WORLD TRADE ORGANIZATION

WORLD TRADE REPORT 2006

Exploring the links between subsidies, trade and the WTO

FOREWORD

The World Trade Report 2006 is the fourth in a series launched in 2002. As in previous years, the present Report has taken up a current issue in trade policy. This year we have looked at subsidies. The contribution we hope to make with these Reports is to aid understanding of complex trade policy issues facing governments. This is not intended primarily as a prescriptive Report, but rather as an invitation to deeper reflection, and it is aimed not just at policy-makers but also the public they represent and the individuals and organizations that actively seek to influence government policies. In addition to the core topic, the Report also takes a brief look at recent developments in trade and discusses some salient features of recent trade developments or a particular aspect of trade. This year, the Report looks briefly at trade in textiles and clothing, flows of international receipts and payments of royalties and license fees, trends in the trade of least-developed countries, and the impact of natural disasters and terrorist acts on international trade flows.

Looking first at trade developments in 2005, aggregate real merchandise trade grew by 6.5 per cent, compared with 9 per cent in 2004. The 2005 figure is still above the average growth rate over the last decade, which amounted to slightly less than 6 per cent. A particular feature of the trade scene last year, persisting into the present, is the higher prices of many primary commodities, especially oil. The implications of this tendency are highly varied among countries, both developed and developing, depending on whether they are engaged in commodity production. Taking developing countries as a group, however, higher commodity prices have contributed to the highest share of world trade accounted for by developing countries in more than five decades. The continued strength of China's merchandise exports (in value terms) has been another element in the strong trade performance of developing countries.

The elimination of quota restrictions on textiles and clothing at the beginning of 2005 does not appear to have had a major impact so far on demand or domestic market conditions in the major importing markets – the United States and the EU. What has perceptibly changed, however, is the composition of market shares among exporting countries. China and India, along with a number of other relatively recent market entrants such as Jordan and Peru, have gained market share, while a number of other countries that benefited previously from preferential market access through quotas now account for lower shares. The quotas have only been off for a little more than a year and one should not be too categorical about how the situation will develop. A complicating factor in the analysis is the reintroduction of restrictions on China's exports. Overall, the changed situation raises a number of questions of a developmental nature that merit closer consideration.

The mini-review on changes in international flows of receipts and payments of royalties and licence fees is a proxy – by no means a perfect proxy – of tendencies in respect of high technology investment and production. Some of the results are unsurprising. Developed countries still dominate transactions in both directions, but we do see growth in the share of payments of royalties and licence fees on the part of a number of Asian countries.

The trade of least-developed countries (LDCs) has done better in the aggregate than in recent years, but the increase in the LDC share of global trade is from a very small base and is still well below 1 per cent. Moreover, we are looking at quite mixed results among the LDCs, with some primary commodity exporters doing very well. Only two LDCs account for 35 per cent of the group's total exports and 13 LDCs account for less that one per cent of the total. Progress was made at the Hong Kong Ministerial Meeting in securing duty-free and quota-free access on at least 97 per cent of LDC exports. Moreover, progress is being made in developing the Aid for Trade initiative, whose beneficiaries will include LDCs.

The last of the short thematic essays in Chapter I of the Report, in discussing the effects of disasters and acts of terrorism on trade, tells us that while these events can take a terrible toll in human suffering and inevitably have an impact on trade, the aggregate trade effects often tend to be small. Particular industries are likely to take the brunt of the adverse trade effects, although in the case of enhanced security measures and restrictions reflecting concern about the risks of terrorism, additional transactions costs can have a more broad-based sectoral impact. Governments continue to work on ways of minimizing the latter costs.

Turning to the core theme of the Report, a good deal of material has been put together on subsidies. How do we define them? What can economic theory tell us about them? Why and in what sectors do governments resort to subsidy practices? And what is the role of the WTO Agreement in regulating subsidies in the context of international trade? The Report seeks to answer these questions.

Subsidies defy easy definition. The narrowest definition would not extend beyond budgetary outlays and the broadest might incorporate virtually any government policy resulting in a change in conditions in the market place. The WTO, notably in the Agreement on Subsidies and Countervailing Measures, embraces an approach that seeks to preserve a level playing field between companies, when governments provide financial support. The Report assesses how far this and other definitions used at the national level help to disentangle policy choices facing governments, facilitating a distinction between subsidy practices that distort resource allocation and those that serve a defensible social or economic purpose.

It is clear from the Report that not much can be said *a priori* about the effectiveness of subsidies when pursuing various domestic policy objectives. Much depends on specific circumstances. Economic analysis shows how a subsidy can help when the market allocation of resources is inconsistent with social objectives. An important contribution of economics in this connection is that we can compare the resource costs of pursuing an objective with the benefits that will flow from attaining the objective. Analysis can also reveal whether a subsidy is the best policy among alternatives.

The Report shows that governments have many reasons for subsidizing, including the pursuit of industrial development, supporting the creation of new knowledge through research and development, attaining distributional objectives among members of society, and protecting the environment. Sometimes governments apply subsidies for less defensible reasons, or at least for reasons more likely to disturb economic relations among countries, such as squeezing a strategic advantage out of trading partners. Other stated reasons for subsidizing may have only a tangential or very remote link with economic considerations, such as promoting national security or protecting cultural diversity. Economics is useful here not so much in judging the objective as identifying the most efficient means of attaining it.

A particular contribution of the Report lies in its effort to collect as much information as possible on what governments actually do by way of subsidization. This information on subsidy incidence has been put together from very diverse sources that make comprehensiveness and comparability difficult. Not surprisingly perhaps, sharp differences exist among countries in terms of what they subsidize – some countries favour agriculture, others industry and services. Some countries want to promote new activities, others want to protect existing ones. Some focus on fostering exports. Many countries subsidize infrastructure and social services.

One lesson from the analysis in the Report that I believe deserves particular attention concerns the extraordinary paucity of reliable and systematic information on subsidies. Even in the WTO, many governments are remiss in meeting their notification obligations. It is simply impossible to make good policy or to forge mutually beneficial international cooperation in the absence of information. This is an issue in pressing need of attention by governments.

Finally, the Report's examination of WTO subsidy rules traces the evolution of provisions over time, with continuing additions of detail and precision, against a background informed by the intricacies of legal disputes. The analysis highlights differing views among the WTO membership as to whether the rules are tight enough to prevent unwarranted trade distortions, or accommodating enough to allow governments to pursue particular objectives they regard as important and legitimate, such as promoting development. No easy answer exists to these questions, but one thing is certain – if the rules are not perceived as serving national interests at the same time as promoting international cooperation, adherence will prove no less elusive than the holy grail. Herein lies the challenge for WTO Members, as in so many other areas of international policy cooperation – how to strike accommodations that truly represent shared interests and ensure mutual benefit.

Pascal Lamy

Director-General

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DISCLAIMER

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ABBREVIATIONS AND SYMBOLS

AGOA	African Growth and Opportunity Act
AMS	Aggregate Measurement of Support
AoA	Agreement on Agriculture
ATC	Agreement on Textiles and Clothing
AWB	Australian Wheat Board
BIS	Bank for International Settlements
BOP	Balance of Payment
c.i.f	cost, insurance and freight
CAFTA	Central American Free Trade Agreement
CAP	Common Agricultural Policy
CBO	Congressional Budget Office
CCC	Commodity Credit Corporation
CFAF	Communauté Française Africaine Franc
CFM	Central Fish Market
CFP	Common Fishery Policy
CGE	Computable General Equilibrium
CIS	Commonwealth and Independent States
CITA	Committee on the Implementation of the Textiles Agreement
CNCAS	Caisse Nationale de Crédit Agricole du Sénégal
CO_2	Carbon Dioxide
CRTC	Canadian Radio-television and Telecommunication Commission
CSE	Consumer Support Estimate
CWB	Canadian Wheat Board
EAGGF	European Agricultural Guidance and Guarantee Fund
EAO	European Audiovisual Observatory
EAS	Essential Air Service
ECU	European Currency Unit
EDB	Environmental Database
EPZs	Export Processing Zones
EU	European Union
EWG	Environmental Working Group
EXIM	Export-Import Bank of the United States
f.o.b	free on board
FAC	Food Aid Convention
FAO	Food and Agricultural Organization
FAOSTAT	Food and Agricultural Organization Statistics Division
FDI	Foreign Direct Investment
FPE	Fonds de Promotion Economique
FY	Financial Year
GAO	General Accounting Office
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GFS	Government Finance Statistics Yearbook
GFT	Government financial transfers
GSSE	General Services Support Estimate
GSTP	Global System of Trade Preferences
GTAP	Global Trade Analysis Project
IEA	Institute of Economic Affairs
IEFR	International Emergency Food Reserve
IMF	International Monetary Fund

IMO	International Maritime Organization
IRCC	Import Rebate Credit Certificates
ISPS	International Ship and Port Facility Security
IT	Information Technology
ITS	International Trade Statistics
LDCs	Least-Developed Countries
MDC	Multimedia Development Corporation
MFI	Microfinance institutions
MFN	Most-Favoured-Nation
MIDP	Motor Industry Development Program
MITI	Ministry of International Trade and Industry
MOU	Memorandum of Understanding
MPS	Market-Price Support
MSC	Malaysian Government's Multimedia Super Corridor
NACC	National Accounts Statistics
NAFTA	North American Free Trade Agreement
NASA	National Aeronautics and Space Administration
NEXI	Nippon Export and Investment Insurance
NTT	Nippon Telephone and Telegraph
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PC	Productivity Commission
PFC	Production Flexibility Contracts
PPP	Purchasing Power Parity
PRPO	Protracted Relief and Recovery Operation
PSE	Producer Subsidy Equivalent
R&D	Research and Development
R&LF	Royalties and Licence Fees
RPA	Rural Payment Agencies
S&D	Special and Differential Treatment
SACE	Servizi Assicurativi del Commercio Estero
SCM	Subsidies and Countervailing Measures
SME	Small and Medium Enterprises
STE	State Trading Enterprises
STIC	Standard International Trade Classification
TPR	Trade Policy Reviews
TRIA	Terrorism Risk Insurance Act
TSE	Total support estimate
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistics Division
US	United States
USF	Universal Service Funds
VLSI	Very Large Scale Integration
WFP	World Food Programme

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
€	euro
Q1,Q2,Q3,Q4	first quarter, second quarter, third quarter, fourth quarter

EXECUTIVE SUMMARY

The World Trade Report 2006 begins with a short summary of salient trends in international trade based on the Secretariat's earlier Report issued in April. We also provide brief analytical commentaries on certain topical trade issues, which this year cover recent trends in trade in textiles and clothing, an examination of the evolution of international royalty and fee payments, developments in the trade of least-developed countries, and an analysis of the effects of natural disasters and acts of terrorism on international trade flows. The core topic for analysis in WTR2006 is subsidies. The Report explores this area of policy in terms of how subsidies are defined, what economic theory can tell us about subsidies, why governments use subsidies, the most prominent sectors in which subsidies are applied, and the role of the WTO Agreement in regulating subsidies in the context of international trade.

I RECENT TRADE DEVELOPMENTS AND SELECTED TRENDS IN TRADE

Trade developments in 2005

The deceleration of global trade expansion observed since mid 2004 was arrested and reversed in the second quarter of 2005. The yearly real growth of world merchandise exports averaged 6 per cent in 2005 after outstandingly strong growth of 9.5 per cent in the preceding year. The largest net-oil-importing developed traders, the EU(25), United States and Japan, recorded a particularly strong slowdown in their import growth. China's imports expanded far less rapidly than in the preceding year, despite a vigorous economy. Regions and countries exporting fuels and other mining products, which benefited strongly from relative price developments, expanded their imports sharply. According to provisional data, the Commonwealth of Independent States (CIS), South and Central America, Africa and the Middle East expanded their imports at least two times faster than world trade.

Large variations of relative prices had a major impact on nominal trade developments in 2005. The prices of fuels and metals rose by about one-third in 2005, while the prices of many agricultural products and manufactures increased only moderately or stagnated. Prices for global merchandise trade increased on average markedly less than in the preceding year, largely due to the deceleration of prices for manufactured goods, which account for about three-quarters of merchandise trade.

The large shifts in relative prices over the last two years lifted the share of fuels in total merchandise trade to a twenty-year high in 2005. At the same time, price developments accentuated the long term downward trend in the share of agricultural products, which fell to a historic record low of less than 8 per cent. In the early 1950s, the share of agricultural products exceeded 40 per cent in world merchandise trade.

World merchandise exports rose 13 per cent and exceeded for the first time the US$10 trillion mark. Oil market developments were the principal factor leading to the sharp rise in the exports of Africa, the CIS and the Middle East. In 2005, Africa and the Middle East recorded their largest share in world merchandise exports since the mid-1980s. Europe, the largest trader among the major geographic regions, recorded by far the weakest export and import growth in 2005. North America's nominal trade growth decelerated moderately and rose roughly in line with global trade. Merchandise trade growth of the Asian region exceeded on average that of global trade, but large variations in export performance could be observed between China and the other leading traders in Asia.

Commercial services exports rose by 11 per cent, to US$2.4 trillion in 2005. This expansion in dollar values was markedly less than in the preceding year, but still somewhat above the average growth of the 2000-05 period. Commercial services trade in Asia expanded faster than the global average, while North America's services lagged slightly behind. Europe's commercial services exports rose by 7 per cent in 2005, less than half the rate in the preceding year. Most of this year-to-year deceleration in Europe's services trade is attributable to exchange rate developments between European currencies and the US dollar over the last two years.

Trends in trade in textiles and clothing

International textiles and clothing trade entered a new phase after the expiry of the Agreement on Textiles and Clothing in 2005. This implies likely long-term structural changes, but overall market conditions did not change much in the EU and the United States in 2005.

The phase out of textiles and clothing quotas is likely to accentuate underlying trends towards the replacement of domestic production in high-income countries by suppliers from lower-income countries, in particular China. However, the removal of quotas had a limited additional impact on textiles and clothing production, employment and price levels in the EU and the United States in 2005. This is explained partly by the fact that the sharply increased imports from some suppliers were partly offset by reduced supplies from the high-income East Asian economies and new export restraints on China's sales into those markets. With the exception of EU clothing output, production declines observed in preceding years continued without any deepening at the aggregate level. The decline of employment in the textiles and clothing industry did not accelerate, and prices of textiles and clothing in the EU and the United States largely remained flat, as in preceding years.

However, shares in sales of textiles and clothing products to the US and EU markets changed in 2005.

Shipments to the EU and the United States by some major suppliers that had benefited from the ATC quota system were partly displaced by increased supplies from other sources, in particular China, India, Turkey and Bulgaria. High income developing economies in East Asia recorded strong double-digit declines in their shipments to both the EU and US markets. While most of the preferential suppliers tended to lose market share, large variations in the development of shipments could be observed. In the US market, suppliers from AGOA and NAFTA recorded strong decreases in their shipments in 2005. Imports from Sub-Saharan Africa, Morocco and Bangladesh to the EU(25) decreased markedly in the first ten months of 2005.

Developments in international royalties and licence fee payments, 1995-2004

The pattern of international receipts and payments of royalties and licence fees has changed somewhat over the last decade. The developed countries remain dominant (albeit with shifting shares) in terms of both receipts and payments, while East Asian countries have become more prominent, in particular on the payments side.

Global receipts (and payments) of royalties and license fees are estimated to have expanded faster than world commercial services exports over the 1995-2004 period, accounting for 5 to 6 per cent of world commercial services trade in 2004. The dominating share of the United States in global royalty and licence fee receipts has decreased as the EU and Japan have expanded their income from this source faster than the United States. Royalty and licence fee payments still take place largely among the developed countries. Japan became a net earner in this services category from 2003, as a result of increased overseas investment.

Royalty and licence fee payments are made largely among affiliated companies. This explains why payments by East Asian economies are relatively strong, reflecting a high level of foreign direct investment and integration into global production networks. Among developing countries, Singapore, China and the Republic of Korea have sharply increased royalty and licence fee payments in recent years. Aggregate payments from these three countries have exceeded those of Japan since 2003. Royalty and licence fee payments by developing countries outside East Asia accounted for less than 4 per cent of global payments in 2004.

Developments in the trade of least-developed countries, 1995-2004

Least-developed countries (LDCs) have increased their share of world trade in recent years, but still account for a very small portion of total trade. Exports are highly concentrated among a few LDCs. Developing countries are importing a growing percentage of LDC exports.

Participation of LDCs in world merchandise trade has increased in absolute terms since 1990, with an especially sharp increase in the past three years. Despite this strong record, LDCs as a group accounted for only 0.6 per cent of world exports and 0.8 per cent of world imports in 2004. The trade profile of LDCs varies considerably across countries. Two LDCs account for 35 per cent of all LDC exports. In contrast, the 13 last-ranked LDCs

in terms of export value accounted for less than 1 per cent of total LDC exports in 2004. Lack of product diversification continues to be a problem for most LDCs.

An interesting development in LDC trade is the gradual reduction in the importance of developed country markets for LDC exports. In 1995 the EU(15) and the United States accounted for almost 60 per cent of total LDC exports. In 2004 this figure dropped to 52 per cent, and China is now the third largest market for LDC exports.

Achieving duty-free and quota-free market access in developed country markets for all products originating from LDCs has long been an aspiration of the international community. Progress is being made in developed countries and some developing countries, but a good deal remains to be done.

To date, the objective of duty-free and quota-free market access for LDCs has yet to be reached, despite the increased impetus arising from the Millennium Development Goals. Based on 2003 data, 27.6 per cent of total LDC exports remain dutiable. Developed countries account for 61 per cent of this total and developing countries for the remaining 39 per cent.

The United States and Japan account for the lion's share of dutiable LDC exports, at 53 per cent and 7 per cent respectively. In the case of Japan, 90 per cent of the dutiable figure is represented by imports of oil, which attract an *ad valorem* equivalent duty of less than 1 per cent. Further analysis of the US situation shows that six LDCs (Bangladesh, Cambodia, Laos, Maldives, Myanmar and Nepal) accounting for 37 per cent of the total imports, also account for 92 per cent of total dutiable imports. Annex F of the Sixth WTO Ministerial Declaration contains a pledge from developed WTO Members to provide duty-free and quota-free market access to LDCs by 2008. If some Members face difficulties in meeting this objective, they have pledged to provide duty-free and quota-free market access for at least 97 per cent of the products in their tariff schedule.

Market access conditions for LDC exports in developing country markets are determined by the profile of MFN tariffs, since only a few developing countries, such as China, provide non-reciprocal market access. Some developing countries have argued for invigorating the Global System of Trade Preferences (GSTP), which envisages trade preferences among developing countries. A new round of GSTP negotiations was launched at UNCTAD XI in Brazil in 2004. The process of carrying these negotiations forward has yet to start.

The impact of natural disasters and terrorist acts on international trade flows

An analysis of the impact of recent natural disasters suggests that while human suffering and localized damage can be very considerable, and the immediate effects on particular industries notable, the economy-wide impact of these events on trade and growth is short-term and generally minimal.

The impact of natural disasters on international trade flows depends on how large the tradable sector is in the devastated area and how integrated it is with the global economy. At the national level, there could be additional indirect effects if macroeconomic activity weakens as a consequence of a disaster. Exports may fall because the physical damage caused by the disaster severely disrupts production in some major export sectors. Production facilities may be shut down, important inputs may be in short supply, major utilities may be disrupted or there could be transportation bottlenecks. However, imports may rise to make up for shortages in local production. And reconstruction efforts may also require significant amounts of foreign goods or services which would tend to increase imports. Overall, the impact of a disaster on international trade will tend to be localized and temporary.

These conclusions seemed to be confirmed by the experience with the Indian Ocean tsunami that occurred in late December 2004 and Hurricane Katrina, which hit the United States in August 2005. The Indian Ocean tsunami badly affected five countries – India, Indonesia, Maldives, Sri Lanka and Thailand – and left hundreds of thousands dead or missing. But the macroeconomic impact has not been discernible. Only in the case of the Maldives, the smallest of the affected countries, is growth expected to decline in 2005 from the pre-tsunami forecast. Merchandise trade has continued to grow in 2005 in four of the most affected countries, and at double-digit rates in some countries.

Although there was initially a lot of concern about the effect on tourism, the latest assessment points to a less gloomy picture. For the first nine months of 2005, international tourism arrivals actually increased in Sri Lanka compared to the same period in 2004. In the case of Thailand, for the first six months of 2005, international tourism arrivals were only down by 6 per cent. Only in the case of the Maldives has the impact been severe. In all these destinations, the main constraint does not appear to be a reluctance of foreign tourists to return to the region. Rather, the pace of reconstruction has lagged the resurgence in demand.

The combined losses of Hurricanes Katrina and Rita are likely to even be larger than the damage wrought by Hurricane Andrew and the 11 September 2001 terrorist attacks. Based on estimates by the US Congressional Budget Office, the value of capital stock destroyed by Katrina and Rita will total between US$70 billion and US$130 billion. But there did not seem to be a discernible impact on US economic growth, which rose to 4.1 per cent in the third quarter, about a full percentage point higher than growth in the second quarter.

One of the immediate concerns was the impact on the energy sector as nearly 2 per cent of global crude oil supply comes from the Gulf of Mexico. Crude oil prices jumped to over US$70 a barrel while gasoline prices in some parts of the United States surged past US$3 dollars a gallon. However, this peak was not sustained and oil prices have drifted downward from their levels in late August and early September. There has been some impact on the volume and value of US petroleum imports but they remain quite small relative to the annual value of US imports.

Terrorist acts tend to affect particular industries, especially tourism, but the effect is generally localized and temporary. Trade costs may rise as a result of concerns about terrorism, but many governments are taking measures to mitigate this effect.

International terrorism appears to be one of the greatest concerns of the international community at present. Besides the immediate losses, the bombings in Madrid, London and Bali particularly affected individual industries, such as tourism and retail, albeit only temporarily. These events do not appear to have had lasting consequences for the countries' overall trade and economic growth.

If terrorist risks persist, transaction costs of international trade will increase, mainly via higher insurance premiums and tightened security measures at borders, ports and airports. The overall impact of a given increase in transactions costs on a country's trade depends on its trade openness, its principal trading partners, the composition of traded goods and services and their respective modes of delivery. For instance, according to one study, value shares of transport and insurance costs may range from about 1 per cent for pharmaceuticals to more than 23 per cent for crude fertilizers. The export of services, such as education, may become more difficult, for instance due to actual or perceived difficulties in obtaining visas.

Following recent terrorist acts, insurance and reinsurance carriers imposed widespread terrorism exclusion clauses. In response to higher premiums and excess demand, a range of private-public terrorism (re-)insurance schemes were created in a number of countries offering more extensive coverage. Ongoing concerns about international terrorism have also led to longer delivery times of traded commodities and to additional costs related to specific security measures, especially in the airline industry and in maritime transport. However, international cooperation to ensure security while minimizing trade impacts has intensified, and numerous initiatives have been taken, such as the creation of computer systems to obtain fast-track clearance in ports.

II SUBSIDIES AND INTERNATIONAL TRADE

Governments use subsidies for many reasons, some easier to understand and defend than others.

Subsidies are applied to build infrastructure, to help struggling industries or foster new ones, to promote research and develop new knowledge, to redistribute income, to help poor consumers, and to meet a range of other policy objectives. Economic analysis tells us that some of these objectives can be addressed most efficiently with subsidies. Theory also tells us that subsidies can distort trade flows if they give an artificial competitive advantage to exporters or import-competing industries. Decisions about what to subsidize often involve technical complexities about which governments lack adequate information. Whether a subsidy is considered a desirable

intervention for correcting a market failure or pursuing a social objective, or as an undesirable trade distortion depends sometimes upon who is making the judgement. But economic analysis ought to be able to help in understanding why subsidies are applied, determining the desirability of subsidies from a welfare perspective, and assessing the merits of alternative forms of intervention. When governments decide to grant subsidies that have little to do with efficiency considerations, economic analysis based on welfare analysis may be of limited use. In such cases, the analysis is probably most helpful in ensuring that policy-makers are aware of the costs of pursuing particular objectives and of alternative, lesser-cost ways of doing so.

From an international trade perspective, concern among trading partners about subsidy practices rises in direct proportion to the extent that such interventions are seen as having specific trade effects in a given sector – that is, subsidies that impart an advantage to beneficiaries which constitutes a competitive threat in an internationally contested market. Whether or not such subsidies could be justified in terms of national welfare, the fact remains that if their trade effects are perceived as being too severe in the marketplace, they will likely attract a reaction that would nullify any value from granting subsidies. The WTO subsidy rules attempt to balance the potential tension between the right to use subsidies and the imperative that such subsidies are not too disruptive or distorting in terms of international trade.

How to define subsidies

Subsidies are notoriously difficult to define. Definitions are typically tailored to specific purposes and they vary considerably in terms of scope.

No common, authoritative definition of a subsidy exists. Subsidies may involve budgetary outlays by governments. They might rely on regulatory interventions with no direct financial implications for the government budget. They could constitute public provision of goods or services at less than market prices. Or they may simply be thought of as the consequence of any government intervention that affects relative prices. Definitions used in the literature and by national and international authorities tend to be determined by the purpose at hand. Most definitions of subsidy, however, entail a transfer from the government to a private entity that is "unrequited" – that is, no equivalent contribution is received in return.

Subsidy definitions often distinguish between categories of recipients, such as producers and consumers, or nationals and foreigners as recipients. Subsidy programmes might also limit subsidization to certain subgroups within these categories. The more narrowly defined the group of (potential) beneficiaries, the more "specific" a subsidy programme is considered to be. Subsidy programs with a wide range of (potential) beneficiaries, instead, are often referred to as "general" subsidies.

The most complete standardized information on subsidies is provided in national accounts statistics for which country data are available worldwide. The national accounts statistics define subsidies in a rather narrow way, including only direct payments to resident enterprises. Other popular data sources define subsidies more broadly. This is the case, for example, for the "producer subsidy equivalent" (PSE) measure developed by the OECD to quantify domestic support to agricultural producers. The WTO Agreement on Subsidies and Countervailing Measures defines a subsidy to include a public financial contribution that confers a benefit to the recipient. The basic element of most subsidy definitions – an unrequited transfer by government – is thus contained in the WTO definition. The WTO definition takes a broad approach in respect of possible forms of subsidy, including direct payments, tax concessions, contingent liabilities and the purchase and provision of goods and services (with the exception of the provision of general infrastructure). The definition excludes regulatory measures or other policies, like border protection, that do not consist of government resource transfers. Another key feature of the WTO subsidy definition is the notion of "specificity", i.e, only subsidies with a limited beneficiary set are subject to the WTO subsidy rules.

Economic analysis of subsidies

Economic analysis helps us to disentangle the various effects that subsidies may have on beneficiaries, non-beneficiaries and the economy as a whole. In particular, the analysis helps us to understand the effects of subsidies on trading partners.

Under the simplifying assumption of perfect markets, where no market imperfections or market failures are present, it is easy to show that like most other interventions, a subsidy carries net welfare costs and is undesirable from the perspective of the country providing the subsidy. When market distortions exist, as they generally do in the real world, subsidies might be justified on certain grounds. The Report examines two types of market failure – economies of scale and positive production externalities – and illustrates how governments can use subsidies to improve domestic welfare. However, the Report also recognizes that decisions on subsidies may wholly or partly reflect the response of elected officials to the demands of various interest groups, whose political support may be crucial for political success.

The magnitude and nature of the trade effects of subsidies depends in part upon whether or not the subsidizing country is large enough to affect the world price. If this is not so, quantities in the market will change but not prices. Production subsidies to import competing industries result in a contraction of world trade volumes as imports are displaced by domestic production. In contrast, export subsidies will expand world trade as more domestic production is sold on the world market. If the subsidizing country is large enough both policies will tend to result in a price decline. Although this is not necessarily the case when governments support industries characterized by economies of scale (e.g. R&D intensive industries). Subsidies in such cases may lead to excessive entry, resulting in increased consumer prices because producers cannot produce at a sufficiently large scale.

Government may intervene via taxes and subsidies when the market allocation of resources is not consistent with predefined social objectives. In this case, the resource cost of the intervention needs to be balanced against the achievement of the predefined objective. Sometimes a subsidy can be shown to be the least resource-cost instrument available. For example, a tariff could be used to achieve a specified output objective by raising domestic prices and inducing producers in the protected market to increase output. Domestic consumers would suffer a welfare loss because of higher prices in the local market. If instead of a tariff, a production subsidy were provided to domestic producers, domestic output would increase, but domestic consumers would not have to pay a higher price.

Why governments subsidize

Among the policy objectives for which governments have applied subsidies are industrial development, innovation and strategic promotion of industries, adjustment to changed economic circumstances, redistribution of income or purchasing power, environmental protection, and certain non-economic objectives. The Report discusses these objectives in terms of alternative policy approaches and in relation to economic efficiency and other considerations.

Industrial development

Subsidies aimed at promoting industrial development might be justified because of poorly functioning markets in relation to information barriers and coordination problems.

Policy makers in developing countries often consider subsidies to be a useful tool to develop certain industries, with industries in this context referring to activities in the agriculture, industry or services sectors. This development objective has often been linked to the so-called infant-industry argument, i.e. the view that in the presence of more developed countries, less developed countries cannot develop new industries without state intervention. While informational barriers to market entry and learning "spillovers" among producers underlie the most familiar variant of the classic infant-industry argument, information problems faced by consumers and lenders in capital markets have also provided arguments for interventions in support of infant industries. Coordination problems can arise in the presence of interdependent investments related to vertical linkages in production, large scale economies and restrictions to trade.

The theoretical case for government subsidization in the presence of knowledge spillovers that arise from learning-by-doing is fairly straightforward. The controversy over this variant of the infant-industry argument centres on empirical and practical matters. While learning-by-doing or knowledge spillovers are often assumed to be pervasive, available evidence is relatively scarce and does not provide a very clear picture. The small

existing body of work on the estimation of learning effects suggests that the importance of such spillovers is likely to differ between industries.

Recent theoretical and empirical research on industrial development policy has focused on a market failure related to informational externalities in the entrepreneurial process of discovering new profitable investment opportunities. In the presence of such informational externalities, laissez-faire leads to underprovision of "discovery" and governments need to encourage investment in new activities *ex-ante*, but impose discipline and stop unproductive activities *ex-post*. A comparison of various types of interventions suggests that trade protection is not an efficient way of promoting self-discovery while subsidies and government loans and guarantees have benefits and costs.

The prevalence of informational asymmetries in capital markets has been used to justify government interventions in those markets and, in particular, credit subsidies. The arguments here are not straightforward. Governments may not be in a position to correct the failures when it is difficult if not impossible to identify the appropriate intervention *ex-ante*. Subsidies can only be shown to be efficiency-enhancing under specific assumptions regarding the precise nature of information asymmetries. Under alternative assumptions, the appropriate intervention can be shown to be an interest rate tax.

When it comes to coordination failures that affect economic decision-making, a subsidy is not the best policy because all the relevant investments, if they are made, will be profitable. The purpose of the government's intervention in this context is to ensure that all the desirable interrelated investments are indeed made. This can be achieved through pure coordination or perhaps through *ex-ante* subsidy schemes.

Much of the discussion regarding the merits of industrial development policies has focused on the administrative and fiscal feasibility of government interventions, their informational requirements, and their political economy consequences. Economists typically agree on the theoretical case for government intervention in the presence of certain market failures. There is some disagreement regarding the empirical relevance of the cases that have been identified. However, there is a clear divergence of views on the feasibility issue. While mainstream economists tend to consider that selective interventions require a considerable amount of information and skills, other economists argue that such problems should not be exaggerated. They believe that good decision making by governments necessarily involves making mistakes.

Export promotion policies are seen by many as preferable to import substitution policies in the pursuit of industrial development.

A survey of the industrial policy literature indicates that from the point of view of implementation, export promotion has some advantages compared to import substitution. The first is that chances to pick an industry where the country has a comparative advantage are better. The second is that the costs of subsidies, which show up in budgets, are more transparent than those of tariffs. A third argument is that export performance is a criterion not too amenable to rigging by firms or their bureaucratic counterparts.

A particular form of export support is the use of export processing zones. Export processing zones (EPZs) have been established over decades and today significant shares of developing countries' manufactured exports originate in EPZs. An EPZ refers to one or more areas of a country where barriers to trade are reduced and other incentives are created in order to attract foreign investors. The incentives provided differ in nature and can change over time, but many or most take the form of fiscal measures – tax reductions or exemptions rather than cash. Whether EPZs represent a cost-efficient policy instrument to pursue industrial development is highly questionable. While many observers agree that some examples of successful EPZs exist, there are certainly also examples of EPZs creating distortions that are harmful to an economy.

Some political economy literature suggests that a rules-based policy regime which entails high degrees of pre-commitment reduces the costs associated with discretionary behaviour by government officials, that predictable policies help direct the private sector in the desired direction, and that policies that create rents also create rent seekers. For some economists, the "public choice" literature tends to conclude that policy

interventions should be avoided and the role of the government should be minimized. Others would argue that government capabilities can be improved, that the degree of selectivity can be adapted to the level of capabilities and that governments can be helped to intervene efficiently.

Empirical research is not conclusive on many issues surrounding industrial development policy, leaving room for competing interpretations of how successful such policies have been and what other factors have contributed to successful industrial development.

The experiences of East Asian economies with industrial policy, and whether these might teach any lessons to other developing countries, figure prominently in the debate about the role of government intervention in industrial development policy. Early explanations of the growth performance of the Republic of Korea and Chinese Taipei emphasized the importance of "getting the fundamentals right" and outward orientation with few price distortions. In the 1980s, however, several scholars pointed out that these two, the Republic of Korea and Chinese Taipei, had also used selective interventions, such as incentives to individual sectors, restrictions on trade and inward foreign direct investment, and tight control of the financial sector.

In 1993, in a report entitled "The East Asian Miracle", the World Bank proposed a compromise interpretation. It acknowledged the importance both of managing the economic fundamentals effectively and pursuing export-push strategies. Partly catalyzed by this work, an enormous amount of empirical research on the effect of selective industrial policy has since been conducted. One interpretation of the evidence is that on balance, the results indicate that industrial policy made a minor contribution to growth in Asia. Another interpretation is that industrial policies have played a role in most non-traditional export success stories in East Asia.

Supporting the production of "knowledge" goods

Governments use subsidies to support research and development that creates new knowledge in order to capture the positive spillovers inherent to knowledge creation.

The private sector is unlikely to invest as much in research and development (R&D) as would be desirable from a national standpoint for two reasons. First, if large investments in R&D are a prerequisite of production in an industry where economies of scale are present, production may not be profitable for a private company but nevertheless beneficial from a social perspective. Empirical research confirms the relevance of this argument in practice. It has been shown that consumer benefits from major new innovations have been quite large in comparison to the research costs borne by the innovators.

Second, R&D support can be justified on the grounds that knowledge has public-good characteristics that make it likely the social benefits of new knowledge exceed the benefits that a private sector investor in R&D would be able to appropriate. In other words, R&D may well generate positive externalities and governments may need to supplement resources devoted to creating knowledge. Economists only have a partial understanding of the precise nature of R&D spillovers and no consensus exists on the most appropriate kind of policy intervention in this area.

An alternative approach to capturing the spillover effects of R&D is to grant firms temporary monopolies through the intellectual property system. But governments may still be justified in directly supporting some R&D expenditure.

Rather than seeking ways of directly subsidizing R&D, the intellectual property rights system is usually relied upon by governments to encourage firms to invest in knowledge creation. A patent, for example, guarantees its owner the sole use of a patented invention during a specified period. This conferred monopoly right ensures higher returns on investments made in creating knowledge. Once the patent expires the underlying knowledge can be used by others. To a large extent, the length of the period of patent protection will determine whether an appropriate balance has been struck between encouraging investment in R&D and allowing society to benefit from R&D-generated knowledge spillovers. In the global economy, an intellectual property protection regime needs to be international to maintain the incentives for R&D investments.

An intellectual property regime may not internalize all knowledge spillovers, implying that investment in R&D could still be too low from society's perspective. This situation might occur where scale economies are sufficiently large to make the magnitude of the initial investment too large to be undertaken by individual enterprises. High initial fixed costs may, therefore, provide a reason for governments to subsidize R&D activities notwithstanding the existence of an intellectual property protection setup.

The economic literature does not provide a unanimous answer on the question whether general R&D policies are preferable to R&D policies that target certain industries or geographical areas.

Governments that decide to support R&D face the difficult question of how to do so. In particular they need to decide whether R&D support should have a general or specific character. The literature is not unanimous on this point. There is some agreement, however, that location and proximity matter in exploiting knowledge spillovers. As a result, many governments have in recent years encouraged the creation of regional innovation clusters as a means to stimulate innovation. Only a limited number of such clusters have been successful, suggesting the difficulty of designing successful clusters from scratch. General R&D policies that aim at raising the economy-wide level of research expertise have the advantage that there is no need for governments to "pick" or "recognize" winners and that they are less prone to capture.

Strategic trade policy

Another reason why governments may subsidize firms is to secure a national advantage in leading industries characterized by economies of scale. This may, for instance, occur in R&D intensive industries.

R&D intensity and other entry costs lead to economies of scale in production processes. The industries concerned are frequently characterized by imperfect competition, which might induce governments to use subsidies to shift rents or pursue other strategic policies. The use of subsidy programmes in support of "national champions" that are considered to be of particular value for the relevant economy is a frequent phenomenon and is often observed in R&D intensive sectors. Such policies are likely to be hurtful to trading partners that are themselves active in the relevant industry. On the other hand, they may be beneficial for trading partners that only import the relevant service or good, as increased competition may lower consumer prices. Given the nature of strategic subsidy schemes, the risk of government capture is particularly high. The more governments enter into competition, the more likely that funds end up being dissipated in excessive entry, possibly leading to consumer prices that are higher than necessary, as none of the supported companies can produce at an efficient scale.

Distribution

In terms of standard economic analysis, an inequitable distribution of income does not represent a market failure so such analysis is likely to be of limited use in establishing why governments might use subsidies to change the distribution of income in society.

Governments almost everywhere regard redistributive polices as part of their responsibility and will often use instruments such as subsidies to promote greater equality. Economic analysis inevitably gives way to moral, philosophical, sociological, historical and psychological discourse in this area.

Income redistribution policies will carry certain costs for society, arising from the adverse effects of income transfers on incentives and from the administrative costs of transfer programmes. High marginal tax rates can reduce the incentive for saving, risk-taking and entrepreneurship. Generous social programs can dull incentives to participate in the labour market. The rich may also be tempted to engage in socially wasteful activities to avoid taxes. If economic analysis has little to say about the desirable distribution of income in society, it is nevertheless useful in considering these costs against the benefits assigned to more income equality.

Governments can achieve their redistributional goals through a host of instruments. The traditional ones include a progressive income taxation system, social security and public health insurance. But these are not the only available levers of policy. A part of government spending on public education, public housing, and public services can also be classified as social expenditures because they encompass the objective of improving economic conditions and opportunities for parts of the population.

Social expenditures are a significant share of national income in developed countries.

In developed countries, what can be termed social expenditures comprise a significant share of government spending and of GDP. In 2001, OECD members spent an average of 21.2 per cent of GDP on social programmes, though not all of this spending can be classified as subsidies. These social expenditures cover programmes for old age, survivors, incapacity-related benefits, health, family, active labour market programmes, unemployment, regional policies, housing, water, and access to telecommunications services. Several of these aspects of social spending are discussed in the Report.

Outside these traditional areas of social expenditures, governments often justify subsidies to agriculture as necessary to support farm income. Similarly, subsidies to declining industries may be justified on income distribution grounds. Financial aid to the coal industry in the EU, for example, is regarded as compatible with the proper functioning of the common market if it helps solve social and regional problems created by falling production. Support to declining industries can either aim at facilitating the downscaling of production or at raising competitiveness of the ailing industry. If unsuccessful the latter strategy can lead to significant costs for society.

The cost of implementation of subsidy programmes can be reduced by better targeting of beneficiaries (greater specificity) and incorporation of market discipline.

In some of the examples of redistributive policies taken up in this Report, there is a discussion also of how it may be possible to lessen the associated costs of subsidies through better targeting or through the incorporation of market discipline in their use.

Environmental protection

As concern has grown about environmental degradation, so have policy interventions designed to address the problem.

Economic growth over the last decades has increased concern about environmental degradation, including deforestation, global warming, reduced bio-diversity, air pollution, depletion of the ozone layer, and over-fishing. This concern has led to a range of environmental agreements, laws and regulations, and additional resource flows aimed at addressing environmental problems, including through subsidies. The sources of environmental challenges can be pinned down to market failures, such as the existence of positive or negative externalities that are not taken into account in private production and consumption decisions, the fact that certain natural resources have a public good character, and the existence of information asymmetries between producers and consumers in regard to the environmental characteristics of products or production processes. Each of these eventualities would justify government intervention.

Governments often face complex decisions about how best to address environmental issues.

This, of course, raises the possibility that governments may err in their choice of intervention. In general, economists would argue that the best policy instrument would be the one that addresses the source of the problem as close to its source and in as precise a fashion as possible. But other factors such as the socio-economic level of development will also influence the decision. Policy instruments available to governments for dealing with market failures that have adverse environmental consequences include economic incentives such as tariffs, taxes, tradable permits and subsidies, administrative instruments such as laws, regulations and prescribed standards, and investments in the dissemination of information. In regard to economic instruments, subsidies can be designed to internalize either negative or positive externalities, to facilitate adjustment to new environmental regulations, and to correct information asymmetries. However, the desirability of a subsidy relative to alternative instruments depends on a range of factors.

For example, economists tend to regard taxes and subsidies as very similar instruments, but in this context an emission tax may be better than a subsidy for each unit of emission reduced because a tax would not expand an environmentally damaging activity. In general it may be difficult to identify the precise level of a tax or subsidy required to attain a given environmental objective. This is why regulations (although economically

inefficient) may be preferred to fiscal instruments – regulations can set precise *ex ante* targets. Similarly, regulations may be preferred to information campaigns with less certain outcomes. Tradable permits are often considered the best policy instrument, because they combine certainty of the outcome and least costs. But, tradable permits too have drawbacks: they can be used for strategic competition.

The international character of some environmental problems adds to the complexity of choosing the right policies.

Where environmental problems are international and not local in nature, other factors come into play. Air pollution and acid rain, for example, transcend national boundaries. International spillovers can only be effectively addressed through international cooperation. Here, however, questions arise such as who should pay, what instruments should be applied, and whether all parties to an international agreement should observe the same environmental standards.

Other policy objectives

Subsidies are sometimes provided in the name of national security, non-trade concerns or cultural heritage and diversity and other non-trade concerns. Such objectives transcend narrow economic maximization concepts and tend to carry particular implications for specific industries.

Some public policy objectives already discussed are impossible to analyse solely in terms of their economic consequences. This is also true of interventions in the name of national security, cultural heritage and diversity and other non-trade concerns. Such objectives transcend narrow economic maximization objectives. They are generally considered as objectives that are crucial to the identity of a nation, even if they have a specific sectoral focus. However, choices among policies to pursue these objectives can have significant implications in terms of economic efficiency.

Sectors in which national security considerations figure prominently include food and energy production. In economic terms, one could argue that a market failure arises on account of divergence between private and public perceptions of risk. While the actual level of security desired is a political decision that goes far beyond economic analysis, the latter is useful in gauging the relative economic costs of fostering additional domestic production for security purposes as opposed to holding stocks, diversifying foreign sources of supply and investing in foreign production in the sectors concerned.

The non-trade concerns most widely discussed in the WTO context relate to agriculture and the alleged grounds for subsidies and similar measures aimed at increasing commodity production. The term multi-functionality is also used in this connection. The argument is that agricultural production is a process of joint production where not only commodities such as food and fibre are produced, but also "non-commodities" that exhibit the characteristics of positive externalities and public goods. Examples of such non-commodities include landscape, cultural heritage values, biodiversity, rural employment, food security and animal welfare. A source of some debate is the question whether the production of these "goods" can only be secured through additional agricultural commodity production, or whether in some instances other, less-cost policy interventions could attain the same objectives.

The protection of cultural heritage and promotion of cultural diversity are considered by several countries to be a public policy objective. A debate exists over whether trade liberalization represents a menace to cultural heritage and diversity. Some argue that trade liberalization in cultural products erodes national identities and narrows individual choices. Others argue that trade in cultural products enhances individual choices. Across the world a number of different instruments have been used to achieve the objective of maintaining cultural heritage and diversity. Among these are restrictions on market access, the imposition of domestic content requirements and subsidies. From an efficiency and effectiveness perspective, subsidies often turn out to be a superior instrument in this domain.

The incidence of subsidies

Comprehensive information on the use of subsidies is hard to come by, either because governments do not systematically provide the information or because multiple data sources use different definitions and classification systems.

Although there are a number of sources from which information on subsidies can be obtained, definitions and classifications differ in most cases and are difficult to reconcile. Data from international sources that allow for cross-country comparability either only exist at a highly aggregated level, or are available for a limited number of (sub)sectors, e.g. fisheries and agriculture, or instruments, e.g. export credit support. For other sectors, like services, and government support to the establishment or maintenance of EPZs, no international data source exists which would provide quantitative information that is comparable across countries.

To provide more pieces to the puzzle, three types of additional sources have been used: national and supranational subsidy reports, information from WTO notifications under the SCM Agreement and the AoA and information from the WTO's Trade Policy Review reports. National subsidy reports provide quantitative information that is likely to be comprehensive and accurate but does not guarantee cross country comparability. WTO notifications contain quantitative information. Compiling and analysing this information is, however, difficult as the information has not been provided according to clear and consistent statistical definitions. The information contained in Trade Policy reports is mostly descriptive, and has been reported in this section mainly for illustrative reasons.

Aggregate data covering several decades suggest that subsidy levels have differed significantly among developed countries, and also over time within countries. Developing countries use subsidies less on average than developed countries as a proportion of their national income.

Available information indicates that 21 developed countries spent nearly US$250 billion in 2003 on subsidies. The total for the world was more than US$300 billion in that year. The average ratio of subsidies to GDP among developed countries was higher in the 1970s and 1980s than either the 1960s or the 1990s. In the EU(15), Norway, Canada and Japan the ratio decreased markedly in the 1990s and the 2000-04 period compared to levels in the 1970s and 1980s. For the United States, the ratio of subsidies to GDP was rather stable over time. Over the entire 1960-2004 period, the level of subsidies (as measured by the NACC) in the United States was about one half of a per cent of GDP, which was lower than in the other developed countries. The European countries report a much higher subsidy level while Japan takes an intermediate position between the United States and the EU. Canada's subsidy level has been rather close to the EU level while those of Norway and Switzerland exceed the EU level.

It is often assumed, seemingly correctly, that subsidy levels are lower in developing countries than in developed countries. On the basis of National Accounts data for the years 1998 through 2002, the share of subsidies to total government expenditure and to GDP in developing countries seems to have been lower than for developed countries. For a sample of 22 developed and 31 developing countries, it was found that the average ratio of subsidies to GDP for the period was 0.6 per cent for the developing countries – less than half the rate observed for the sample of developed countries (1.4 per cent). The difference between the developing and developed countries is also pronounced for the ratio of subsidies to government expenditure (4.4 per cent and 8.2 per cent respectively).

Sectoral data show high variance among countries.

Given the present data situation, it is impossible to come up with an estimate of the sectoral breakdown of global subsidies. Also at the country level only rough indications can be obtained on the sectoral distribution of subsidies, and this only for a limited number of countries. The first observation which can be made is that the available data point to a large variation in the sectoral distribution of subsidies among countries.

For Colombia and Brazil the data show a low share of agriculture (less than 20 per cent) and a high share for services (more than 50 per cent). In India, however, the data point to a very large share of agricultural subsidies (more than 50 per cent), followed by industry (about one-fifth) and services (about one-eighth). In

the EU, the distribution of subsidies among industries differ substantially at the Member state level (excluding the subsidies provided by the EU directly which are focussed on agriculture and fisheries). According to the EU scoreboard data, overall state aid provided by member countries is concentrated on the industry sector (more than two-thirds in 2003). Information from the Annual Review of Trade and Assistance by the Australian Productivity Commission indicates that Australian subsidies go largely to the industrial sector, one-quarter to agriculture and one-fifth to services.

Subsidy notifications to the WTO are a potentially useful source of information but the data contain many gaps and shortcomings.

Mandated notifications by WTO Members under the Agreement on Subsidies and Countervailing Measures are another potential source of useful information on subsidies. In principle these data cover industrial and agricultural subsidies. But the data have significant shortcomings. First, not all Members fulfil the notification requirements at the expected intervals. In most years, information is available for less than half of the WTO Membership. Second, the information provided by Members is not necessarily complete in each year. Third, many notifications contain limited quantitative information on subsidy programmes. The information from WTO notifications provided in this Report should be read with extreme caution.

Comparing the data on subsidies from various sources for the period 1998-2002 reveals not only large discrepancies but also raises questions about the completeness of WTO Member notifications. For the United States, the reported annual average value for the four-year period is US$16.3 billion, less than half the value reported in national accounts (US$41.5 billion, federal subsidies only). In Japan the notifications report US$4.2 billion of subsidies while in the national accounts US$34.3 billion are reported. Australia notifies to the WTO subsidies of US$0.3 billion while in its NACC they rise to US$4.7 billion. For the EU(15), the notifications amount to US$96.3 billion (Community and individual members combined) which are not so far off the NACC data which report US$109 billion and the EU Scoreboard (which excludes EU subsidies) of US$80.3 billion. As indicated above, the exclusion of services in the notification requirements and the absence of quantifications of many subsidy programmes in the notifications are an important element in these discrepancies.

Agriculture

Data from the WTO and the OECD, while far from complete and not entirely comparable, allow a picture to be drawn of the magnitude and trends of subsidies in the agricultural sector.

Two main sources of information on agricultural subsidies are used in the Report. These are the notifications made by WTO Members to the WTO Committee on Agriculture and the OECD's agricultural database, particularly its Producer Support Estimate (PSE). The aggregate measurement of support (AMS) used in the context of the WTO Agreement on Agriculture is a measure of domestic support subject to reduction commitments. These are the most trade-distorting measures. Nevertheless, a *de minimis* level of product-specific and non-product specific domestic support may be retained. In addition, a range of support measures are not considered trade-distorting (or only to a minimal extent) and hence are exempted from reduction commitments. These include Green Box Measures, Blue Box Measures and Article 6.2 Measures (S&D Box Measures).

A sample of data from WTO notifications on domestic support point to a reduction over time in support levels and particularly in the most trade-distorting forms of support.

Notifications by WTO Members tend to lag by several years, making it difficult to provide the latest information on Total Current AMS. Furthermore, not all Members have notified every year since 1995. In order to avoid problems with the comparability of the data series over time, the Report relies on a panel of 21 WTO members who have reported their Total Current AMS without interruption from 1995 to 2001. The cut-off year of 2001 was chosen because that was the latest year in which there is data on the three Members (European Communities, US, and Japan) with the highest levels of Total Current AMS.

For these 21 Members, Total Bound AMS has fallen by an average of 7.2 per year over the 1995-2001 period. But Total Current AMS has been reduced at a far sharper rate of 10.3 per cent per annum. Actual levels of trade-distorting support (Total Current AMS) has been reduced by nearly half, from US$115.1 billion in 1995 to

US$60.1 billion in 2001. Although there is only a commitment to reduce bound AMS, other components of domestic support have also been decreased, although by a slower rate. Over the 1995-2001 period, there has been an annual average reduction of 6.9 per cent on blue box spending, 5.7 per cent on Article 6.2 measures, and 2.6 per cent on green box measures. The only component of domestic support which has increased over the six year period is *de minimis,* which nearly tripled in amount, from US$ 3.8 billion in 1995 to US$ 9.6 billion in 2001.

The bulk of domestic support is provided by three Members – the EU, the United States and Japan. During the 1995-2001 period, the EU spent an average of US$96.1 billion on domestic support, followed by the United States with US$66.2 billion and then Japan with US$41.8 billion. After the top three Members, the amount provided by others trails off very quickly. The fourth largest provider of support, the Republic of Korea, averaged US$7.5 billion. While seven of the top ten providers of support are OECD members, three are not – Brazil, Thailand and Cuba.

The AMS estimates also allow us to make some assessment of the distribution of support by commodities. Information from notifications made in 2001 indicates that the bulk of product-specific AMS was concentrated in meat and livestock (23 per cent of AMS), milk and dairy products (19 per cent of AMS), fruits and vegetables (13 per cent of AMS), cereals (12 per cent of AMS), sugar (12 per cent of AMS), and vegetable oils and oilseeds (10 per cent).

WTO notifications suggest that export subsidies, like domestic support, have seen substantial cuts in recent years. The EU and other European countries are the major users of export subsidies that require notification in the WTO. Other non-notifiable export subsidy mechanisms such as export credits and guarantees, as well as food aid and state-trading should also be taken into account.

Turning to export subsidies, notifications suggest that the EU is the dominant provider of such support, accounting for close to 90 per cent on average of notified outlays. However, export subsidies as a share of agricultural output are much larger in Switzerland and Norway (hovering around 4-6 per cent and 3-5 per cent respectively of total production) than in the EU (1-2 per cent). At a total of some US$3 billion in 2000 (down from about US$7 billion in 1995), export subsidy spending is small compared to domestic support outlays, which amounted to approximately US$200 billion in the same year. At about 17 per cent annually on average, budgetary outlays in dollar terms declined more than commitment levels, which only shrank by approximately 14 per cent. Sugar, various dairy products and meat (notably beef) are the most heavily subsidized exports.

Other forms of export subsidies that need not be notified, such as export credits, export credit guarantees or insurance programmes, as well as state-trading enterprises and food aid can be of considerable importance for certain Members and, therefore, are part of the export competition pillar in the Doha negotiations. According to the OECD, the export subsidy equivalent of export credits is most pronounced for the United States, Australia, Canada and a number of European Union member countries. However, publicly available data on short- and medium-term export credits are very sketchy. The United States, a major user of export credit guarantees, has published data showing that between 1995 and 2002, around US$3 billion was spent on average per year, corresponding to between 5 per cent and 6 per cent of total agricultural exports and to about 2 per cent of output.

A major concern with exporting state-trading enterprises, especially if granted single desk status, i.e. the exclusive right to purchase and sell in the domestic market as well as export markets, relates to the exercise of market power. Hidden export subsidies may be given through a combination of price discrimination between domestic and export markets and price pooling after all sales have been effected. At a lower internal price, domestic sales can be expected to contract, while more is produced at a higher pooled price and absorbed into increased exports. However, the question whether state-trading enterprises indeed subsidize exports is not easily answered and much depends on the market structure that would replace a state-trading enterprise after its hypothetical elimination. Additional complications arise when state-trading enterprises enjoy other forms of government financing, such as discounts on transportation and storage rates, preferential exchange rates, interest rates and the like, that are not available to private traders. A specific privilege has sometimes been the underwriting of losses by the government, leading to more aggressive pricing strategies by state-trading enterprises and, as a result, higher exports.

Food aid may be considered an export subsidy if it leads to the displacement of commercial suppliers. Emergency aid is unlikely to have such effects, since it is targeted at additional consumption. Besides emergency relief, properly targeted food aid could also provide an insurance function in regions where other mechanisms such as food markets, stock-holding and household strategies fail. The proper distinction between bona fide food aid and subsidized in-kind food transfers for the purpose of surplus disposal has been a source of contention. WTO Members have decided to develop effective disciplines on in-kind food aid, monetization (i.e. food sold in the recipient country to provide budgetary support to the local government) and re-exports in order to prevent loop-holes for continuing export subsidization.

OECD data largely confirm observed trends in the reduction of trade-distorting agricultural support.

Although OECD data are not easily comparable with information generated in the context of the WTO negotiations, these data can provide useful corroboration of patterns of subsidization revealed by the AMS and total domestic support estimates. Over the past 20 years, the nominal value of PSEs in the agricultural sector of OECD countries has not changed much, varying between US$230 billion to US$280 billion. If the nominal values are adjusted to real values, the data reveal a decline in support to agriculture over the last two decades. If one considers the magnitude of support as a share of agricultural production, there has been a decline from 39 per cent in 1986 to 30 per cent in 2004, although fluctuations have occurred during the period.

Three components of the PSE can be distinguished. These are market price support, payments based on either output or inputs, and other payments (payments based on area planted/animal numbers, historical entitlements, input constraints, overall farming income and miscellaneous factors). The first two categories arguably give the greatest incentives to expand production. Market price support declined from 77 per cent to 60 per cent of the PSE from 1986 to 2004. Payments based on output and input use remained fairly constant as a share of PSE, at about 14 per cent. The share of "other payments", which is less distorting than the first two, rose from 10 per cent in 1986 to 26 per cent in 2004.

Economic simulation models suggest that agricultural subsidies create a welfare loss and that this is borne primarily by the major providers of subsidies. Owing to their highly trade-distortive effect, some trading partners benefit from the removal of export subsidies, but net food importers may be hurt.

Economic simulation models could be used to examine how subsidies affect other market participants (producers and consumers) beyond the original beneficiaries. Despite the variety of modelling approaches employed, a number of common conclusions have emerged from this research. First, the provision of agricultural support creates a welfare loss and the bulk of this loss is incurred by those countries who are the major providers of subsidies. Second, there are spillover effects on world markets. Support in rich countries tend to depress world market prices of the most subsidized agricultural commodities. This benefits some trade partners but hurts others as well. Net food and agricultural importers benefit from the support provided in rich countries as this tends to lower the cost of their food and agricultural imports. Net exporters of agricultural goods are penalized as they lose market share in third markets or receive prices in world markets that are lower than what would have been the case without the support. Finally, the elimination of agricultural subsidies in OECD countries would generate welfare gains for the entire world although, according to one study, the gains are almost ten times smaller than the benefits flowing from complete removal of agricultural tariffs.

Recent directions in agriculture support policies, combined with advances at the Sixth Ministerial Conference in Hong Kong, suggest that despite the difficulties ahead and contested views about the appropriate pace of change, trends towards the reduction of trade-distorting agricultural policies are a cause for some optimism.

Thus, both the WTO and the OECD data point to a decline over time in the most production-distorting and trade-distorting forms of agricultural support. The trends in domestic support and export subsidies that have been observed in this Report and the agreements reached at the Hong Kong Ministerial Conference, particularly on export subsidies, provide grounds for optimism that despite the difficulties and challenges ahead, the reduction

in the most trade-distorting support in the agricultural sector will not only continue in the future but perhaps even accelerate. In Hong Kong, Members agreed on the elimination of all forms of export subsidies by the end of 2013 and disciplines on all export measures with equivalent effect to be completed by the same date.

Industry

Once again systematic data are non-existent. Reliable sources of information on industrial subsidies are scarce and mostly incomplete.

Over the period 1995 to 2002, a total of 54 economies (including the European Communities and its Member States) notified quantitative information on industrial and/or horizontal subsidies to the WTO under the SCM notifications requirement. The median value of the industrial subsidies to GDP ratio for this sample is 0.2 per cent but data suggest considerable diversity among Members in terms of their use of industrial subsidies.

The Australian Productivity Commission's Trade and Assistance Review provides an interesting and comprehensive survey of Australian subsidies, which complements the information in the notifications. It shows that Australian budgetary assistance to industry expressed as a share of GDP decreased from 0.37 per cent to 0.30 per cent between fiscal years 1999-2000 and 2003-2004. This same source shows that assistance provided by tariffs to the manufacturing sector was more than four times larger than budgetary assistance to this same sector.

Total state aid provided by EU-15 Members, less aid to agriculture, fisheries and transport, decreased substantially between the mid-90s (1995-1997) and the end of the decade. Since then, the ratio of subsidies to GDP has remained stable. Despite some convergence between new Members and EU-15 States, state aid data show that differences in industrial subsidy practices among EU Members remain significant. These state aid figures do not include subsidies granted by the EU, which accounted for about two-thirds of the Community budget in 1998. Among major recipients of these funds were the agriculture and fisheries sectors.

A majority of countries notified more horizontal than industry-specific subsidies in 2002 and there is evidence suggesting that aid is being progressively redirected toward horizontal objectives in Europe and Latin America.

Among the richer countries, the European Communities notified six times more industry-specific than horizontal subsidies, while the United States notified seven times more horizontal than industry-specific subsidies. In line with commitments undertaken at various European Councils, EU-15 Member States have been redirecting aid towards horizontal objectives. In the new Member States, the share of pre-accession aid to horizontal objectives was relatively low because of the strong support to several industries including coal, steel and the financial sector in the context of privatization, or to ensure viability. Figures for 2004 show that the share of horizontal aid has increased substantially in the new Member States.

Australian budgetary assistance statistics for 2002-03 show that industry-specific measures accounted for 44 per cent of total budgetary assistance, R&D accounted for 28 per cent and general export measures accounted for 15 per cent. Tax exemptions under the Automotive Competitiveness and Investment Scheme were the single most important industry-specific budgetary assistance program.

Evidence from Latin America and the Caribbean countries show that in the late 1980s and 1990s a transition occurred from industrial policies associated with the import substitution model to industrial policies suitable for outwards-oriented economies. Measures such as EPZs, grants and fiscal incentives aimed at promoting technological modernization, and policies to promote SME development replaced traditional direct subsidies and fiscal incentives.

In sectoral terms, mining, coal, steel, forestry, fishing, shipbuilding and the automotive industries appear to be among the major recipients of subsidies.

Australian Government budgetary assistance varies markedly between sectors, with the largest proportion directed to the manufacturing sector. The motor vehicles and parts industry receives the largest share of

assistance, both in absolute terms and relative to the sector's gross value added. Other important beneficiaries of subsidies include the textiles and clothing industry, metal product manufacturing and petroleum, coal, chemicals and associated products.

Available information on state aid for EU Members does not provide an accurate picture of the final recipients of the aid. Data nevertheless show that the distribution of state aid across sectors varies considerably among Member States. Eight countries provide state aid to the coal industry which accounts for most of industry-specific aid in the EU-15, but only for one-third in the new Member States. The share of manufacturing (including processed food) in total state aid varies between 13 per cent in the case of Portugal and 98 per cent in the case of Slovakia. State aid to fisheries never exceeds 3 per cent of total state aid, as support to fisheries is mainly provided through EC structural funds. The amount of state aid to the shipbuilding sector declined by half between 1999-2001 and 2001-2003. Two of the ten new Members provide aid to the automotive sector while four provide aid to the steel sector.

Evidence suggests that in Latin America and the Caribbean, the specific sectors that benefit from loans or tax incentives include mainly primary industries and in particular forestry and mining, and cultural industries such as publishing, printing or newspapers.

Fisheries

Subsidies to fishing are large and stable in most countries engaged in subsidization, but environmental protection has tended to figure more prominently as a stated objective of fishing subsidies in recent years.

Subsidies to the fishing industry worldwide are estimated at between US$14 billion and US$20 billion in 1996, representing around 20 per cent to 25 per cent of world revenues. Different data sources are not directly comparable. Despite this limitation, certain conclusions may be drawn. OECD countries typically receive some US$6 billion a year in transfers from the government, representing 20 per cent of the landed value. About 40 per cent of this total is provided by Japan, followed by the United States and the EU, representing around 15 per cent each. Among EU countries, Finland appears to provide the largest subsidies as a share of landed value. A substantial share of global fishery subsidies is accounted for by Canada, Republic of Korea, Russia, Indonesia and Chinese Taipei.

Little information is available on fisheries subsidies provided by developing countries. A recent study by UNEP reveals, however, that fishery subsidies do exist in developing countries and may also be important, as the case of Senegal.

All available data sources suggest that the level of fisheries subsidies has remained substantially unchanged over time. However, stated policy objectives do appear to have changed. These objectives include the provision of research and management services for sustainable fisheries, fleet modernization, regional development, and income support. The recent trend, especially in developed countries, is to shift the emphasis toward environmental protection. Some evidence of a move toward environmental objectives is also present in developing countries. For example, although total fishery subsidies in Cape Verde remained substantially unchanged between 1999 and 2000, there was a fall in subsidies for ice purchase and an increase in decommissioning grants.

Coal

Available evidence suggests that many but not all major coal-producing countries subsidize their industries quite heavily. In a number of cases, however, subsidies are being directed more towards adjustment and less towards merely maintaining the industry.

No comprehensive public database exists on coal subsidies. The International Energy Agency collects and publishes detailed information on coal production, consumption, trade, and prices for all its Members but it does not collect information on subsidies. Our overview suggests that many coal producing countries, developed and developing, grant subsidies to their coal industry. In a number of cases, however, the nature of

the subsidies and their objectives have changed. Moreover, many countries have reduced their subsidies in the last decade. On the other hand, available evidence suggests that a number of major coal producers, including China, the US, India and Australia, do not directly subsidize their coal industries.

Coal has played a crucial role in the process of industrial development in numerous countries. Some governments subsidized the coal sector to promote industrial development and energy security. In some regions, however, the strategic importance of coal decreased with the diversification of energy sources and the competitiveness of the domestic coal industry was progressively eroded. Because of the historical and social importance of coal-mining activities to local economic activity and employment, governments sometimes intervened heavily to support the coal industry. Such interventions often prevented necessary adjustments from taking place.

In a number of countries, the heavy cost of subsidies induced governments to force the coal industry to embark on substantial restructuring measures, sometimes involving major cutbacks in activity. Restructuring of the coal sector has taken place in India, Mongolia, Romania, Russia, Ukraine, Japan, Republic of Korea, Turkey and several EU Member countries.

While one of the objectives of restructuring is usually to reduce subsidies, it typically involves granting some other forms of aid. Evidence for the European Union shows that while operating aid was cut by about half over the period 1994 to 2000, other types of aid increased substantially. While the social and regional function of coal aid programmes has been recognized, their cost-effectiveness has been questioned. According to the European Commission, in 2000 the annual sums paid per worker in aid to current production were appreciably higher than the average wages of the workers concerned.

Services

International sources of data on the incidence of subsidies in the services sector is practically non-existent. Available sources suggest that support is concentrated in the transport, tourism, banking, telecommunication and audiovisual sectors.

Most available services data comes from national sources, rendering cross-country comparisons difficult. One useful, if incomplete, source of international data on subsidies to services is the WTO's Trade Policy Reviews (TPR). Information contained in the TPR reports issued between 1995 and February 2004 suggests that subsidies are found in many service sectors, but mainly in transport, tourism, banking, telecommunication and audiovisual. These are the sectors on which the analysis of services subsidies focuses in this report.

While such data is not comprehensive and has significant limitations that impede drawing too many inferences, it suggests, regarding the types of measures used that developed countries tend to use with more frequency direct grants and preferential credit and guarantee arrangements, while in developing countries tax incentives, duty free inputs and free zones appear to be more common.

Transport services

Subsidies to transport services are generally aimed at ensuring universal service access, although environmental considerations and security concerns have also played a part in recent years. Stated objectives and the type of instrument used differ across modes of transport.

The case for public support to transport services is generally made in terms of the desirability of universal access. However, a number of other policy goals are also declared by governments as justification for the subsidies provided. For example, an important reason behind the subsidization of some specific modes of transport, such as subsidies to rail transport, is that of pursuing environmental goals.

EU state aid data show that aid to the transport sector represents the largest share of total EU state aid. In 2001, 46 per cent of state aid was granted to the transport sector. The largest share of state aid in the EU is granted to railways transport, including for environmental reasons. From 1998 subsidies to the air transport sector have dropped. A reversal of the downward trend in air transport subsidies has been recorded recently (2001-2003), following the special support measures taken after 11 September 2001.

Differences also emerge as to the type of subsidy used across various modes of transport. For example, in the EU while tax incentives and direct grants make up the whole amount of state aid in the case of railways, road and maritime transport subsidies, subsidies to air transport are provided in the form of equity participation.

Telecommunications

Universal service obligations figure prominently in support to telecommunications services, although the means of intervention vary among countries.

The importance of direct subsidies for universal telephone services has declined worldwide. The financing of universal service obligations is increasingly carried out in many countries through Universal Service Funds (USF). In general, these funds are financed by a tax on telecommunication operators, general tax funds or the sale of resources (such as privatization) or the sale of licences. In developing countries, USF are often financed through both government subsidies and operator levies. Among Latin American countries, Chile and El Salvador provide universal services funds almost entirely through government subsidies.

An important difference exists between developed and developing countries in the use of universal service funds. While in developing countries, USF resources focus on ensuring the affordability of the services, in developing countries universal access policy focuses on guaranteeing the availability of the service, including through developing telecommunications infrastructure.

Tourism

Subsidies to the tourism sector are widespread, particularly but not exclusively in developing countries. While subsidies are primarily development-focused in the latter countries, in developed countries they tend to be more concerned with other considerations, such as regional conditions and small and medium enterprises.

Tourism is one of the sectors most frequently targeted by services subsidies according to the information collected from TPR reports. Subsidy programmes for tourism were mentioned in 62 of the 97 Members reviewed in TPR reports between 1995 and February 2004.

In many developing countries, subsidy programmes for tourism are explicitly mentioned in relation to the nation's development strategy. Also in industrialized countries tourism subsidies are frequently intended to be a development tool, although they tend to be used for regional development in those countries. While subsidies for the development of tourism related infrastructure play a significant role in developing countries, support of the tourism industry is more likely to take the form of marketing support or support to small and medium enterprises in industrialized countries.

Financial Services

Government intervention in financial services frequently aims at keeping ailing banks afloat or at restructuring the banking sector.

Information collected from TPR reports reveals that governments from all regions provide assistance to the banking sector in order either to keep ailing banks afloat or restructure the banking sector. Support to restructuring the sector in the context of privatization has been reported frequently for Members in Eastern and Central Europe and Latin America. Support for adjusting to international standards of capital ratios or for merging banks is repeatedly put forward as a reason for intervention in countries in Europe and Asia. Asian countries appear more often among those that explicitly mention the promotion of off-shore banking as one of the objectives for subsidies to the financial sector. Support for start-up financial institutions, for investments in micro-financing and promotion of foreign direct investments is concentrated among African countries.

In terms of the subsidy instruments used, TPR reports indicate that subsidies to the financial sector in the form of equity injections appear more concentrated in Asia and Western Europe, while tax incentives are relatively more frequent among African and Caribbean countries.

Audiovisual

The main characteristic of subsidy programmes in the audiovisual sector appears to be the promotion of certain domestic content and the pursuing of cultural objectives. But, for many countries subsidies are only one of an array of policy instruments.

Subsidies are a tool commonly used in many countries in the pursuit of cultural objectives, often to encourage the production of domestic content, especially in the film and television industry. Other instruments often used include domestic content quotas, foreign equity participation or public broadcasting. Available national data on audiovisual subsides appear to indicate that subsidies to the audiovisual sector represent a significant percentage of overall services subsidies in developed countries and that they have been increasing over time.

Subsidies and the WTO

The GATT/WTO subsidy rules have undergone significant transformation over the years, with changes generally in the direction of making the rules stricter and more precise.

Early rules on subsidies relied on notifications and consultation to ensure that subsidies did not cause serious prejudice to the interests of trading partners. Additional disciplines were then introduced for some GATT Members on export subsidies in the mid-1950s, particularly those affecting non-primary products, which were subject to a phased-in prohibition. Asymmetry in the treatment of export subsidies on agricultural and non-agricultural products has persisted to the present day. The Tokyo Round Agreement on subsidies introduced more detailed rules, particularly on nationally-applied trade remedies (countervailing duties), and also codified the prohibition on export subsidies on non-agricultural goods. The Agreement applied only to those GATT Members who signed it.

The Uruguay Round Agreement on Subsidies and Countervailing Measures was a major step forward in rule-making. A definition of subsidies was introduced, along with the concept of specificity. The new Agreement applied to all Members, with far-reaching consequences for many countries that hitherto had effectively been exempt from most subsidy disciplines.

The Uruguay Round Agreement on Subsidies and Countervailing Measures introduced a definition of subsidies that essentially rests on the notion of a financial contribution by government that confers a benefit upon the recipient. This definition avoids confusion over more broad-based notions of what might constitute a subsidy and recognizes the reality that other trade rules exist in the WTO that could be argued to have a "subsidy-like" effect (e.g. import tariffs). The concept of specificity is also crucial in definitional terms, since particular forms of specificity (export contingency and contingency on use of domestic goods) attract the strictest discipline (prohibition), while non-specific subsidies fall outside the scope of the WTO subsidy rules. Specificity in the general sense is deemed to exist where access to the subsidy is explicitly limited to a particular set of beneficiaries. Subsidies in respect of which access is based on objective criteria and neutral conditions, which are strictly respected, are defined as non-specific. Government support for general infrastructure, for example, is excluded from the WTO definition of subsidies.

The approach in the legal texts towards "specificity" reflects the expectation that subsidies carry the potential to be more trade distorting the more specific they are. Indeed, in economic terms the more closely targeted a subsidy towards its intended beneficiaries, the more concentrated its relative price effect will tend to be. In many circumstances, this could be taken to imply a higher probability that the subsidy is distorting. A subsidy to a single industry, for example, rather than to many industries could impart a narrow advantage. The more broadly based subsidy recipients are defined, then, the more "spread out" and shallower will be the likely subsidy impact.

On the other hand, the preceding discussions in this Report have shown that governments may wish to target subsidies as precisely as possible in order to correct for given market failures while avoiding undesired side-effects. At the first glance, there appears to be a conflict. Yet, the concepts of "targeting" and "specificity" are not identical. Subsidy programmes can be targeted while basing eligibility on objective criteria and neutral conditions. Such programmes would not be considered specific. Also specific subsidy programmes can only be challenged under WTO law if they cause adverse effects to the interests of other Members.

With the "Single Undertaking" of the Uruguay Round, many developing countries faced new subsidy disciplines, making the special and differential treatment (S&D) provisions of the new Agreement on Subsidies and Countervailing Measures of particular importance. The S&D provisions of the Agreement allow certain developing countries to apply export subsidies to non-agricultural goods subject to transition rules, specify higher nullification, impairment and injury standards for multilateral actions against subsidized developing country exports, and include special thresholds for subsidy levels and trade levels below which countervailing duty actions cannot be taken in respect of developing Members' exports. Developing countries are also exempted from anti-subsidy actions in respect of debt forgiveness, subsidies to cover social costs and liability transfer when these are associated with privatization. The Agreement also contains a provision for extension of the transition period for the elimination by developing Members of their export subsidies. In 2001, Members adopted a set of special producers for use of this extension provision by certain developing Members, in respect of certain of their export subsidy programmes, with a view to providing these Members with more security and stability particularly in respect of their investment incentives. Twenty Members have taken advantage of these procedures to prolong their right to use certain export subsidies. Most of these measures relate to export processing zones (EPZs).

The Uruguay Round Agreement on Subsidies and Countervailing Measures also introduced clarifications in regard to anti-subsidy remedies.

Two kinds of remedies are envisaged against specific subsidies – a unilateral and a multilateral one. The unilateral remedy consists in the application of countervailing duty. Countervailing duties may be imposed on a subsidized product up to the estimated amount of the subsidy, provided the subsidization causes or threatens material injury to an established domestic industry or materially retards the establishment of a domestic industry. Changes to the rules in the Uruguay Round Agreement were mostly of a procedural nature, relating to such matters as the elaboration of the requirements of an investigation, the calculation of the value of subsidy margins, the existence or threat of injury, and the establishment of causal links between subsidization and its effects on domestic industries. The multilateral remedy involves dispute settlement.

The design of the countervailing duty remedy seeks to balance national consumer and producer interests. More generally, the existence of subsidy remedies is likely to restrain subsidy practices.

From the consumer's perspective a countervailing duty, like an anti-dumping duty, raises import prices and represents a cost. For producers, countervailing duties offer an additional margin to raise domestic prices. The standard argument to justify such a countervailing duty would turn on the presence of an externality or market failure. Strategic considerations may also enter the picture if a foreign competitor is being aided by a government to sell below cost in order to eliminate competition from production in the importing country. It should be noted that if a subsidy is countervailed in the importing country, this is equivalent to the subsidy-granting country making an unrequited financial transfer to a foreign government. In general, the potentially inhibiting effect of anti-subsidy remedies can mean more or less welfare in both exporting and importing countries, and the welfare effects may or may not go in opposite directions for the exporting and importing countries.

The Agreement on Agriculture specifies different rules for subsidies on agricultural exports.

The subsidy provisions in agriculture differ from those applying to non-agricultural products in two important ways. First, the Agreement on Agriculture envisages reduction commitments on both domestic support measures and export subsidies. These commitments are conceptually comparable to the commitments traditionally made in negotiating rounds on import tariffs and have no counterpart in the non-agricultural sector, nor for that matter in the services area. Second, the reduction commitments on export subsidies underlie the reality that unlike subsidies on manufactures, the original efforts at disciplining agriculture protection did not contemplate the possibility of eliminating export subsidies. At the Sixth WTO Ministerial Meeting held in Hong Kong in December 2005, however, Members agreed to eliminate export subsidies in agriculture by 2013. This will have the effect of establishing parity in the treatment of export subsidies on manufactures and agricultural products.

The Agreement also has a range of S&D provisions, involving lesser liberalization commitments and higher *de minimis* thresholds. Least-developed countries are exempted from making any trade liberalization commitments. Developing countries have been anxious to ensure that a situation of high dependency on agriculture is not complicated in any way by liberalization commitments and have therefore been emphasizing the desire for flexibilities in commitments.

The General Agreement on Trade in Services (GATS) adopts a different approach to subsidies.

The General Agreement on Trade in Services (GATS) has adopted a very different approach to subsidy disciplines than that found on the goods side. Subsidies, like other measures affecting trade in services, are subject to the obligations of the Agreement, notably national treatment (Article XVII) and most-favoured nation treatment (Article II). While it does not prevent the granting of subsidies, the national treatment obligation disciplines the use of discriminatory subsidies in sectors where commitments are taken and where no relevant limitations are scheduled. As such, it arguably can impose some restraint on the ability of governments to subsidize. In practice, however, many Members have inscribed national treatment limitations in their schedules of specific commitments allowing them to use discriminatory subsidies in certain or all sectors.

Article XV of the GATS contains a negotiating mandate on subsidies, with a view to developing the necessary disciplines to avoid trade distortive effects that subsidies may, in certain circumstances, have on trade in services. The mandate specifies that Members shall address the appropriateness of countervailing procedures, that the role of subsidies in relation to development programmes of developing countries shall be recognized, and that the need for flexibility, particularly for developing country Members, shall be taken into account. These negotiations, which are ongoing in the Working Party on GATS Rules, have not progressed significantly since they began 1995. In addition, concerns have mounted over the widespread disregard of the obligation contained in Article XV calling on Members to exchange information on services subsidies. The Hong Kong Ministerial Declaration (Annex C, paragraph 4(c)) calls on Members to intensify their efforts to expedite and fulfil the information exchange required for the purpose of the negotiations under Article XV of the GATS.

Complex issues underlie the question whether developing countries should, under certain conditions, be permitted to continue to apply subsidies to manufactured exports.

Export subsidies on non-agricultural goods are prohibited by the Agreement on Subsidies and Countervailing Measures, but S&D provisions allow specified developing countries meeting certain economic criteria, including a maximum per capita income threshold, to continue to use such subsidies until they no longer meet these criteria. Other developing countries continue to press for this right. Standard analysis based on perfect competition assumptions concludes that export subsidies only confer costs on the subsidizing country. But if the perfect market assumption is relaxed and the possibility of dynamic externalities is allowed (e.g. an infant industry with higher private than social learning-by-doing costs), then the case for a welfare-increasing production subsidy which for implementation purposes is conditioned on export performance criteria may be constructed. An "infant marketing" case can also be made. On the other hand, such subsidies can be significantly distorting, thus contributing little or nothing to development. In addition, subsidies may attract nullifying remedial action by trading partners which turns financial outlays into wasted resources. Subsidy competition among countries may also occur.

Although the literature supports the idea that export promotion strategies have advantages over import substitution policies, a good deal of empirical literature suggests that export subsidies have not been a common element in stories of successful economic diversification and industrialization in developing countries. On the contrary, subsidy outlays have been wasted and the policy has carried additional economic costs such as rent-seeking domestically and rent transfers to powerful companies that bid up benefits in exchange for location decisions. On the other hand, a strand of empirical literature points to some success in the case of export processing zones (EPZs), which seemingly have contributed in some cases to job creation, income generation and positive spillovers to the domestic economy (such as the transfer of entrepreneurial skills).

The design of EPZs tends to reflect a combination of policy instruments, not all of which are equally trade-distorting. Nor are all of these instruments necessarily subsidies, or export subsidies, in the WTO sense of these terms. The provision of adequate infrastructure, reliable institutions and minimal bureaucratic red tape in EPZs have the characteristics of so-called functional policies that are generally considered as market friendly interventions in the literature. Duty and tariff reductions for companies based in EPZs share characteristics of so-called "permissive policies", i.e. policies aimed at removing distortions created by policies that deter exporting or more generally the development of new activities. Ideally developing countries would want to employ these particular functional and permissive policies in the entire economy, but it may in practice be difficult to do so at a particular level of development. Some observers, therefore, consider EPZs to be useful stepping stones towards a fully open and integrated economy. Other policies applied in EPZs are instead likely to introduce new distortions. This is, for instance, likely to be the case for tax exemptions or direct financial transfers to companies located in the zones. Such policies have often been used to attract FDI, with very mixed results.

It has also been argued in the literature that the existence of EPZs may create a protectionist bias in the long-run, as companies based in an EPZ have no incentive to lobby for further liberalization. In order to determine the degree of S&D warranted in this area, it would therefore be useful to consider whether EPZs are a step towards further economy-wide reforms or whether they reduce the need to liberalize the rest of the economy. Efforts to make subsidy practices WTO-consistent will tend to minimize trade distortions. Export subsidization in the context of EPZs or by other means should be undertaken against very strong cautions about the dangers of destructive subsidization. Governments need to confront the real risk that they might espouse subsidy polices that contribute nothing to development, waste resources, and compromise development opportunities.

I RECENT TRADE DEVELOPMENTS AND SELECTED TRENDS IN TRADE

A RECENT TRENDS IN INTERNATIONAL TRADE

1. INTRODUCTION: TRADE AND OUTPUT GREW LESS RAPIDLY IN 2005 THAN IN THE PRECEDING YEAR

The world economy expanded by 3.3 per cent in 2005, less rapidly than in 2004, but still slightly faster than the decade average. Economic growth remained strong in most regions although less buoyant than in the preceding year. Only Europe's economy continued to record low GDP growth – less than half the rate observed in North America. In contrast to Europe, Japan experienced a strengthening of economic activity. In light of slower economic growth worldwide in 2005 and of oil market developments, merchandise trade growth – like GDP growth – decelerated in real terms, but still exceeded the average for the last decade.

The trade deceleration was most pronounced in the developed, oil-importing regions. Real merchandise imports of the United States, the European Union (25) and Japan grew at half the 2004 rate in 2005 and less than the global average. Most of the developing regions and the Commonwealth of Independent States (CIS) recorded real import growth rates above the global average and in excess of their export growth. Oil price increases are a significant part of the explanation for this performance in many of the countries concerned.

Sharply higher crude oil prices pushed up energy costs worldwide but did not trigger a marked rise in consumer prices as it happened in the previous two major oil crisis in 1973/75 and 1979/81. Several factors contributed to this outcome. First, many developed countries today have a lower oil intensity of output than three decades ago, as the services sector accounts for a larger part of GDP. Second, the slack in production capacity combined with moderate wage increases in many developed regions lowered the possibility of passing on higher energy costs to consumers. Core consumer price inflation – that is all items excluding energy and food – decreased in the euro area and the United States and stagnated in Japan in 2005.[1]

The maintenance of moderate consumer price inflation occurred in a policy environment in which monetary and fiscal policy continued to be stimulative. In a number of countries, however, inflationary tendencies could be observed in house prices and perhaps also in the stock market. The sharp rise in gold prices, to a 24 year peak level, might be also driven in part by demand from investors looking to hedge their assets against inflation.

Fiscal deficits in major developed economies remained high in 2005. Although the United States reduced somewhat its public sector deficit to GDP ratio, at 3.5 per cent it was still larger than that of the euro area. Japan's fiscal deficit, the largest among the major developed countries, stagnated at 6.5 per cent of GDP in 2005.

The further increase in the US current account deficit, to a new peak level in absolute (US$805 billion) and relative terms (6.5 per cent of GDP) was financed without any strains on international capital markets. Oil market developments contributed significantly to the widening of the US external imbalance, while the impact of exchange rate developments were mixed. The moderate rise in US interest rates and the (at least temporarily) increased demand for dollars linked to higher oil prices led to an appreciation of the US dollar against the yen, the euro and the pound in the course of 2005. Against a trade weighted group of seven major currencies, the US dollar depreciated 2 per cent on a yearly average basis in 2005, but it appreciated 7 per cent from December 2004 to December 2005.[2] On balance, exchange rate developments in 2005 did not contribute to a reduction of the core element of the global imbalances, which are found in the trade flows between the United States and East Asia. In late 2005 and early 2006, most trade and price indicators point to a further widening in the United States current account deficit in the coming year.

One of the most challenging questions in the current global economic situation is for how long the increase in the United States current account deficit can continue. Most observers agree that it would be preferable if existing imbalances could be stabilized and gradually reduced, as this would smoothen the inevitable adjustment process. A further rise in global external imbalances may be increasing the risk of a sudden

1 OECD, Main Economic Indicators.

2 US Department of Commerce, BEA, News Release March 14, 2006.

disruptive reduction in the imbalances. Such an abrupt adjustment, accompanied by large exchange rate variations would be more painful and generate larger welfare losses than a more gradual adjustment. In a scenario with disruptive adjustments, protectionist pressures are likely to increase, which if translated into restrictive measures would also have a negative affect on global economic activity.

2. TRADE AND OUTPUT GROWTH IN 2005

As already noted, despite an acceleration of global economic activity and trade in the course of the year, annual average changes in world output and trade were lower than in the preceding year although higher that the decade's average. World economic output of goods and services is estimated to have expanded by 3.3 per cent and real merchandise exports rose by 6 per cent in 2005 (Table 1). The year-to-year deceleration of global economic output and trade was rather close to the predictions made in early 2005. However, at the more disaggregated level the actual outcome deviated from projections, but the impact of these deviations on output and trade tended to offset each other. The negative impact of higher than predicted oil prices on global output and trade in 2005 was partly offset by more resilience than expected to the oil price hikes, illustrated, for example, by the stronger than projected economic activity in Japan.

Table 1
World trade and output developments, 2002-05
(At constant prices, annual percentage change)

	2002	2003	2004	2005
Merchandise exports	3.5	5.0	9.5	6.0
Merchandise production	0.8	3.5	4.0	...
GDP at market exchange rates	1.7	2.6	4.0	3.1
GDP at PPP	3.0	4.0	5.1	4.3

Source: WTO; IMF, World Economic Outlook.

A regional breakdown of the world economy reveals that the sluggishness of the European economy constituted the major drag on world trade and output growth as Europe continued to report the weakest trade and output expansion of all regions. The four largest economies in Europe (Germany, France, the United Kingdom and Italy) all recorded GDP growth below 2 per cent, while the new Members of the European Union continued to grow faster than the old Members, with a combined GDP growth up by 4 per cent in 2005.

North America's GDP growth of 3.4 per cent continued to exceed slightly global economic growth (measured at market exchange rates). Within the region, the US economy recorded the strongest growth.

Economic growth in the developing regions remained robust in 2005, though somewhat less dynamic than in the preceding year. In South and Central America (including the Caribbean), Africa and the Middle East, GDP growth averaged between 4 and 5 per cent. For each region these growth rates in 2005 exceeded their respective short-term (2000-05) and the medium term (1995-05) growth performance. Developing Asia did not escape the global trend to more moderate growth in 2005. However, with regional GDP growth up by 6.5 per cent, developing Asia again recorded the highest growth of all developing regions. China and India, the two countries with the largest populations in the world, again reported outstandingly high GDP growth in 2005 – at 9.9 per cent and 7.1 per cent respectively.

The strongest economic growth of all regions in 2005 was reported by the Commonwealth of Independent States (CIS). Substantial gains from sharply higher export earnings stimulated public and private expenditure and led to GDP growth of 6.6 per cent in 2005, twice the global average. Since the financial crisis of 1998, the annual economic growth of the region exceeded that of the world economy and averaged at nearly 7 per cent over this six-year period. The marked expansion in the output of the region's energy sector contributed much to this development.

Developments in the world energy markets not only impacted on regional economic growth, but also shaped global trade flows.[3] The most visible sign of the change in global energy markets is the substantial rise in fuel prices and, in particular, the price of crude oil since 2003. These price developments are caused by major shifts in global oil demand. Following the recession of 2001/02, a strong increase in global oil demand could be observed. Robust economic growth in the United States and vigorous energy-intensive growth in major emerging economies (especially China) were key factors.[4] Strong oil demand in the US economy led to a sharp rise in its oil imports, as domestic crude oil production continued to shrink. The strength of oil demand in many emerging markets was underpinned by the high energy intensity of this growth. Recently, oil demand has been artificially sustained in some of these markets as end user prices were not fully adjusted to reflect the rise of energy prices in international markets.

High global oil demand growth quickly absorbed the existing excess oil extraction capacity, located mainly in the Middle East. Production capacity problems were not limited to the production of crude oil but occurred also at the refinery level. Even a doubling of oil prices between 2003 and 2005 did not lead to a significant increase in global oil production capacity. The low short-term price elasticity of oil supplies is due to the fact that additions of new capacity require an increase in drilling activities and investments in oilfield developments which need a lead time of several years before production capacity goes up. In addition, declining yields in operational oilfields have been observed in the United States and the North Sea. Investment plans in new oilfields might also have been delayed due to oil price volatility over the past few years.

Exceptional temporary factors also contributed to oil price developments in 2005. Hurricanes in the Gulf of Mexico (especially Rita and Katrina) damaged oil industry installations in the region and according to OECD estimates, led to the temporary closure of 3 per cent of global oil production capacity and 2 per cent of the world's oil refinery capacity.[5] The repercussions of this severe disruption in production, refining and distribution could be contained by releasing oil from the strategic petroleum reserves and OPEC's offer to make all its spare production capacity available to meet market demand.

What have been the major consequences of these oil market developments for output on trade? The further sharp rise in oil prices in 2005 occurred at a time of generally low inflation. This meant that changes in the nominal price of oil were reflected in higher real and relative prices. Chart 1 illustrates this situation. Prices of fuels and other mining products in each of the three economies depicted in Chart 1 rose by more than one-third, while the import prices of agricultural and manufactured goods nearly stagnated or increased moderately in 2005.

The negative impact of the oil price hike on world economic growth has so far been less far-reaching than observed in the past and predicted by most model simulations.[6] Four explanations can be offered for this more benign outcome: first, the recent oil price hikes originate from the strength of oil demand and not from a disruption of oil supplies, which is considered to be less damaging to economic activity. A second factor is the reduced oil-intensity of GDP growth in OECD countries caused by efficiency improvements in energy use and a shift in output towards services, which are less energy intensive than other sectors. This was not fully taken into account in the simulations. The third proposition is that the oil exporters spend their increased export earnings faster on imports of goods and services than in previous oil crises. Finally, it is suggested that the oil exporters have invested their increased net wealth in US corporate and government bonds, and not in more liquid assets, which has helped to limit the rise in long-term interest rates and thereby sustained investment and consumption.[7]

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3 For a more detailed review of oil market developments see IEA, World Energy Outlook.

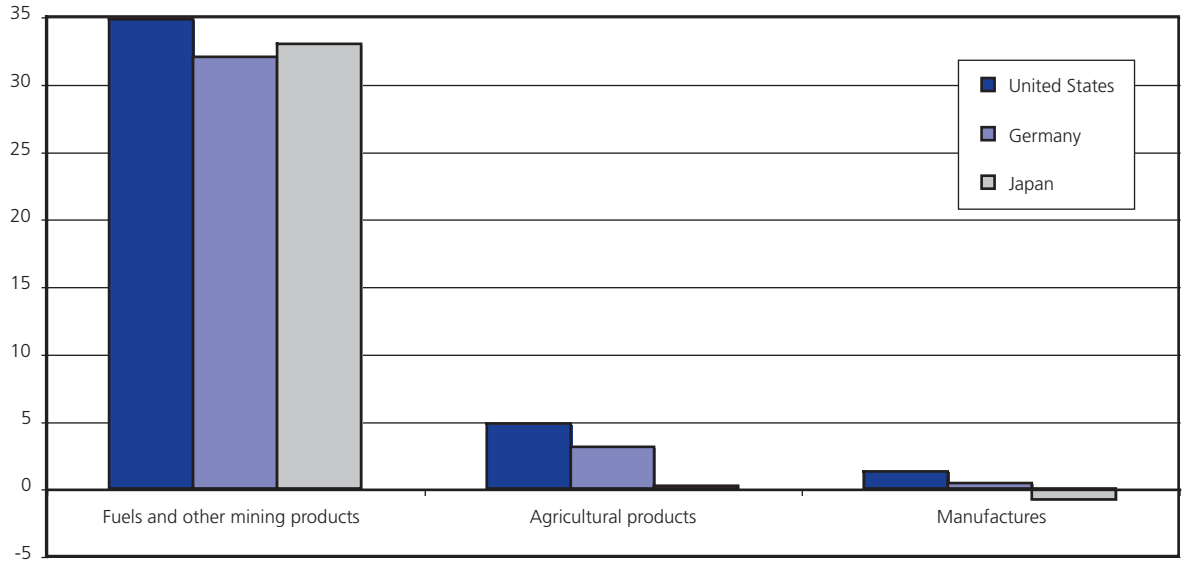
4 International Energy Agency, Oil Market Report. A monthly oil market and stocks assessment.

5 Calculations provided in OECD, OECD Economic Outlook, December 2005 p.6.

6 IMF (2000) *The impact of higher oil prices on the global economy*; IEA (2004) *Analysis of the impact of high oil prices on the global economy in IEA, Energy Prices and Taxes*, 2nd quarter 2004 and IMF (2003) World Economic Outlook, April 2003.

7 OECD, OECD Economic Outlook, December 2005.

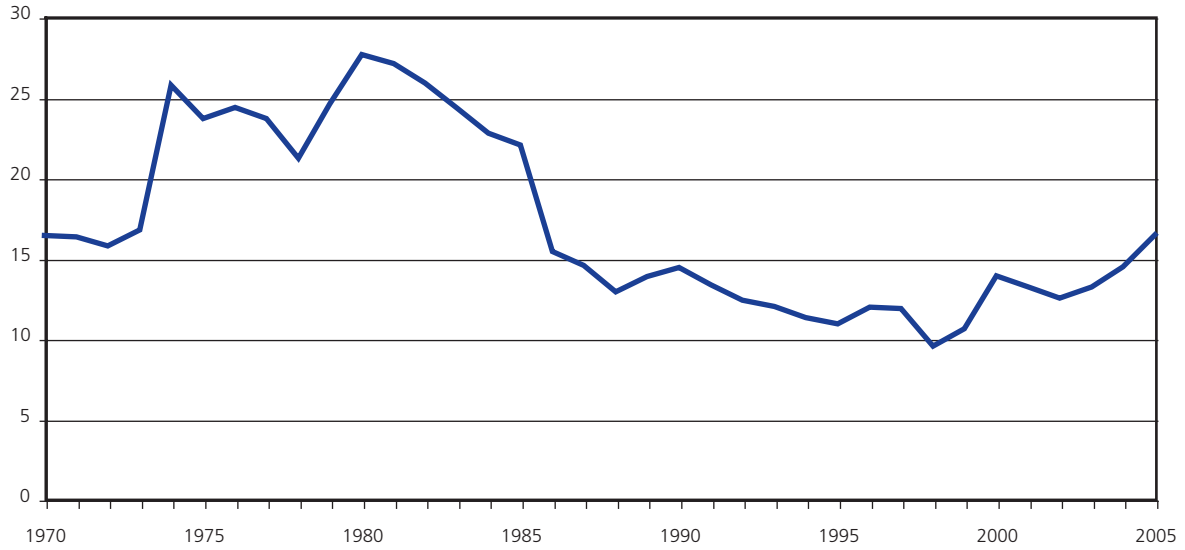
Chart 1
Import prices of major product groups in selected economies, 2005
(Annual percentage change)



Source: WTO.

The repercussion of oil market developments on international trade flows are large in terms both of the sectoral composition of merchandise trade and regional trade flows. The share of fuels in world merchandise exports rose to a twenty-year high and oil exporting countries and regions have recorded double-digit export increases over the last three years (Chart 2).

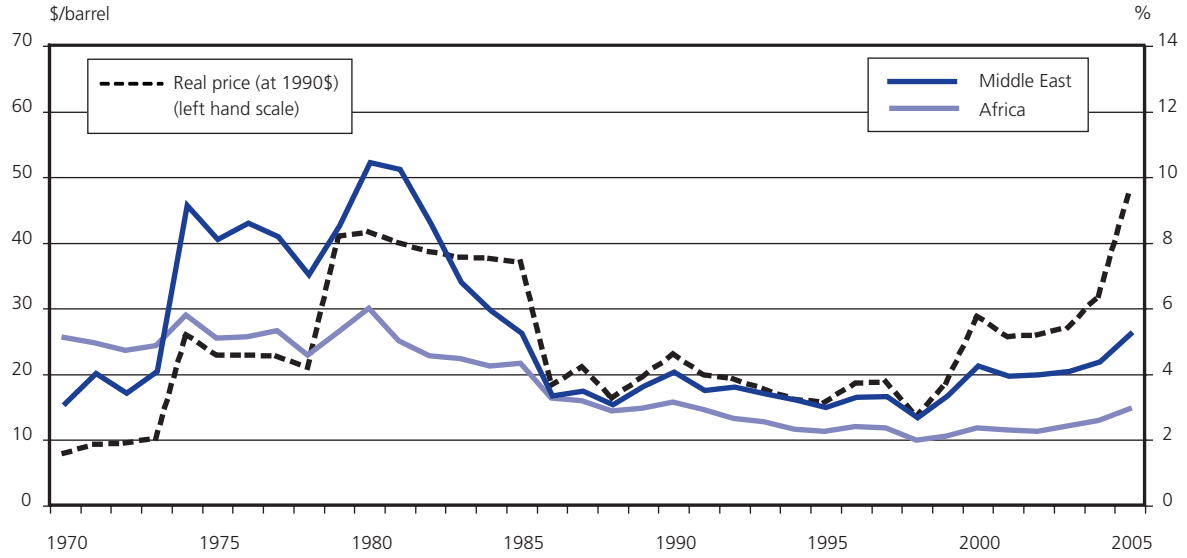
Chart 2
Share of fuels and other mining products in world merchandise exports, 1970-2005
(Percentages)



Source: WTO.

The dynamic growth in nominal exports of the oil exporting regions over the last three years resulted in a much larger share of these countries in world trade. It is striking to see how closely the share of these countries/regions is linked to oil price developments over the last 35 years. Chart 3 reveals that the peak of the real oil prices in 1974, 1990 and 2005 match closely the peak levels of the share of both the Middle East and Africa in world merchandise exports. The trough levels of oil prices in 1978, 1988 and 1998 coincide also with those in these regions' export shares.

Chart 3
Real oil price and shares of Africa and Middle East in world merchandise exports, 1970-2005
(Dollars and percentage shares)



Note: Real price is obtained by deflating the nominal IMF crude oil spot price by the WTO world export unit value index.
Source: IMF and WTO calculations.

The counterpart of the oil exporters' gains from higher oil prices are found in higher fuel import values of the net oil importing countries. However, as fuels account for a far lower share in their imports than in the exports of fuels exporting countries, the repercussion is more prominently seen in the evolution of the trade balances. The largest net importers of fuels are the European Union (25), Japan, the Unites States, the Republic of Korea and China. All these economies recorded a larger deficit or a reduced surplus in their current account as the value of their imports rose faster than exports, with the notable exception of China.

As energy is an important input in the production process, higher oil prices are passed on to other product groups and services in varying degrees, depending mainly on the energy intensity of these goods and services. Prices of steel and petrochemicals rose faster than those of less energy-intensive manufactured goods. Prices for transportation services also increased faster than those for travel and other commercial services over the last two years.

While higher trade prices tend to lead to a larger value share in the short run, the adverse effect on demand growth is likely to erode these gains in the medium and longer term. The impact of oil market developments is not limited to the sectoral and regional distribution of trade. The rise in transportation costs also has an overall impact on global trade. Products and services with a high freight cost component in their value will be more affected than other goods and services. Therefore, long distance trade flows and low value-added goods are in general more vulnerable to the rise in transportation costs.

3. REAL MERCHANDISE TRADE DEVELOPMENTS BY REGION IN 2005

All regions participated in the deceleration of world merchandise trade, as each major region expanded its real merchandise imports in 2005 less rapidly than in 2004. The expansion of imports of the oil-importing developed countries – Japan, the European Union (25) and the United States in 2005 was less than half the rate recorded in 2004. While US imports rose less than world trade they still expanded twice as fast as those of the European Union (Table 2).

Linked to its sluggish economic performance, Europe's trade growth was sharply reduced in 2005. Although the depreciation of the euro, the British pound and the Swiss franc in the course of 2005 improved somewhat the price competitiveness of European exporters in markets outside Europe, the expansion of real merchandise exports was limited to 3.5 per cent in 2005. However, as three-quarters of Europe's exports are destined to European countries, trade growth can only recover with stronger intra-European trade flows.

Table 2
GDP and merchandise trade by region, 2004-05
(Annual percentage at constant prices)

	GDP		Exports		Imports	
	2004	2005	2004	2005	2004	2005
North America	4.1	3.4	8.0	6.0	10.5	6.5
United States	4.2	3.5	8.5	7.0	11.0	5.5
South and Central America [a]	6.8	4.9	12.5	10.0	18.5	14.0
Europe	2.3	1.7	7.0	3.5	7.0	3.0
European Union (25)	2.2	1.6	7.0	3.5	6.0	2.5
Commonwealth of Independent States	8.0	6.6	13.0	4.5	16.0	16.5
Africa and Middle East	5.7	4.5	7.0	7.5	13.5	12.0
Asia	4.2	4.2	14.0	9.5	14.0	7.5
China	10.1	9.9	24.0	25.0	21.5	11.5
Japan [b]	2.3	2.8	10.5	1.0	7.0	2.5
World	3.9	3.3	9.5	6.0	...	...

[a] Including the Caribbean.
[b] Trade volume data are based on Japan's customs statistics. National account data report a markedly stronger export and import growth in 2005.
Source: WTO.

North America's real merchandise exports and imports expanded by about 6 per cent, the same rate as world trade in 2005. Oil-exporting Canada and Mexico increased their real imports faster than their exports, while the opposite development could be observed for the Unites States. For the first time in eight years US merchandise exports rose faster than world exports. The relative strength of US merchandise exports can be attributed to the recovery of agricultural product shipments and the continued strength of capital goods exports.

South and Central America's merchandise exports and imports continued to be among the most dynamic trade flows in 2005. Strong global demand and high prices for its major export commodities, combined with robust economic growth in the region, stimulated the region's exports and imports, which expanded at double-digit rates.

The major net-oil exporting regions – the Middle East, Africa and the Commonwealth of Independent States – all recorded a very strong expansion of their real merchandise imports by far exceeding world trade growth.

Asia's merchandise exports and imports expanded by 9.5 per cent and 7.5 per cent respectively. Asia's trade developments are prominently shaped by China's performance. In 2005, it is estimated that China's exports continued to expand by one-quarter in real terms and thereby more than two times faster than Asia's total exports or its own import growth.

4. NOMINAL MERCHANDISE AND COMMERCIAL SERVICES TRADE IN 2005

In 2005, the value of world merchandise exports rose by 13 per cent, to US$10.1 trillion, and that of world commercial services exports by 11 per cent, to US$2.4 trillion. For both merchandise and commercial services, this represented a marked deceleration in growth if compared with the preceding year. Cross-border commercial services exports expanded for the third year in a row less rapidly than world merchandise exports (Table 3).

Trade value developments by sector showed a large variation in their expansion rates in 2005, largely due to relative price developments. Weak and stagnating prices for food, agricultural raw materials and manufactured goods contrasted with a further sharp rise in the prices for metals and fuels. As shown above in Chart 2, the share of fuels and other mining products in world merchandise trade rose sharply to 16 per cent, the highest level since 1985 and matching the level recorded in 1970. On the other hand, the share of agricultural products in world merchandise exports decreased to a historic record low of less than 9 per cent. Although recent oil price developments played a major role in the further relative decline of agricultural products in world merchandise exports, they only accentuated an existing long-term downward trend. The share of agricultural products (including processed products) in world merchandise exports has decreased steadily over the last six decades, from more than 40 per cent in the early 1950s to 10 per cent in the late 1990s, as both volume and price trends have been less favourable than for other merchandise products (Chart 4).[8]

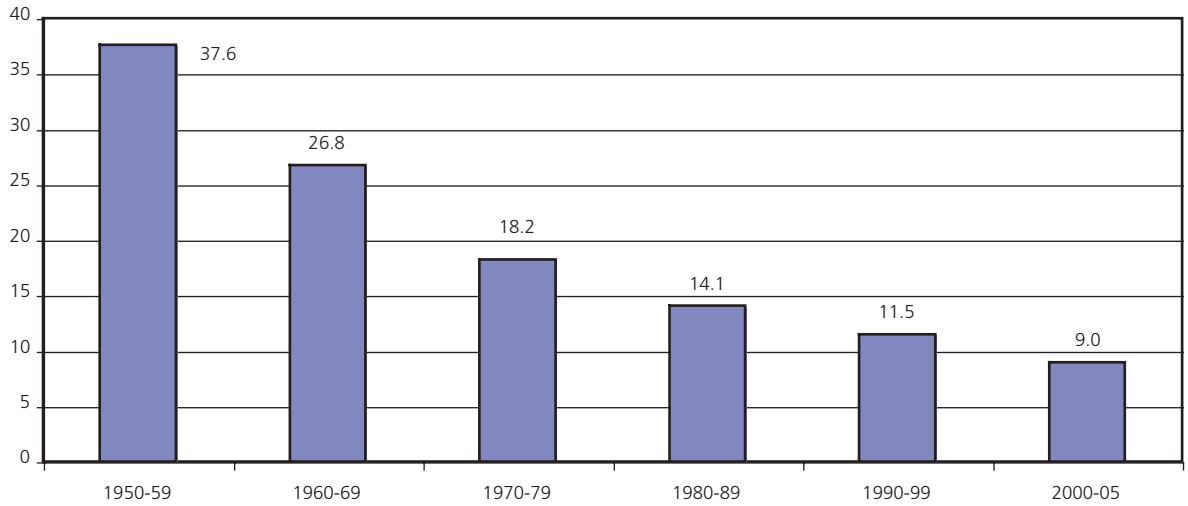
Table 3
World exports of merchandise and commercial services, 2005
(Billion dollars and percentage)

	Value	Annual percentage change			
	2005	2000-05	2003	2004	2005
Merchandise	10120	10	17	21	13
Commercial services	2415	10	15	19	11

Source: WTO.

Among manufactured goods it is estimated that the largest value increases were for iron and steel products, as well as for chemicals. Although there was a recovery in the global demand for computers and other electronic products, the trade value of these categories expanded no faster than the rate for manufactured goods in general. In other words, electronic products have not yet regained the dynamic role they played in the expansion of trade in manufactures throughout the 1990s. In the 1990s the export value of electronic goods rose on average by 12 per cent or two times faster than all other manufactured goods. Available information in early 2006 also points to a below-average expansion of global trade in textiles and clothing in 2005.

Chart 4
Share of agricultural products in world merchandise exports, 1950-2005
(Percentage, period averages)



Note: Agricultural products are defined according to WTO, ITS which differs somewhat from that used in the WTO Agreement on Agriculture (AOA).
Source: WTO.

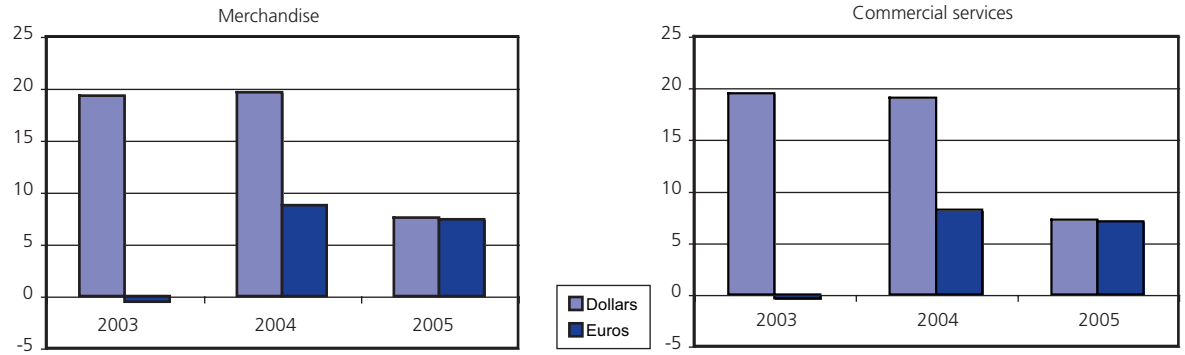
Among the broad commercial services categories (transportation, travel and other commercial services), expansion rates have been similar, ranging from nearly 10 per cent for travel to 12 per cent for transportation services. The relative strength in the export value of transportation services is largely linked to price developments.

[8] The decline in the share of agricultural products should not obscure the fact that trade in agricultural produce is growing. Indeed, the value of world exports in agricultural products increased 30 fold between 1950 and 2005.

Regional trade flows measured in dollar values reflect volume, price and exchange rate changes which sometimes work out in a cumulative manner and sometimes offset each other.

Europe, the largest trader among the major geographic regions, recorded the lowest export and import growth for both merchandise and commercial services of all regions in 2005 (Appendix Chart 1). It was also Europe which experienced the steepest deceleration among all regions in dollar trade growth in 2005. Most of this deceleration can be attributed to exchange rate developments. Measured in euro terms Europe's merchandise and commercial services both expanded by about 7 per cent in 2005, only moderately less than in 2004 (Chart 5).

Chart 5
Europe's nominal merchandise and commercial services exports in euro and dollar values, 2003-05
(Percentage changes)



Source: WTO.

North America's merchandise and commercial services exports rose by 12 per cent and 10 per cent respectively, which was somewhat less than the corresponding global averages. Imports of services expanded in line with the region's exports but merchandise import growth exceeded export growth. Over the last five years, the growth of North America's merchandise and commercial services exports was about half the 10 per cent average annual growth observed globally. Although North America's merchandise imports expanded one and a half times faster (at 6 per cent) than its own exports over this five-year period, they still lagged the expansion of world trade, estimated at 10 per cent (Appendix Tables 1 and 2).

The Middle East, Africa and the CIS, the world's largest net exporters of fuels, benefited from the further rise in fuel prices and increased their merchandise exports between 29 per cent and 36 per cent in 2005. The sharply rising export revenues in 2004 and 2005 enabled these regions to expand their merchandise and services imports faster than the global average.[9]

The importance of product structure as a determinant of the export performance in 2005 is highlighted if one distinguishes between the oil exporting African countries and the non-oil exporting African countries. Merchandise exports of South Africa and the other non-oil exporting countries in Africa have seen an increase of about 12 per cent – on a par with world merchandise trade growth. Exports of the oil exporting African countries had been far more dynamic surging by 45 per cent, through a combination of larger export volumes and higher prices. The oil exporting African countries recorded a merchandise trade surplus (f.o.b.- c.i.f.) in excess of US$100 billion, while the oil importing African countries record a deficit of US$40 billion in 2005 (Appendix Table 1).

South and Central America and the Caribbean region not only recorded very high merchandise trade of nearly one-quarter in 2005, but also the strongest expansion in commercial services trade of all regions. Strong economic growth, favourable commodity price developments and exchange rate appreciations contributed to these outstanding developments in the region's nominal trade values in 2005.

[9] According to preliminary data, services imports of the Middle East are estimated to have grown by 11 per cent and to have matched the increase in world services trade.

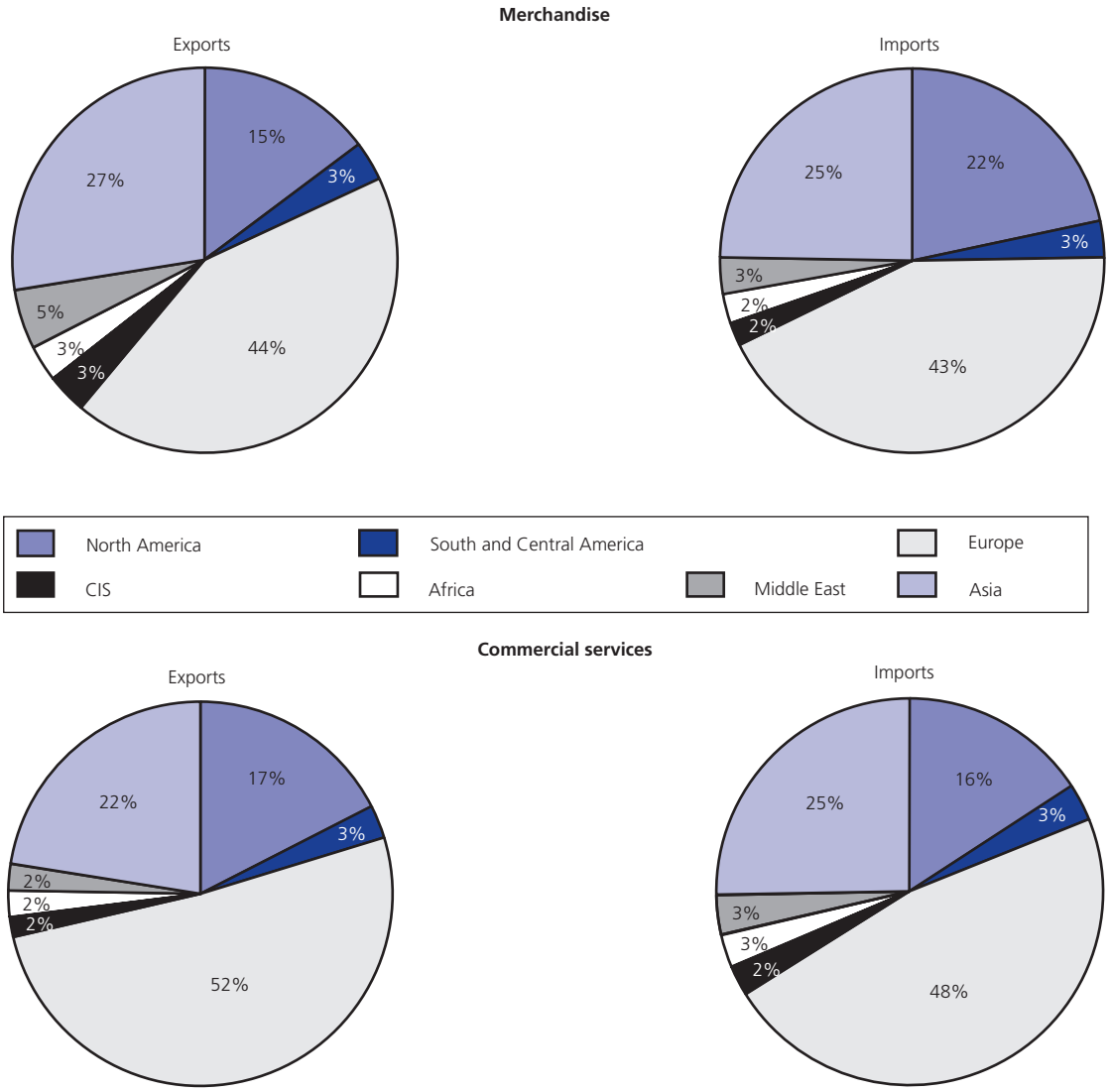
There was a sharp deceleration in Asia's nominal merchandise export and import growth but the expansion rate remained – at 15 per cent and 16 per cent respectively – somewhat stronger than global trade growth in 2005. Trade performance varied a good deal among Asian merchandise exporters. China, the leading trader in the region, reported export growth of 28 per cent and accounted for the first time for more than one-quarter of Asia's merchandise exports.[10] Other Asian countries' exports increased by 11 per cent in 2005, less than global merchandise exports. One of the weakest export growth rates in Asia was reported by Japan (5 per cent) and for the four East Asian traders (comprising Chinese Taipei; Hong Kong, China; the Republic of Korea and Singapore), export expansion in 2005 was limited to 12 per cent, less than half the rate observed in 2004. Despite its strong economy, China's import growth slowed down sharply in 2005. Under the impact of higher fuel prices, Japan's merchandise imports rose by 14 per cent, nearly three times faster than its exports. India reported import growth of 35 per cent, one of the highest rates among Asian traders (Appendix Table 1).

Asia's commercial services exports and imports have been far more dynamic than world commercial services trade. China's and India's services trade expansion exceeded that of other Asian countries by a large margin, although incomplete information (China) and methodological changes in recording (India) exclude a precise year-to-year comparison at this moment. Asia's largest services importer, Japan, saw a near stagnation of its total commercial services imports, largely due to a contraction of its travel services expenditures abroad.

As the summary review of regional trade developments above has shown, there can be as much variation in the trade performance within a region as among the major geographic regions. This observation argues for cautious use to be made of regional trade aggregates in the analysis of trade flows, and to complement it whenever feasible with more disaggregated data.

[10] There is an element of double counting in China's merchandise trade returns as some shipments recorded as exports return afterwards to China and are recorded as imports. Excluding these flows (of US$55 billion) from the reported numbers shown in Appendix Table 1 would lower China's trade expansion by about 1 percentage point in 2005. For more details see, WTO, International Trade Statistics 2005 (Box 2).

Appendix Chart 1
Share in world merchandise and commercial services trade by region, 2005
(Percentage share)



Source: WTO.

Appendix Table 1
World merchandise trade by region and selected country, 2005
(Billion dollars and percentage)

	Exports					Imports				
	Value	Annual percentage change				Value	Annual percentage change			
	2005	2000-05	2003	2004	2005	2005	2000-05	2003	2004	2005
World	10121	10	17	21	13	10481	10	17	22	13
North America	1478	4	5	14	12	2285	6	8	16	14
United States	904	3	5	13	10	1733	7	9	17	14
Canada	360	5	8	16	14	320	6	8	14	14
Mexico	214	5	3	14	14	232	5	1	15	12
South and Central America [a]	351	13	15	29	25	294	7	6	28	22
Brazil	118	17	21	32	23	78	6	3	31	17
Other South and Central America [a]	232	11	12	28	26	216	8	7	27	24
Europe	4353	11	19	20	8	4521	10	20	20	9
European Union (25)	3988	10	19	19	7	4120	10	20	20	8
Germany	971	12	22	21	7	774	9	23	18	8
France	459	7	18	15	2	496	8	21	18	5
United Kingdom	378	6	9	14	9	501	8	13	20	6
Italy	367	9	18	18	4	380	10	20	19	7
Other Western Europe	233	10	14	18	14	182	8	15	16	10
Switzerland	126	9	15	18	6	121	8	15	16	9
South-East Europe	132	21	29	34	17	219	19	33	36	18
CIS	342	19	27	36	29	216	21	27	31	25
Russian Federation	245	18	27	35	34	125	23	25	28	28
Africa	296	15	26	30	29	248	14	21	29	16
South Africa	52	12	23	26	13	67	17	40	39	16
Africa less South Africa	244	16	26	31	33	181	13	16	26	16
Oil exporters [b]	166	18	33	41	45	63	17	17	34	17
Non oil exporters	78	11	18	18	12	118	11	15	22	16
Middle East	529	15	20	30	36	318	15	15	26	19
Asia	2773	11	19	25	15	2599	12	20	27	16
Japan	596	4	13	20	5	516	6	14	19	14
China	762	25	35	35	28	660	24	40	36	18
Four East Asian traders [c]	731	9	19	25	12	676	8	15	27	14
India	90	16	16	33	19	132	21	26	37	35
Memorandum items:										
MERCOSUR (4)	163	14	19	28	20	113	5	11	38	18
ASEAN (10)	653	9	16	20	14	593	9	13	25	16
EU (25) extra-trade	1328	11	17	21	10	1460	10	19	21	14
EU (15)	3679	10	19	18	6	...	...	...	...	...
EU (new members, 10)	309	20	29	34	16	...	...	...	...	...
Developing economies	3443	13	19	27	22	3024	12	17	28	17
Developing Asia	2050	13	21	27	18	1932	13	22	30	17

[a] Includes the Caribbean.
[b] Algeria, Angola, Chad, Congo, Equatorial Guinea, Gabon, Libya, Nigeria, Sudan.
[c] Chinese Taipei; Hong Kong, China; Republic of Korea and Singapore.
Note: For the composition of country groups see the Technical Notes.
Source: WTO.

Appendix Table 2
World trade of commercial services by region and selected country, 2005
(Billion dollars and percentage)

	Exports					Imports				
	Value	Annual percentage change				Value	Annual percentage change			
	2005	2000-05	2003	2004	2005	2005	2000-05	2003	2004	2005
World	2415	10	15	19	11	2361	10	14	18	11
North America	420	5	5	11	10	373	7	9	15	10
United States	353	5	5	11	10	289	7	8	15	10
Canada	51	5	7	11	9	62	7	14	13	10
Mexico	16	3	0	12	12	22	5	3	10	12
South and Central America[a]	68	8	10	16	20	70	5	4	14	22
Brazil	15	11	9	21	28	22	7	6	12	38
Other South and Central America[a]	53	7	10	14	17	48	4	3	15	15
Europe	1233	11	19	19	7	1119	11	19	16	8
European Union (25)	1104	11	19	19	7	1034	10	19	16	7
Germany	143	12	20	15	7	199	8	19	13	4
United Kingdom	183	9	15	23	-1	150	9	13	20	4
France	114	7	15	12	4	103	11	20	18	7
Italy	93	11	19	17	13	92	11	20	10	15
Other Western Europe	77	11	16	23	12	57	13	15	23	14
Switzerland	45	10	15	24	9	25	10	11	25	7
South-East Europe	52	12	35	23	15	29	13	27	30	19
CIS	40	18	16	23	20	58	20	17	24	18
Russian Federation	24	20	20	25	20	38	18	16	23	15
Africa	57	13	26	20	12	66	12	16	19	15
South Africa	10	16	69	14	17	12	16	52	26	19
Middle East	54	11	27	14	12	80	11	19	20	11
Asia	543	12	10	26	19	595	10	10	25	15
Japan	107	8	8	25	12	136	3	3	22	1
China	81	22	18	34	...	85	19	19	31	...
Four East Asian traders[b]	175	8	9	18	9	165	8	8	21	10
India	68	33	21	66	...	67	29	23	53	...
Memorandum items:										
MERCOSUR (4)	23	8	13	21	25	31	4	8	15	32
ASEAN (10)	104	8	2	22	10	132	9	9	21	14

[a] Includes the Caribbean.
[b] Chinese Taipei; Hong Kong, China; Republic of Korea and Singapore.
Note: For the composition of country groups see the Technical Notes.
Source: WTO.

B SELECTED TRADE DEVELOPMENTS AND ISSUES

1. TRADE IN TEXTILES AND CLOTHING

The Agreement on Textiles and Clothing (ATC) came to an end on 1 January 2005. Much interest, not to mention concern, was expressed about the likely impact on production and trade of the removal of quota restrictions. It was apparent to most observers that there would be winners and losers from the additional liberalization. It is too early to say how the market will look beyond the relatively short period upon which we can base our observations, but this note looks at what we know so far about the pattern of trade that has emerged since the quantitative restrictions were (largely) removed. A caveat is in order here: there can be little doubt that the termination of the ATC affected the patterns of trade observed in 2005, but we have not developed a rigorous analytical approach to the question of what other factors might also influence the pattern of trade flows.

International trade in textiles and clothing has played an important role in the development process of many countries and in their integration into the world economy. Today, the textiles and clothing sector accounts for a major part of merchandise exports of a large number of low- and middle-income countries. Developing countries as a group accounted for more than one-half of world exports of textiles and clothing in 2004. In no other category of manufactured goods do developing countries enjoy such a large net-exporting position. Exports of textiles and clothing continued to exceed agricultural exports in many developing countries and in the aggregate throughout the 2000-04 period. However, textiles and clothing is not a very dynamic product group, as its share in developing country merchandise exports has been declining rather steadily since 2000. The share was less than 10 per cent in 2004. Further liberalization of trade in textiles is of major interest for many developing countries as it improves market access in an area where many of them have comparative advantage. However, some developing country exporters who have benefited from preferential market access are concerned about increased competition resulting from further liberalization.

The quota restrictions that went with the ATC were in respect of imports of Canada, the European Union and the Unites States.[11] These three markets account for more than one-half of world textiles and clothing imports. The removal of quotas could therefore be expected to have a significant impact on global trade flows,[12] even though the end of the ATC quota regime did not represent the complete elimination of protection in these markets – relatively high tariff averages continue to be applied in the sector.[13] Nevertheless, the end of a special trade regime that had existed for more than 40 years for textiles and clothing marked an important step forward, both in terms of trade liberalization and the elimination of negotiated trade arrangements clearly in breach of key WTO rules.

At the beginning of 2005, China introduced an export tax on a number of textile products. The tax was increased in May and partly abolished in June after the United States and the EU sought new restrictions on exports of textiles and clothing from China, their most important single supplier. The legal basis for these new restrictions was Paragraph 242 of the Report of the Working Party for the Accession of China to the WTO. The new quotas apply until the end of 2007 for the EU and until the end of 2008 for the United States (see Box 1). Imports from all other (WTO) suppliers remained free of quantitative restrictions in the EU and US markets. Certain other countries also applied restrictions on Chinese textiles in 2005, using the special safeguard negotiated as part of China's terms of accession to the WTO. These actions have no doubt slowed down Chinese export expansion. In what follows, we shall examine what changes have occurred in the level and geographical composition of trade in textiles and clothing during 2005. We shall also review briefly what has happened to prices, production and employment in the EU and the United States in the post-ATC period.

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11 Norway previously restricted its imports under the ATC but had eliminated its last quotas by January 1, 2001.

12 The EU and the United States each account for about one-fourth of world imports if EU intra-trade is excluded. The three markets combined accounted for 54 per cent of global textiles and clothing imports in 2004.

13 Tariff averages in textiles and clothing (MFN simple applied rates) are significantly higher than for total non-agricultural products (e.g. Canada 11.3 per cent versus 4.0 per cent, EU 7.9 per cent versus 4.0 per cent and the United States 8.7 per cent versus 3.3 per cent). See WTO, World Trade Report 2005, Tariff Profiles.

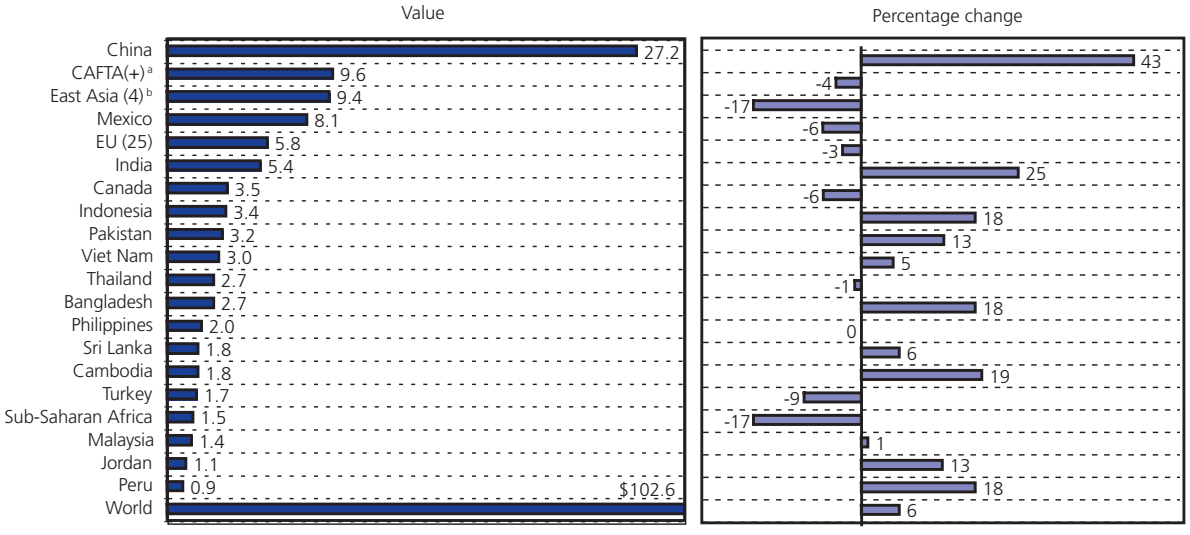
(a) Textiles and clothing trade developments in 2005

Although the lifting of the ATC quotas created more favourable conditions for the expansion of world trade in textiles and clothing, trade in these products is estimated to have expanded in value terms by 5 per cent in 2005, compared to 12 per cent in 2004. This slowdown in 2005 is linked to the deceleration of economic growth in the developed countries and partly due to lower dollar prices as a result of exchange rate developments.[14] China's exports of textiles and clothing expanded by 21 per cent in 2005, which is marginally faster than in 2004 but not as fast as in 2003. China's share in global textiles and clothing trade has increased, reaching a new peak level in 2005 of 24 per cent if EU(25) intra-trade is included and 31 per cent if EU(25) intra-trade is excluded.

A review of textiles and clothing import developments in 2005 in the United States and the EU(25) shows that there was no acceleration in overall import growth, but that major shifts occurred among the principal suppliers in each market.

Imports of textiles and clothing[15] into the United States rose by 6 per cent in 2005, at about the same rate as in 2004 (to US$103 billion). The growth rates of imports from different suppliers exhibited considerable variation, ranging from an increase of 43 per cent for China to a decrease of 24 per cent from the Republic of Korea. Data on US imports presented in Chart 1 show that – besides China – seven suppliers (five in Asia – India, Indonesia, Pakistan, Bangladesh and Cambodia – plus Jordan and Peru) expanded their shipments at double-digit growth rates, while high-income developing economies in East Asia[16] recorded a drop of 17 per cent in their exports to the United States. Imports from various preferential suppliers decreased by different degrees. While US imports from Sub-Saharan Africa shrank by 17 per cent, those from NAFTA member states decreased by 6 per cent and those from CAFTA member states plus the Dominican Republic declined by 4 per cent. According to the data provided in Chart 1, many suppliers gained market share but none expanded their share as strongly as China. On the other hand, many suppliers have seen their shares shrinking and some of them also experienced absolute reductions in their shipments.

Chart 1
United States imports of textiles and apparel by country and region, 2005



[a] Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua.
[b] Hong Kong, China; Republic of Korea; Macao, China; and Chinese Taipei.
Source: US Department of Commerce, Bureau of the Census, International Trade Statistics.

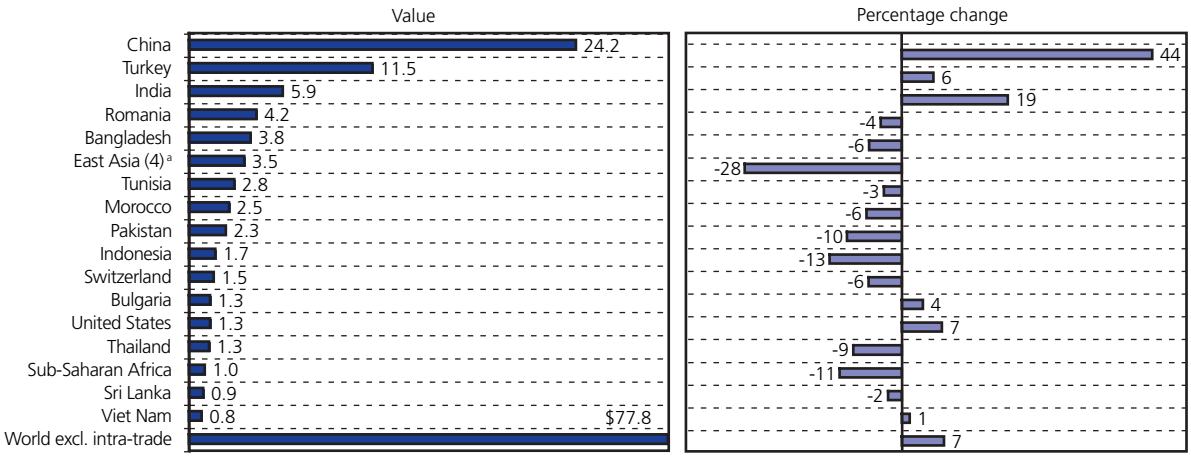
[14] The euro/dollar exchange rate decreased by 9 per cent in 2004 which inflated intra-European trade flows measured in dollar terms. In 2005, however, the euro/dollar rate remained on average unchanged from the preceding year.

[15] For the analysis of textiles trade various definitions are found. In this overview the textiles product categories are defined according to the Standard International Trade Classification, Revision 3 as is the practice in the regular WTO publications, International Trade Statistics and the World Trade Report. Textiles are defined as SITC Division 65 and clothing as SITC Division 84.

[16] Hong Kong, China; Republic of Korea; Macao, China and Chinese Taipei.

Looking at the EU(25) import market[17] for textiles and clothing in 2005, one finds some traits similar to those observed in the case of the United States. First, the overall increase in the first ten months was nearly 7 per cent. This growth rate was as strong as that of the United States but less than in 2004. Second, as in the case of the United States, the biggest import increases are reported for China and India. Third, large import decreases are observed for the four high-income developing East Asian economies and the Sub-Saharan economies.[18] EU(25) imports from geographically proximate major preferential trading partners recorded a mixed performance, with moderate import increases from Turkey and Bulgaria contrasting with lower supplies from Romania, Tunisia and Morocco. In contrast to the double digit increases in United States imports, EU(25) textiles and clothing imports from Bangladesh, Cambodia, Indonesia and Pakistan decreased in 2005 (see Chart 2).

Chart 2
European Union(25) imports of textiles and clothing by country and region, January-October 2005



[a] Hong Kong, China; Republic of Korea; Macao, China; and Chinese Taipei.
Source: Eurostat.

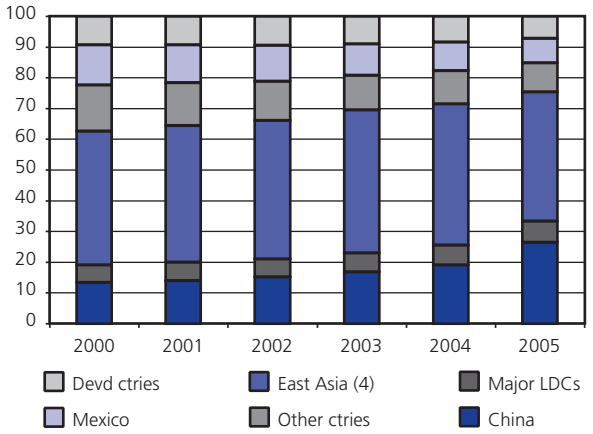
A rapid rise in the import share of previously restricted suppliers was widely expected. In the case of China, developments in 2005 only accentuated an existing trend towards a larger share of Chinese exports in world trade. This trend could already be observed during the last four years or more. Over the same period, the high-income developing economies in Asia as well as the developed countries recorded a decline in their trade share (see Chart 3 and Chart 4 on US imports). In other words, the sharp rise in US and EU imports of textiles and clothing products from China largely reflects a shift among suppliers.

A review of the overall level of imports conceals more disruptive changes at a disaggregated level. The surges in imports of certain textiles and clothing categories observed in the early months of 2005 were concentrated on a subset for which the ATC quota restrictions had severely limited Chinese exports until the end of 2004. In the seven product categories for which the United States invoked safeguard actions and implemented new quantitative restrictions, the share of China in US imports was less than 4 per cent on average (in value terms) in 2004. In some other categories which had been less restricted, such as infants' apparel and gloves, China's share in US imports exceeded 50 per cent in 2004. It is therefore no surprise that for the group of tightly restricted categories, US imports from China tripled in the first nine months of 2005. For all the other categories, US imports from China increased by 46 per cent over the same period. In the EU, a surge of 168 per cent in the dollar value of imports occurred in the first quarter of 2005 in respect of the nine categories for which safeguard actions were taken in May, compared with an increase of only 17 per cent for all the remaining categories. Again, the share of China in EU(25) extra-regional imports was less than 10 per cent for this group of products in 2004.

17 Excluding EU(25) intra-trade, which accounts for about one-half of EU(25) total imports decreased by 2 per cent in the first ten months of 2005.

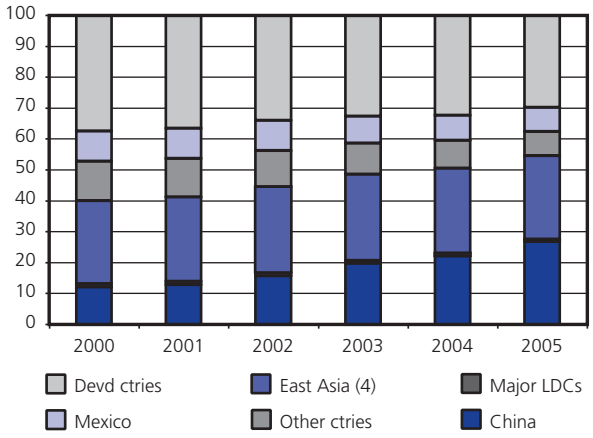
18 Large variations in import growth could be observed among the Sub-Saharan countries. EU(25) imports from Madagascar rose by 15 per cent to US$200 million, decreased by 15 per cent from Mauritius, the largest supplier in Sub-Saharan Africa, and by 18 per cent from all the other countries combined.

Chart 3
Regional structure of United States' textiles imports by region, 2000-05
(Percentage shares)



Major LDCs (6): Bangladesh, Cambodia, Lesotho, Madagascar, Haiti and Nepal.
East Asia (4): Hong Kong, China; Republic of Korea; Macao, China; and Chinese Taipei.
Developed Countries: Canada, Europe, Australia, Japan and New Zealand.
Source: UNSD Comtrade database and US Census Bureau, US International Trade Statistics.

Chart 4
Regional structure of United States' clothing imports by region, 2000-05
(Percentage shares)



Major LDCs (6): Bangladesh, Cambodia, Lesotho, Madagascar, Haiti and Nepal.
East Asia (4): Hong Kong, China; Republic of Korea; Macao, China; and Chinese Taipei.
Developed Countries: Canada, Europe, Australia, Japan and New Zealand.
Source: UNSD, Comtrade database and US Census Bureau, US International Trade Statistics.

The impact of restrictions on Chinese exports in the United States and the European Union was still limited in the third quarter. China's exports of textiles and clothing to the world increased by 26 per cent on a year-to-year basis in the third quarter, which was somewhat faster than in the first half of 2005. However, in the fourth quarter, the expansion of China's textiles and clothing exports slowed down markedly, to 12 per cent.

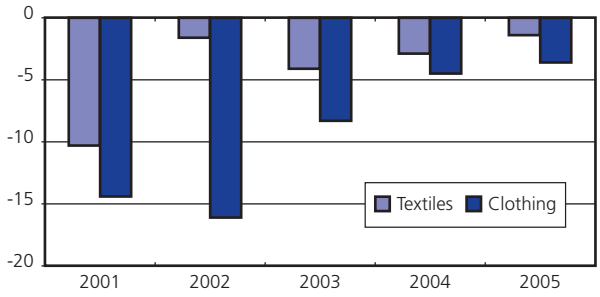
Textiles and clothing sales by China to the European Union expanded in the third quarter of 2005 by nearly 50 per cent, somewhat faster than in the first half, while in the United States a deceleration in the growth of imports from China could already be observed in the third quarter of 2005. The share of China in US textiles and clothing imports stabilized at 27 per cent in the third quarter of 2005 and decreased thereafter.

The reintroduction of quantitative limits on a single supplier has been justified by the importing countries in terms of the threat of market disruption. One element of market disruption concerns production and employment in the home market. Chart 5 shows the evolution of US textiles and apparel production since 2000. Between 2000 and 2004, US textiles and apparel production was shrinking in each year with one single exception (the stagnation of output in 2002). In the first six months of 2005, US apparel production was declining on a year-to-year basis by 6.5 per cent, slightly more than in 2004, but less than in each year since 1999. With respect to textiles output, the decrease was limited to 2.2 per cent, a lower rate than in the preceding year. In the second half of 2005 the output decline was reduced, leading to an average annual decline in 2005 smaller than in 2004. Employment in the United States textile and clothing industry has been steadily declining over the last ten years, with the decline more pronounced in clothing than in textiles. In clothing, employment decreased by more than two-thirds, from 820,000 in January 1995 to 280,000 in October 2005. Although US employment in apparel decreased further in the first half of 2005 – by nearly 10 per cent from the preceding year's level – this decline was still somewhat less dramatic than the average decline observed over the last 10 years. Both employment and production data point to a major long-term structural decline in the US textile and apparel industry, which selective restrictions on imports have been able to delay somewhat, but have not arrested.

Textiles and clothing production in the EU also recorded a marked downward trend in the 2000-2004 period (Chart 6). The cumulative decline in production for the four years was 15 per cent for textiles and 25 per cent for clothing. In the first half of 2005, the production decline was steeper than in the preceding year (with a decline of 5 per cent in textiles and 10 per cent in clothing). In the third quarter, following the introduction of new restrictions on imports, the rate of decline decreased somewhat (to 4 per cent and 8 per cent, respectively). As regards EU employment, the decline observed over the 2000 to 2004 period was more pronounced in textiles than in the clothing industry. These divergent trends continued in the first half of 2005, as the decrease in textiles employment slowed down while that in the clothing industry accelerated, reaching 7.6 per cent over the year in the second quarter.

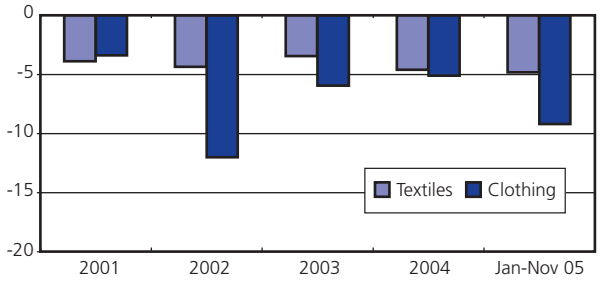
Both production and employment data indicate that the competitive situation of the textiles industry in Europe and the United States is more favourable than that of the clothing industry. Three factors might explain this. First, textiles production is far more capital-intensive than clothing, which reduces the advantage low-wage countries have *vis-à-vis* high-income countries. Second, some textiles production is destined to product markets (such as technical textiles) which exhibit stronger demand growth than is the case for clothing.[19] Third, preferential trading arrangements with specific rules of origin tend to support the textiles industry located in these two markets.

Chart 5
United States textiles and clothing production, 2001-05
(Percentage change)



Source: Board of Governors of the Federal Reserve System, Federal Reserve Statistical Release January 17, 2006 (available at www.federalreserve.gov/releases/G17).

Chart 6
European Union(25) textiles and clothing production, 2001-05
(Percentage change)



Source: Eurostat.

Price developments in international trade in textiles and clothing can be observed at different levels. Looking at overall import prices of textiles and clothing, one observes that the import prices of the United States (and Germany) in these two categories evolved slightly faster than those of all manufactured goods between 2000 and 2004. Prices of textiles increased somewhat faster than those of clothing (Table A28, ITS 2005). In the first nine months of 2005, US import prices for textile and clothing from all sources remained basically unchanged, while prices of other manufactured goods increased slightly over the preceding year's level. This price information does not support the view that the lifting of the quotas had a marked downside impact on prices at an industry level. However, investigations at the detailed product level (at which the safeguard actions were examined) revealed that the unit price of products originating from China decreased sharply in 2005. Despite their steep decline, unit values of Chinese goods did not necessarily fall below the prices of similar goods imported from all other sources in 2005 – in most cases the Chinese prices were higher in 2004. Despite their decline, Chinese unit values remained higher than those from all other sources in three out of seven textiles categories during the first nine months of 2005. The impact of China on average US import prices from all sources was moderate. In four out of seven categories, average unit values decreased between 1 per cent and 5 per cent and increased in one category by 3.5 per cent. For cotton yarn, however, the average unit value fell by 17 per cent. This decline is largely attributable to the fall in cotton prices over the same period. In general, increased imports of Chinese goods only exerted moderate downward pressure on the prices of textile goods in the US market.[20]

19 "It is estimated that technical textiles are growing at roughly twice the rate of textiles for the clothing industry, where growth rates have been about 2 per cent a year in recent years" (Audet, 2004).

20 US retail prices of apparel decreased by less than 1 per cent in 2005 or half the average annual decline recorded in the four preceding years.

The moderate impact of the sharp rise in imports of Chinese textiles on price levels is also confirmed for the EU market. According to the EU Commission, retail prices recorded small changes. Producer prices remained flat in the textiles industry and increased marginally for clothing. In the first nine months of 2005, producer prices increased slightly faster than in 2004. Overall price stability at the retail and producer level contrasts with the observed decrease in the import unit values of textiles and clothing goods from China, for which safeguard actions were initiated in May 2005. For the nine categories involved, price declines measured in euro terms ranged from -5 per cent to 36 per cent, and averaged 22 per cent (arithmetic average). One explanation for the limited impact of China on the overall price level might be found in the value of imports from China in these categories (€5.3 billion) compared to total EU(25) textiles and clothing imports (€54.5 billion). Prices of non-monitored textiles imports from China, which amounted to €11.1 billion, have probably been more stable than prices of monitored goods.

The expansion of global textiles trade in the years to come will be driven primarily by the rise of consumer expenditure in the United States and Europe. Consumer expenditure on clothing (and shoes) in the United States expanded much faster than overall consumption over the last three years, underpinning import growth. It is not certain that this dynamic growth can be maintained. The new quotas introduced in 2005 will cap the expansion of Chinese textiles sales to the US and EU markets in 2006 and 2007. However, the annual growth rates of these quotas are well above past import demand trends, so China's share of imports in these two markets can be expected to increase over the next few years. This implies that competitive pressures on the world's largest import markets for textiles and clothing will prevail.

Box 1: Selected Trade Policy Actions in the Textiles Sector in 2005

United States: [1]

April 27	The (US) Committee on the Implementation of the Textiles Agreement (CITA) agreed to consider the requests for safeguard actions on imports from China for seven categories of textiles and apparel products. The public is invited to comment on this request in the review process.[2]
May 23	CITA requests bilateral textile negotiations with the government of China and establishes limits on imports of (seven) textile categories originating from China. Quotas limiting imports start on May 23 and extend through December 31, 2005. The consultations and the implementation of quotas are based on paragraph 242 of China's Accession Agreement to the WTO. This paragraph allows WTO Members who believe that imports of Chinese origin textile and clothing products are causing market disruption and threatening to impede the orderly development of trade in these products to request consultations with the government of China with a view to ease or to avoid such market disruption. Upon receipt of the request, China agreed to hold its shipments to a level not greater than 7.5 per cent above the amount entered during the last 12 months.
November 8	Memorandum of Understanding (MOU) is signed by the United States Trade representative and the Minister of Commerce of the People's Republic of China. Its objective is to limit exports from China and imports into the United States of Chinese origin textile and apparel products in 2006, 2007 and 2008. For 21 categories, quantitative levels are fixed for each year. The 2006 quotas allow for an increase of between 173 per cent and 640 per cent between 2004 and 2006 (for the most restricted categories). For all the products covered, the quantitative increases range from 12.5 per cent to 16 per cent in 2007 and between 15 per cent and 17 per cent in 2008.

European Union: [3]

April 29	European Commission starts investigations for evidence on market disruption caused by imports from China in nine textiles categories.

May 25 European Commission engages in formal consultations with the government of China according to paragraph 242 of China's Accession Agreement to the WTO with a view to addressing market disruption.

June 10 Memorandum of Understanding (MOU) between the European Commission and the Ministry of Commerce of the People's Republic of China on the export of certain Chinese textiles and clothing products to the European Union is signed. This MOU limits China's textiles export growth to the European Union for ten categories for the years 2005, 2006 and 2007. Annual quantity growth rates range for most categories from 10 per cent to 12.5 per cent from the import level of a base year, April 2004 to March 2005.[4] The European Commission agrees to exercise restraint concerning the application of the EU rights under Paragraph 242 for the textile categories which are not restricted until 2007, and for all textile products in 2008. In contrast to the MOU between the US and China, no quantitative limits are set on China's textiles exports to the European Union for 2008.

China: [5]

January 1 China's Ministry of Finance unilaterally introduces a specific export duty on 148 (8-digit) textiles and clothing products.

May 20 Ministry of Finance announces that, effective 1 June 2005, export taxes would be increased for 74 textiles and clothing products (8-digit level), reduced for 3, removed for 2, and one more product was added.

May 30 Effective 1 June 2005, China revoked the export duties on 79 textiles and clothing products.

June 10 China's Ministry of Commerce signs a MOU with the EU Commission.

July 21 The peg of the Chinese currency to the United States dollar is replaced by a peg to a currency basket which leads to a moderate appreciation of the Renminbi.

July 25 China announces the removal of export taxes on 17 textiles and clothing products, which are subject to quantitative restrictions based on the MOU with the EU Commission.

November 8 China's Ministry of Commerce signs a MOU with the United States Trade Representative.

December 13 Ministry of Finance announces that it will suspend all export taxes on textiles products by January 1, 2006.

Other developments:

In the first half of 2005, 14 anti-dumping investigations were initiated and notified to the WTO in the textiles sector (HS Section XI), two less than in the first half of 2004. No initiations of countervailing measures are reported in this sector in the first six months of 2005

September Colombia notifies the WTO of provisional safeguard measures on the imports of textile products originating in China. (Measures taken are based on the transitional product-specific safeguards provided in China's WTO Accession Protocol).

December Brazil discusses restrictions on China's textiles exports to Brazil, according to press reports. (February14, 2006 an export restraint agreement was signed, covering eight categories (comprising 70 products), which will be in effect until the end of 2008.)

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1 Information on US trade policy actions is taken from the website of the United States Office of Textiles (http://otexa.ita.doc.gov/msrpoint.htm) and that of the United States Trade Representative http://www.ustr.gov/Trade_Sectors/Textiles_Apparel/Section_Index.html.

2 In the second half of 2004 several similar requests had not been accepted for consideration by CITA.

3 Information on EU trade policy actions is taken from European Commission website http://europa.eu.int/comm/trade/issues/sectoral/industry/textile/index_en.htm

4 For two categories (4 and 115) the base year is March 2004 through April 2005, and for three other categories (5,6 and 7) the annual growth is limited to 8 per cent in 2005.

5 China Ministry of Commerce (http://english.mofcom.gov.cn/), China Ministry of Finance (http://www.mof.gov.cn/index.htm) and other sources.

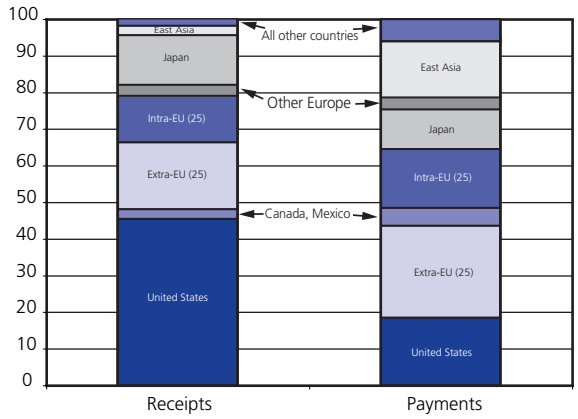
2. INTERNATIONAL PAYMENTS AND RECEIPTS OF ROYALTIES AND LICENCE FEES, 1995-2004

Limited quantitative information is available on international payments relating to intellectual property rights. This Section examines available information on international transactions involving royalties and licence fees (R&LF). Some developing countries have expressed concern at various times about the increase in these kinds of payments that would arise as a result of the WTO Agreement on Trade-Related Intellectual Property Rights. It appears, however, that developing countries outside East Asia account for a very small part of global R&LF payments, which are largely made among developed countries.

Balance of payments statistics (BOP) provide information on the international flows of R&LF, defining them as "the exchange of payments and receipts between residents and non-residents for the authorized use of intangible, non-produced, non-financial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, franchises, etc.) and with the use, through licensing agreements, of produced originals or prototypes (such as manuscripts and films)".[21] Payments and receipts for the purchase or sale of the assets and rights are excluded and recorded as capital account transactions. Despite numerous statistical difficulties in recording the above transactions, the available data nevertheless allow one to sketch some broad developments over recent years.

On the basis of the available information provided in national BOP, it has been estimated that the global payments of R&LF amounted to about US$130 billion in 2004[22]. The share of R&LF in world commercial services trade was 6 per cent in 2004. Between 2000 and 2004, the growth rate of global R&LF payments is estimated to have been 11 per cent – an annual rate roughly similar to the expansion of commercial services trade (about 9 per cent).[23] R&LF are largely paid among the industrially more advanced countries of North America, Europe and East Asia.[24] These regions account for more than 90 per cent of the global credit and debit payments in this services category.

Chart 7
Receipts and payments of royalties and licence fees by country and region, 2004
(Percentage share)



Note: East Asia comprises Singapore; China; the Republic of Korea; Chinese Taipei; Thailand; Hong Kong, China and Malaysia.
Source: IMF, Balance of Payments Statistics; Eurostat, national statistics and WTO estimates.

An important feature of current global flows of R&LF payments is that they occur largely among affiliated companies. In the case of the United States, three-quarters of the receipts of R&LF originated from affiliated transactions of multinational enterprises located in the United States (i.e. receipts by US parents from their foreign affiliates and those by US affiliates of foreign companies). On the payment side, the corresponding ratio was nearly 80 per cent in 2004.[25] Almost all of Singapore's payments of R&LF are accounted for by Singapore subsidiaries of foreign multinational corporations.[26] The high level of intra-firm transactions adds to

21 IMF Balance of Payments Manual, 5th edition, 1993.

22 Estimated global payments (debits) exceeded global receipts (credits) by more than 10 per cent in 2004. An excess of debit over credit flows could be observed in varying degrees over the last eight years. A large part of this discrepancy at the global level can be attributed to intra-EU flows. Theoretically, intra–EU payments should be balanced by corresponding receipts but the statistical records show a deficit of US$8 billion in 2003.

23 During the 1995-2000 period, reported global R&LF payments and receipts increased on average by 9 per cent, or two times faster than global commercial services trade. However, it is uncertain to what extent an improvement in the coverage of reported R&LF payments affects the comparison.

24 Comprising Japan; China; Hong Kong, China; the Republic of Korea; Malaysia; Singapore; Thailand and Chinese Taipei.

25 US Department of Commerce, Survey of Current Business, July 2005, US International Transactions.

26 Singapore Department of Statistics, Occasional Paper 49, Singapore's International Trade in Services: New estimates and analysis, p. 7, March 2000.

concerns about the accuracy of the data. Reported transaction values in balance of payments statistics might be affected by tax considerations and not always reflect the market value accurately.

A detailed breakdown of R&LF payments by type is not available. Therefore, it is difficult to assess at the global level the relative importance of revenues from trade marks, franchise fees, patent fees for industrial products and processes, copyrights from books, films and sound, earnings from broadcasting and recording of live events, and general use computer software.

A review of R&LF transactions by country reveals that the United States is the largest recipient of R&LF payments and, after the EU(25), the second largest source of payments (see Chart 7 and Table 1). In 2004, United States' receipts of R&LF reached US$52.6 billion, exceeding its payments by nearly US$29 billion. Over the 2000-2004 period, the surplus of the United States eroded as its R&LF payments rose two times faster than its receipts (45 per cent and 22 per cent respectively). The share of the United States in worldwide receipts of R&LF has decreased since 2000, when it still accounted for more than one-half of global receipts. The EU(25) payments of R&LF of about US$53 billion in 2004 are the largest in the world, accounting for about 42 per cent of the global payments (including intra-EU trade). The expansion of the receipts of R&LF of the EU(25) has been on average inferior to that of payments throughout the 2000-2004 period, thereby preserving the deficit in these transactions. The EU(25) recorded a deficit of US$10.4 billion with third countries in 2003.

Amongst EU member countries in 2004, the United Kingdom had the largest credits and Ireland the largest debits in R&LF. France and Sweden reported an excess of receipts over debits while Germany, the Netherlands, Italy and Austria reported a deficit in these transactions. In the case of Germany, a marked reduction of this deficit can be observed between 2000 and 2004, as debit payments stagnated while credits recorded a steep increase. The steepest increase in R&LF payments could be observed in the ten new EU members, which have benefited from a marked increase in FDI inflows since 1995. Japan was the world's third largest source and receiver of R&LF payments throughout the 2000-2004 period. Japan's deficit in R&LF transactions during 2000-2002 turned into a moderate surplus from 2003 onwards. In 2004, its total receipts of R&LF increased by 28 per cent to US$15.7 billion. Asian economies accounted for the largest part of developing countries' R&LF payments (in particular Singapore; China; Republic of Korea; Chinese Taipei; Thailand; Hong Kong, China and Malaysia). A strong multinational corporation presence exists in these economies. Among this group, only the Republic of Korea recorded a substantial increase in its receipts of R&LF between 2000 and 2004 (which is most likely related to its FDI outflows in the electronic sector). In 2004, the Republic of Korea recorded R&LF receipts of US$1.8 billion – by far the largest receipts of any developing country – and three times more than in 2000. Throughout the 2000-2004 period, Singapore reported the second largest payments of R&LF in Asia.[27] Its payments of US$5.6 billion in 2004 exceeded those of Canada for the first time, and nearly matched those of Germany. As Singapore's receipts of R&LF are much smaller than its debit payments, its deficit in these transactions is second globally only to that of Ireland. Having more than tripled since 2000, China's R&LF payments reached US$4.5 billion in 2004. India's payments of R&LF increased markedly between 2000 and 2003, but at only US$0.42 billion, remained relatively small compared to the size of its economy, and with those of Singapore and China.

[27] Singapore has revised its BOP statistics recently. Singapore R&LF data above are taken from Singapore Department of Statistics, Economic Survey of Singapore, Second Quarter 2005.

Table 1
Receipts and payments of royalties and licence fees of selected countries, 1995-2004
(Billion dollars)

	1995	2000	2001	2002	2003	2004
	A Payments					
World	52.8	85.7	86.5	94.5	109.3	130.0
EU (25)	24.2	33.4	34.3	36.8	46.3	52.9
United States	6.9	16.5	16.5	19.3	19.4	23.9
Japan	9.4	11.0	11.1	11.0	11.0	13.6
Canada	1.9	3.8	3.8	4.1	5.1	5.5
Singapore	1.7	4.2	3.4	3.6	4.8	5.6
Korea, Rep. of	2.4	3.2	3.1	3.0	3.6	4.5
China	...	1.3	1.9	3.1	3.5	4.5
Chinese Taipei	0.9	1.8	1.5	1.7	1.7	1.7
Australia	0.9	1.0	0.9	1.0	1.3	1.4
Thailand	0.6	0.7	0.8	1.1	1.3	1.6
Memorandum item:						
EU (15)	23.9	32.3	33.3	35.5	44.7	50.6
	B Receipts					
World	55.5	81.7	79.4	86.2	97.8	116.0
EU (25)	15.7	21.2	20.8	23.2	27.8	35.8
United States	30.3	43.2	40.7	44.5	48.1	52.6
Japan	6.0	10.2	10.5	10.4	12.3	15.7
Canada	0.4	2.3	2.4	2.4	2.9	3.0
Singapore	0.1	0.1	0.1	0.2	0.2	0.2
Korea, Rep. of	0.3	0.7	0.9	0.8	1.3	1.8
China	...	0.1	0.1	0.1	0.1	0.2
Chinese Taipei	0.2	0.4	0.3	0.3	0.2	0.3
Australia	0.2	0.4	0.3	0.3	0.4	0.5
Thailand	0.0	0.0	0.0	0.0	0.0	0.0
Memorandum item:						
EU (15)	15.6	21.0	20.6	22.7	27.3	35.1

Note: Ranked according to the largest sum of receipts and payments. Switzerland does not report its receipts and payments of R&LF but it is estimated that its receipts and payments would place it among the top ten.
Source: IMF, Balance of Payments Statistics (CDROM January 2006); Eurostat, national statistics and WTO estimates.

It is estimated that R&LF payments of South and Central America decreased from their peak level of nearly US$3.5 billion in 2000, to about US$3 billion in 2003, before recovering in 2004. The evolution of R&LF payments largely mirrors the economic woes of the region at the beginning of the present decade. R&LF payments of Brazil declined somewhat between 2000 and 2004 and amounted to US$1.2 billion at the end of the period. In marked contrast to Brazil, Mexico's R&LF payments doubled between 2000 and 2004, but at US$0.8 billion, still remained well below those of Brazil.[28] The outstanding development of Russia's R&LF payments, which reportedly increased more than tenfold between 2000 and 2004, to US$1.1 billion in 2004, is most likely due both to the recovery in the economy and to improved statistical recording.

Information on R&LF payments and receipts of countries in Africa and the Middle East is scattered. Based on partner statistics and selected national data, it appears that these regions' transactions are highly concentrated on two countries – Israel and South Africa. While Israel is the only developing country which reports a modest surplus in its R&LF transactions, South Africa recorded a deficit of US$330 million in 2004. Partner statistics suggest that R&LF payments of Africa and the Middle East combined accounted for less than 1.5 per cent of global payments in 2003. The corresponding share in receipts was less than one per cent (about 0.7 per cent).

[28] The United States reports R&LF receipts from Mexico in the order of US$1.222 billion in 2003, which was 50 per cent more than Mexico's reported payments to the world. It is assumed that Mexican BOP statistics are underreporting the actual flows.

The EU(15), Japan and the United States provide a regional breakdown of their BOP data which allows reporting of receipts (and debits) of R&LF from African countries. These three traders combined received annual R&LF payments from Africa of between US$600 million and US$800 million throughout the 2000-2003 period, while their payments ranged between US$60 million and US$180 million. The dollar value of R&LF receipts (and payments) of the three traders from (to) African countries in 2003 was roughly the same as in 2000.

In summing up, the findings above confirm that the United States maintains a leading position in the receipts of R&LF, although it is less dominant than a few years ago. Its payments of R&LF exceed those of the EU(25) to third countries, indicating that the United States is at the same time an important source of receipts of R&LF for other countries. Japan, the United Kingdom, France and Sweden each report an excess of credits over debits of between US$1 billion and US$2.2 billion, while almost all other traders record a deficit.[29] East Asian economies have markedly increased their share in debit payments during the 2000 to 2004 period, while the share of the other regions (i.e. CIS, South and Central America, Africa, Middle East and South East Asia) remained very small. The marked rise of R&LF payments by certain East Asian developing economies largely reflects their enhanced integration into global production networks.

[29] Switzerland's BOP statistics do not report credit and debit flows of R&LF. It is estimated that Switzerland is among the top ten traders in respect to credit and debit payments of R&LF.

3. DEVELOPMENTS IN LDC TRADE

A number of studies have highlighted the crucial importance of international trade to the development prospects of Least-Developed Countries (LDCs).[30] While most of these studies emphasize the role played by exports and market access, some also highlight the benefits of trade liberalization and the importance of import competition. The overall trade performance of LDCs has been quite poor, although prospects for improvement are getting brighter. The purpose of this Section is to review two recent developments related to LDCs exports – the growth of developing countries as markets for LDC products and prospects for achieving duty-free and quota-free market access for products originating from LDCs. The latter was an important issue at the Sixth WTO Ministerial Conference held in Hong Kong, China, in December 2005.[31] The Section starts with an overview of developments in LDC exports.

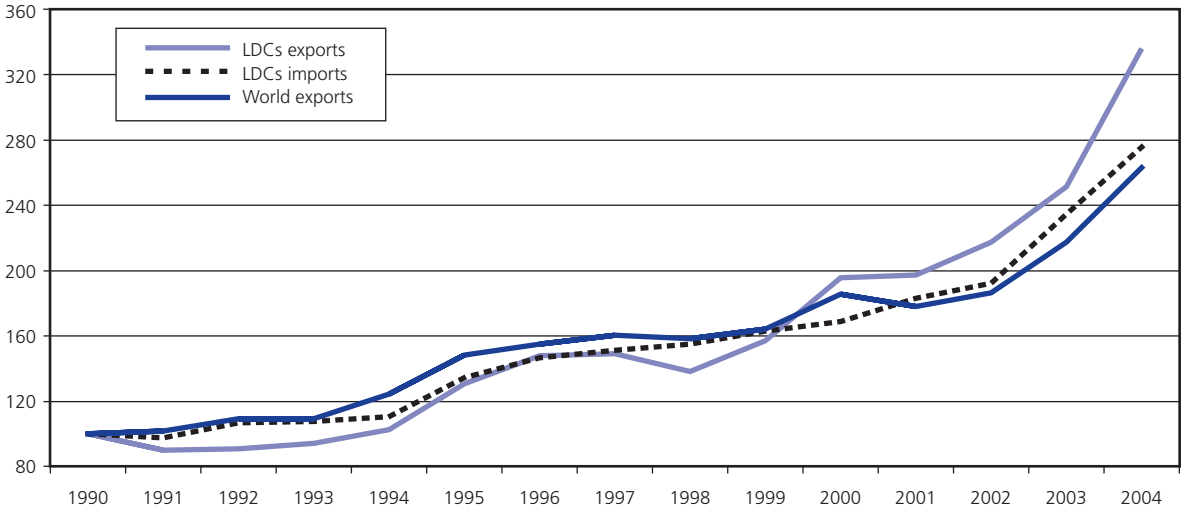
(a) Trade performance

Much has been made of the low share of LDCs in world trade. In 2004, LDCs as a group accounted for only 0.6 per cent of world exports and 0.8 per cent of world imports. In growth terms, their performance over the past 15 years has been mixed (see Chart 8). Between 1990 and 1998, LDC export growth was less than that of world exports, but since then this has been reversed, with LDC export growth exceeding world export growth.

Export growth for LDCs as a group in 2004 was significant, amounting to 34 per cent, compared to 21 per cent for world exports. This figure, however, masks considerable variance in the performance of individual LDCs in relative and absolute terms. The reality is that only a small number of LDCs have contributed to the expansion. These are the countries that can be classified as oil exporters, which accounted for 47 per cent of total LDCs exports. They experienced a growth rate of 52 per cent, whereas the values for manufacturing exporters and commodity exporters were 19 per cent and 22 per cent respectively. Eight LDCs experienced negative growth rates.

The diversity in export performance across countries is also significant. Two LDCs accounted for 36 per cent of all LDC exports in 2004 – Angola, which is a fuel exporter, and Bangladesh, which is predominantly a clothing exporter. To a significant degree, the performance of these two countries determines the overall

Chart 8
LDC merchandise exports and imports, 1990-2004
(Indices 1990 = 100)



Source: WTO.

30 The United Nations Conference on Trade and Development Least-Developed Countries Report series is a useful source for general material on LDC trade issues. The series can be accessed at www.unctad.org.

31 It should be noted that duty-free and quota-free market access is one of many trade issues confronting LDCs. Preference erosion arising from reductions in most-favoured-nation tariff rates is an important issue for some LDCs. Other important issues include the role of non-tariff barriers in frustrating market access opportunities for LDCs, and the challenge of developing supply capacity.

export performance of the LDCs as a group. In contrast, the 13 bottom-ranked LDCs in terms of export value account for less than 1 per cent of total LDC exports. Many of the latter posted negative growth rates and given their lack of size, the countries with positive growth rates did not have much of an impact on the aggregate figure. Such diversity in the export profiles of LDCs calls for extreme caution in generalizing policy prescriptions about LDCs as a group.

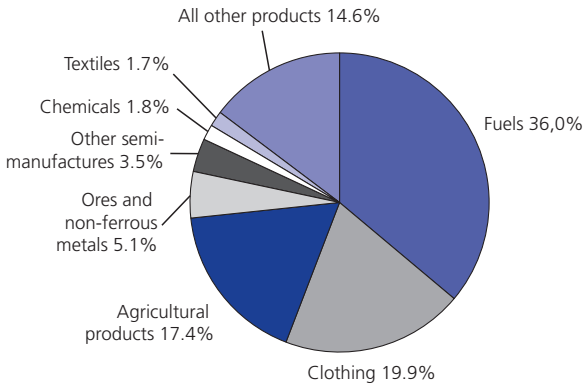
(b) LDC export profile

LDC merchandise exports have three distinct characteristics – a narrow range of products, a lack of diversification of export markets and low technology content.[32]

Over the last decade fuels have sharply increased their share in LDC merchandise exports. In 2003 they accounted for 37 per cent of the total value of all LDC exports (Chart 9). The second and third largest categories in that year were clothing and agricultural products. The latter category was the most prominent category in LDC exports in 1995.

In terms of market concentration, the EU(15) and the United States absorb the majority of LDC exports (Table 2). In 1995 their share was almost 60 per cent. By 2004 this figure had dropped to 52 per cent, but the dramatic increase in LDC exports to China has resulted in the top three markets (China, EU and the United States) accounting for 69 per cent of total exports. Table 2 also shows the importance of developing countries as markets for LDC exports. Six of the top ten markets are developing countries and developing countries accounted for 41 per cent of total LDC exports in 2004. In 1995 this figure was only 32 per cent.

Chart 9
LDC merchandise exports by product group, 2003
(Percentage share)



Source: WTO.

Table 2
Share of major markets in LDCs merchandise exports, 1995-2004

Rank		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1	EU (15)	39.6	36.9	34.9	37.3	34.6	31.1	33.4	32.8	30.6	29.2
2	United States	20.5	21.5	22.8	23.5	24.7	26.4	25.6	23.8	24.8	22.7
3	China	3.5	4.2	6.1	3.5	4.9	10.7	7.7	8.7	13.5	17.8
4	Thailand	3.9	3.5	3.8	3.1	3.8	3.7	4.9	4.9	5.1	5.0
5	Japan	6.5	6.4	4.7	4.0	3.6	3.3	2.9	4.0	3.4	4.2
6	India	2.7	2.6	2.7	3.0	4.1	2.5	3.4	3.3	3.1	2.9
7	Chinese Taipei	1.7	2.4	1.5	2.2	2.0	1.8	1.9	2.2	2.2	2.9
8	Korea, Rep. of	2.8	2.5	3.8	2.0	4.8	4.9	2.6	2.5	1.9	1.8
9	Canada	0.9	1.2	1.0	1.0	0.8	0.8	0.9	1.0	1.7	1.5
10	Singapore	2.8	2.2	1.5	2.7	2.0	1.6	1.9	1.4	1.1	1.2

Note: India's trade returns do not provide a full breakdown of oil imports by origin which leads to an under-reporting of its imports from LDCs.
Source: UNSD, Comtrade data base and WTO.

China is not the only developing country market to increase in importance. Thailand and Chinese Taipei have also done so, while India and the Republic of Korea have roughly maintained their shares. The importance of developing countries as markets is also underlined by the fact that they account for more than 50 per cent of the exports of 17 LDCs.

[32] This picture is somewhat modified if one includes services trade.

The poor quality of trade data for LDCs prevents a thorough analysis of the composition of LDC exports to developing country markets. In general, however, as is the case for LDC trade overall, export values are dominated by oil. It is the principal import for China, Thailand and India, the three largest developing country markets.

(c) Market access issues

The growing importance of developing countries as markets is an important development in terms of trade policy conditions. LDCs have historically been dependent on preferential market access to developed country markets. Developing countries, in contrast, do not have extensive non-reciprocal preferential programmes for LDCs. Some LDCs, however, obtain reciprocal market access through trade agreements with developing countries. An example of such a scheme is the Association of South East Asian Nations and their preferential trading agreement, which includes Cambodia and Laos.

According to 2003 data, 27.6 per cent of total LDC exports remain dutiable. Developed countries account for 61 per cent of this total and accordingly developing countries account for the remaining 39 per cent. The figure for duty-free access into developed countries is 72 per cent, which is almost identical to the figure for duty-free access into developing countries.

Achieving duty-free and quota-free market access in developed country markets for all products originating from LDCs has been an aspiration of the international community for some time.[33] To date, however, this objective has yet to be reached, despite the increased impetus arising from the Millennium Development Goals. The status quo in terms of duty-free imports in major developed country markets is reported in Table 3.

In contrast to other developed countries, Japan and the United States maintain positive duties on a significant share of LDC exports (Table 3). For Japan, however, 90 per cent of the dutiable figure is imports of oil, which attract an ad valorem equivalent duty of less than one per cent. Further analysis of the US situation shows that six LDCs (Bangladesh, Cambodia, Lao, Maldives, Myanmar and Nepal) accounting for 37 per cent of the total imports, also account for 92 per cent of total dutiable imports.

Table 3
Duty free imports originating from LDCs in developed markets, 2003

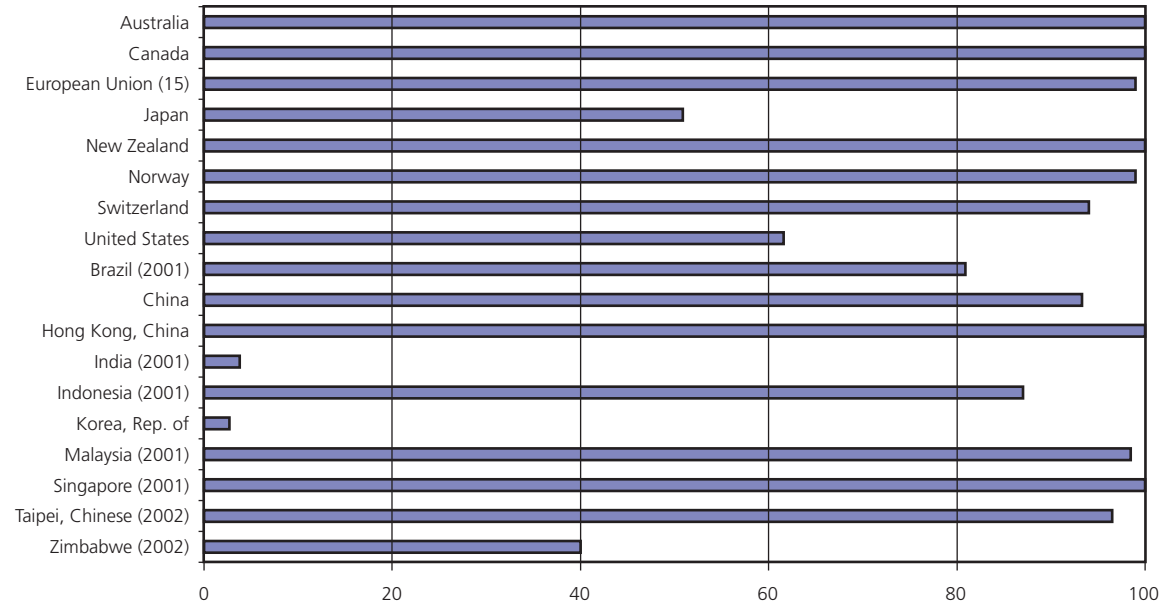
Market	Number of tariff lines					Imports (million dollars)		
	MFN		LDCs			World	LDCs	
	Total	With imports	Dutiable	With imports	Dutiable imports		Total	Per cent duty-free
Australia	6102	5686	0	655	0	84366	123	100.0
Canada	8497	8292	97	1569	1	234984	739	100.0
EU (15)	10404	10115	67	3517	19	992010	13705	99.2
Japan	9296	8204	1350	776	89	376941	1563	50.9
New Zealand	7414	6559	59	521	3	18439	31	99.9
Norway	7165	6517	0	509	0	39765	81	100.0
Switzerland	8477	7809	1167	818	47	96177	121	96.7
United States	10496	10123	1911	1421	581	1196833	10489	61.6

Source: WTO.

[33] Paragraph 42 of the Ministerial Declaration of the 4th WTO Ministerial Conference states "We commit ourselves to the objective of duty-free, quota-free market access for products originating from LDCs".
Paragraph 68(h) of the Programme of Action for LDCs, which was endorsed at the Third UN Conference on Least Developed Countries states that "Improving preferential market access for LDCs by working towards the objective of duty-free and quota-free market access for all LDCs' products. This will apply in the markets of developed countries."
Paragraph 34 of the International Conference on Financing for Development (Monterrey Consensus) states that "We call on developed countries that have not already done so to work towards the objective of duty-free and quota-free access for all least developed countries' exports, as envisaged in the Programme of Action for the Least Developed Countries adopted in Brussels".

Chart 10 charts the percentage of imports duty free into developed country and major developing country markets. India and the Republic of Korea stand out as two countries with large imports from LDCs, but very low duty-free figures. Unfortunately, India's data is for only 2001, hence may underestimate any initiatives that they have undertaken after that year, including MFN liberalization. Unfortunately, data for Thailand later than 1999 is not available.

Chart 10
Share of imports originating from LDCs entering duty free in selected markets, 2003
(Percentage)



Source: WTO.

In order to correct for the lack of recent data, a weighted average tariff rate for key developing country markets was calculated using average LDC exports from 2001-2003 as the weight. This procedure measures the bias in the tariff structure of a market towards LDC exports. Results from this procedure show that in general, despite the high MFN tariffs in developing country markets, only India's tariff structure shows some bias against LDCs. India's weighted average tariff rate using all imports as the weight is 24.5 per cent, but this rises to 27.3 per cent if LDC trade figures are used as the weight. In contrast, the similar value with LDC exports as the weight for Brazil, China, Chinese Taipei and the Republic of Korea are respectively, 2.0 per cent, 6.6 per cent, 2.3 per cent and 4.9 per cent, which are all lower than the average if imports from all trading partners is used as the weight.

The situation in developing country markets is dominated by China (Table 2). Based on 2003 data, 93.3 per cent of LDC exports to China enter duty free. If oil imports are deducted, the duty free figure becomes 48.4 per cent. In September 2005, China announced new measures in favour of LDCs. The estimated impact of these measures is to increase the total duty-free figure from 93.3 per cent to 95.2 per cent, and the non-oil figure rises from 48.4 per cent to 62.3 per cent.

LDC issues were a core part of the agenda at the Sixth WTO Ministerial Conference held in Hong Kong, China in December 2005. Annex F of the Ministerial Declaration commits developed WTO Members to achieving duty-free and quota-free market access for all products originating from all LDCs by 2008. Members facing difficulty in achieving this objective must meet a target of a minimum of 97 per cent of all products, defined at the tariff line level. Ministers did not accept proposals to bind existing and new unilateral market opening measures within the WTO legal system. WTO Members are currently assessing the extent to which Annex F can be translated into substantial improvements in market access

(d) Summary

Market and product concentration have traditionally characterised the export structure of LDCs. The EU and the United States continue to be the most important markets for their products and oil continues to dominate LDC exports in value terms. An interesting trend is the growing importance of developing countries, led by China, as markets for LDC products. This development is expected to have some impact on the issue whether only developed countries should be required to concede non-reciprocal market access to products from LDCs.

The data presented above suggest that there are still gains to be reaped from efforts by developed countries to achieve complete duty-free and quota-free market access for LDC exports on a non-reciprocal basis. This is particularly so in the case of the United States, whose current treatment of LDC exports offers limited benefits to Asian LDCs. Similarly, Japan also retains a relatively high proportion of duties on non-oil imports from LDCs.

At the same time, MFN negotiations are important, since the level of preferential (reciprocal and non-reciprocal) imports from LDCs into developing country markets is negligible. Reductions in MFN duties from which LDCs would benefit could be addressed within the agriculture and non-agriculture negotiations. However, some developing countries have argued in favour of expanding trade preferences among developing countries through the Global System of Trade Preferences (GSTP). A new round of GSTP negotiations was launched at UNCTAD XI in Brazil in 2004. Prospects for achieving improved market access within the context of this process would appear to be limited. Despite the press coverage and confidence shown by many developing countries in the GSTP negotiations, the reality is that the process has yet to start. Unilateral initiatives such as that announced by China in September 2005 could provide a more expeditious mechanism for enhancing market access for LDC exports in developing countries.

4. THE IMPACT OF NATURAL DISASTERS AND TERRORIST ACTS ON INTERNATIONAL TRADE FLOWS

This Section deals with the repercussions of natural disasters and terrorism on international trade flows. Two large natural disasters struck recently, one in December 2004 and the other in August 2005, causing devastation on opposite sides of the globe. The Indian Ocean tsunami devastated countries in Southeast Asia, South Asia and Africa, leaving hundreds of thousands dead. Although, it caused less fatalities than the tsunami, Hurricane Katrina was perhaps the most expensive natural disaster to ever to hit the United States, and sufficiently huge to cause tremors in global energy markets. Last year also saw several major international terrorist actions – the London tube and bus bombings of 7 and 21 July 2005 and the Bali bombing on 1 October 2005. While they claimed fewer human lives and caused less direct economic damage than the tsunami or the hurricane, these acts of terrorism illustrate the persistent menace that confronts the international community.

(a) Impact of recent natural disasters

The Indian Ocean tsunami, spawned by a huge earthquake that shook the north western coast of Sumatra on 26 December 2004, is estimated to have caused the deaths of about 170,000 to 250,000 people.[34] It left over a million people displaced. The tsunami created a huge swathe of destruction stretching across the expanse of the Indian Ocean affecting 12 countries – Bangladesh, India, Indonesia, Kenya, Malaysia, Maldives, Myanmar, Seychelles, Somalia, Sri Lanka, Tanzania and Thailand. The estimates place the value of the physical damage at about US$8 billion. During the middle of the hurricane season in North America, the United States was hit by one of the most destructive tropical cyclones in its history. Hurricane Katrina caused breaches in the levees protecting New Orleans, flooding most of the city and causing the evacuation of its entire populace. The hurricane also brought extensive damage to the coastal regions of Louisiana, Mississippi, and Alabama. Damage is expected to be in the vicinity of US$130 billion with the death toll estimated at about 1,300.

Not many systematic analyses exist of the economic effects of disasters. What is available has attempted to distil lessons or patterns based on evidence from past disasters (Hirschleifer, 1991; OECD, 2003). This literature suggests that the economic rebound from even a large disaster can be very rapid if social institutions, human capital and productivity are kept intact. Communities at the centre of the disaster can adapt.[35] Demand shifts away from less essential wants to more basic needs, freeing up resources for search, rescue and rehabilitation. Existing resources (labour and capital) can be worked longer and deployed to meet essential requirements. Outside assistance, from the wider domestic society or from the international community, may be counted on to provide additional resources for emergency relief and for recovery. The existence of insurance markets can spread the costs of the disaster more widely across society so that the local community, which may have been at the epicentre of the devastation, does not bear the full brunt of the disaster.

The role of government in disasters is important. Governments must be prepared to mitigate the economic and social impact of disasters; maintaining the public's trust and confidence are key ingredients of recovery. The government's role includes taking precautionary measures, which in the long run is cheaper than providing emergency aid. These measures include safeguarding basic infrastructure, emergency planning, informing the public about the potential risks, and taking these risks into account in property development projects. However, public action also needs to be circumscribed so that it does not displace private initiative. Public response in certain emergencies may also raise issues regarding moral hazard. That is, if governments can be counted on to be the relief provider of last resort, then people may be more willing than otherwise to take long-term risks, for example, building their communities on a flood plain.

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34 United Nations Office for the Coordination of Humanitarian Affairs, accessed on 11 November 2005. http://ochaonline.un.org/webpage.asp?ParentID=10156&MenuID=10161&Page=2041

35 But see Skidmore and Toya (2002) who argue that there are long-run effects on macroeconomic growth from the occurrence of natural disasters. Paradoxically, they conclude that countries that are the subject of frequent climatic disasters experience higher rates of human capital accumulation, total factor productivity and economic growth. The reason for this is a substitution towards investment in human capital as physical capital faces increased risk of damage or destruction.

Overall, the literature suggests that while aggregate economic activity may fall somewhat in the short term, reconstruction activity which boosts expenditures can mitigate or even reverse the initial fall. Sectors of activity are affected differently by large-scale disasters. The construction sector may benefit even as other sectors, such as the insurance industry, suffer from the disaster. Finally, while the local impacts of a disaster are often very large, its effects are fairly small if viewed at the national level.

The impact on international trade flows depends on how large the tradable sector is in the devastated area and how integrated it is with the global economy. At the national level, there could be additional indirect effects if macroeconomic activity weakens as a consequence of the disaster. Exports may fall because the physical damage caused by the disaster severely disrupts production in some major export sectors. Production facilities may be shut down, important inputs may be in short supply, major utilities may be disrupted or there could be transportation bottlenecks. However, imports may rise to make up for the shortage in local production. And reconstruction efforts may also require a significant amount of foreign goods or services which would tend to increase imports. These would tend to dampen the contractionary effect of a disaster on international trade. Overall, the impact of a disaster on international trade will tend to be localized and temporary. Certainly, based on recently observed natural disasters, there are unlikely to be permanent impacts that affect comparative advantage or change the pattern of trade.

(i) The Indian Ocean tsunami

Table 4
Estimated impact of tsunami on economic growth, 2005
(Percentage)

Country	Forecast of GDP growth	
	Pre-tsunami	Post-tsunami
India	6.8	7.1
Indonesia	5.5	5.8
Maldives	6.5	1.0
Sri Lanka	6.0	5.3
Thailand	5.9	3.5

Source: IMF (2005) and World Economic Outlook Database.

The Indian Ocean tsunami badly affected five countries: India, Indonesia, Maldives, Sri Lanka and Thailand. Comparing the pre-tsunami and post-tsunami macroeconomic forecasts made by the IMF (Table 4), the expected impact on macroeconomic growth will be modest.[36] Only in the case of the Maldives, the smallest of the affected countries, is growth expected to decline significantly in 2005 as a result of the tsunami (from the pre-tsunami forecast of 6.5 per cent to 1 per cent). However, both India and Indonesia are foreseen to experience higher growth in 2005 even after the disaster. Although, the post-tsunami forecasts of economic growth in Sri Lanka and Thailand are lower, this is largely because of other economic factors that are weighing on growth (e.g. higher oil prices).

The damage from the tsunami was largely confined to coastal and rural areas rather than urban commercial centres and industrial hubs. So the direct economic impact in this case is concentrated in tourism and fishing. But there are likely to be secondary effects because of inter-industry links and because government expenditure has to be diverted from other uses. The size of these secondary effects greatly depends on the structure of economies and on their resilience.

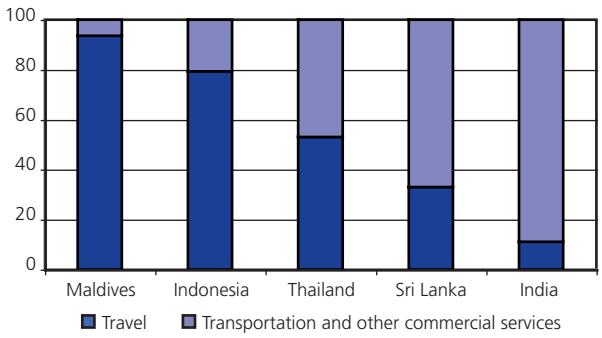
The tsunami has not had a discernible impact on global or regional trade given that many of the coastal communities devastated by the tsunami were not significantly integrated into the global economy. Merchandise trade has continued to grow in 2005 in four of the most affected countries. India's nominal imports are forecast to expand by more than 20 per cent and its exports to grow by 14 per cent in 2005.[37] Thailand's merchandise exports grew by 12.5 per cent during the first half of 2005, faster than projected, while imports surged by 32.5 per cent, mainly because of higher prices for imported oil. The major exception to this is the Maldives, where as a result of a sharp reduction in tourism earnings (see below) the current account deficit is expected to reach nearly a quarter of GDP in 2005.

[36] IMF (2005) *World Economic Outlook*, March.

[37] Asian Development Bank (2005) *Asian Development Outlook 2005 Update* (Manila: ADB).

But tourism has been affected because of the damage to tourism facilities. Travel and tourism make up a substantial part of the commercial services exports of Indonesia, the Maldives, Sri Lanka and Thailand.[38] In 2004, it accounted for 31 per cent of Sri Lanka's commercial services exports; 52 per cent of Thailand's; 78 per cent of Indonesia's; and 94 per cent of Maldives' services exports (Chart 11).

Chart 11
Commercial services exports of tsunami affected countries by sector, 2004
(Percentage share)



Source: IMF, Balance of Payments Statistics and WTO, International Trade Statistics, 2005.

The initial forecast from the World Travel and Tourism Council was a reduction of between 20 per cent to 30 per cent in tourism receipts for Maldives, Sri Lanka and Thailand.[39] But the latest assessment from the World Tourism Organization paints a less gloomy picture.[40] For the first nine months of 2005, international tourism arrivals actually increased by 8 per cent in Sri Lanka compared to the same period in 2004. In the case of Thailand, for the first six months of 2005, international tourism arrivals were only down by 6 per cent although the major resorts in the Andaman Sea like Phuket, which suffered the brunt of the disaster, were down by over 60 per cent. Only in the case of the Maldives has the impact been severe. International tourist arrivals are 41 per cent lower than during the first ten months of 2004. In all these destinations, the main constraint does not appear to be a reluctance of foreign tourists to return to the region; rather the pace of reconstruction has lagged the resurgence in demand. There are 6,000 fewer rooms available this season in Thailand's Andaman Sea resorts, the Maldives is still down by more than 3,000 beds and several of Sri Lanka's large beach resorts remain closed for extensive renovations. Recovery of international tourism arrivals to pre-tsunami levels is not expected until the next winter season (2006/2007).

(ii) Hurricanes Katrina and Rita

The combined losses from Hurricanes Katrina and Rita are likely to even be larger than the damage wrought by Hurricane Andrew and the 11 September 2001 terrorist attacks (Box 2). Based on estimates by the US Congressional Budget Office (CBO, 2005), the value of capital stock destroyed by Katrina and Rita will total between US$70 billion and US$130 billion. The CBO also expects a loss of between 293,000 and 480,000 jobs in the affected areas.

Box 2: Hurricanes in the United States

Hurricanes or tropical storms are a major cause of weather-related disasters in the United States. The National Climactic Data Center of the US Department of Commerce has identified 62 weather-related disasters since 1980 in which overall damages and costs reached or exceeded US$1 billion at the time of the event ('billion-dollar disasters'). The total damages from these disasters exceeded US$390 billion in 2002 dollars. Nearly a third of these billion-dollar disasters have been wrought by hurricanes. Hurricane Andrew, which devastated Florida in 1992, was, before Hurricane Katrina, the worst storm in US history causing damages estimated at US$35.6 billion in 2002 dollars.

38 Trade in commercial services is an important part of the economies of the five most affected countries. In the case of Maldives for example, commercial services exports in 2004 were more than four times the size of its merchandise exports that year. For the other four countries, the value of commercial services trade is between one-fourth and one-half of the value of their merchandise trade.

39 World Travel and Tourism Council (2005) *Global Travel & Tourism Poised for Continued Growth in 2005 and Tsunami Impact on Travel & Tourism is Significant but Limited,* 8 April.

40 World Tourism Organization (2005) *Post Tsunami Re-Assessment: Growing Demand, Limited Supply* http://www.world-tourism.org/tsunami/eng.html.

Some recent studies (Emanuel, 2005; Faust, 2005) document what appears to be the increasing destructiveness of hurricanes in the United States. There are two main explanations for this trend – more destructive hurricanes and economic, social and demographic changes. Emanuel constructed an index of the potential destructiveness of hurricanes, known as total power dissipation, and showed that this index has increased markedly since the mid-1970s. The economic and social factors which have contributed to the increasing likelihood of billion dollar losses include the growth of wealth which puts more valuable property at risk, increasing density of property, and demographic shifts to coastal areas and storm-prone areas that are experiencing increasing urbanization (Kunkel et al., 1999).

Although the economic effects of major natural disasters tend to be transient, this does not diminish the human tragedy that attends them. How well authorities respond to natural disasters has an important bearing on the extent and severity of the suffering and the costs. Some disasters leave social and political impacts that reverberate years after the event. The great Mississippi flood of 1927 brought not only disaster to the peoples of Mississippi and Louisiana, but in spreading the costs so inequitably, uncovered deep social and racial divides. The events surrounding the flood were said to have brought about the populism of Huey Long, the election of Herbert Hoover to the White House in 1928 and the acceleration of the migration of American blacks to the industrial cities of the north (Barry, 1997).

Given the damage caused by the hurricanes, the CBO had initially estimated that US economic growth in the third quarter of 2005 could be shaved by between 1 and 1.5 percentage points. The CBO estimates may have been too pessimistic. United States GDP growth was 4.1 per cent in the third quarter of 2005, nearly a full percentage point higher than in the second quarter.[41]

One of the immediate concerns was the impact on the energy sector, as nearly 2 per cent of global crude oil supply comes from the Gulf of Mexico. In the immediate aftermath of Hurricane Katrina, about 90 per cent of crude oil production and roughly 70 per cent of natural gas production from the Gulf of Mexico were shut down because of damage to platforms and pipelines. Damage from the hurricanes resulted in the loss of 3 million barrels a day of refining capacity (or nearly 20 per cent of the total US capacity). Crude oil prices jumped to over US$70 a barrel while gasoline prices in some parts of the United States surged past US$3 dollars a gallon. However, this peak was not sustained and oil prices have drifted downward from their levels in late August and early September.

But the temporary loss of petroleum production and refining capacity and other disruptions have had an impact on the volume and value of petroleum imports. Initial estimates of US trade in goods during the month of September 2005, for example, showed a surge in imports of natural gas, fuel oil and other petroleum products. On a seasonally adjusted basis, imports for these products in the month of September rose by 25 per cent (or by US$2.1 billion) over import figures in August. Crude oil imports, however, fell by US$350 million, reflecting the shutdown of refineries in the Gulf Coast because of damage from Katrina and later from Hurricane Rita.[42] Since the annual value of US imports exceeds US$1.4 trillion, the impact of Hurricanes Katrina and Rita would only be a temporary shock to US merchandise trade flows, and is unlikely to have an appreciable impact.

The hurricanes will also increase insurance and reinsurance claims received from foreign insurance companies.[43] This reflects that portion of the insured claims that is borne by the rest of the world. Based on data from the third quarter of 2005, the impact of Hurricane Katrina on international insurance claims was about US$9.7 billion.[44]

41 Bureau of Economic Analysis 'News Release: Gross Domestic Product and Corporate Profits: Third Quarter 2005 "final" estimates', 21 December 2005, BEA 05-57.

42 US Census Bureau and Bureau of Economic Analysis 'News Release: US International Trade in Goods and Services: September 2005, 10 November 2005, CB05-164, BEA 05-49, FT-900 (05-09).

43 These are reflected not in "other private services payments and receipts" but in the account on net unilateral current transfers. This is because of recent changes adopted by the US Bureau of Economic Analysis in its definition of insurance services. Insurance services are now measured as premiums less normal or expected (instead of actual) losses. Normal losses include the losses that occur regularly and a share of catastrophic losses that occur at infrequent intervals. See Bach (2004). As a consequence, claims received by US companies from foreign insurance companies that are in excess of normal or expected claims are reflected in the net unilateral current transfers account.

44 Bureau of Economic Analysis 'News Release: US International Transactions: Third Quarter 2005, BEA 05-54.

(b) Impact of recent terrorist events[45]

The terrorist attacks of 11 September 2001 (henceforth, "9/11") changed the way in which the global community perceives terror as a threat to national security. It has been realized that a terrorist incident can result in large-scale damage to both human and physical capital and can have permanent implications for economies across the globe. The commuter train bombings in Madrid of 11 March 2004 ("3/11"), the recent London tube and bus bombings of 7 and 21 July 2005 ("7/7" and "7/21") and the second Bali bombing on 1 October 2005 ("10/1") following the devastating attacks three years earlier underscore the vulnerability of all countries to terrorist attacks. International terrorism[46] appears to be one of the greatest concerns of the international community at present. Both the acts of terror themselves as well as the counter-terrorist measures taken in response to them have imposed costs on national economies and international trade. Besides the immediate losses, consumer and investment behaviour may change if insecurity persists due to repeated attacks. Resources may also be allocated differently across sectors, for instance out of tourism and travel and into defence, construction and security services. Finally, enhanced security measures entail higher transaction costs which may lead to changes in business relationships and trade patterns. Hence, the size of the impact on trading costs will vary across countries as a function of terrorist risks and the nature of security measures. A country's position in international trade may be permanently weakened if terrorist activities persist and security measures pose a burden on business travel, transport and investment. Conversely, isolated, "random" acts of terror that are quickly and effectively addressed may not result in any long-lasting economic consequences.

The most immediate costs of terror comprise the loss of human lives as well as injuries. The 9/11 attacks resulted in 2,982 fatalities and 2,337 injuries. In Madrid, 191 lives were lost with more than 1,500 people wounded; the London attacks counted 52 casualties (plus the 4 suicide bombers of 7/7) and 700 wounded; and the bombing in Bali in October 2005 resulted in 20 casualties (plus 3 suicide bombers) and 129 wounded. In addition to the immeasurable human tragedy, various business activities were brought to a temporary halt. In the immediate aftermath of 9/11, according to a study by Navarro and Spencer (2001), US$47 billion of economic output was lost. Insurance companies needed to pay US$11 billion for business interruptions (OECD, 2005). Companies incurred additional human capital costs for the rehiring and retraining of employees as well as for compensation payments related to the disaster. Finally, the restitution of destroyed infrastructure has taxed local authorities and insurance companies. In the three most recent events, these amounts were not anywhere close to the estimated US$25 to US$30 billion in physical assets that were lost on 9/11 (Lenain et al., 2002; Becker and Murphy, 2001).[47] With losses on 9/11 being equivalent to barely 0.2 per cent of total physical assets of the United States, it may be assumed that a large part of the economic consequences of the Madrid, London and Bali terrorist events, where physical damage was considerably smaller, may also stem from their indirect impacts. Certain industries, such as tourism, have been particularly affected.

Chart 12 shows the development of travel services exports for the United States and Indonesia. Both graphs show a marked downturn as of 2001 ("9/11") for the United States and 2002 for Indonesia (first Bali bombing). In both countries, travel services exports began to recover only in 2004. In 2003, Indonesia experienced a 23 per cent nominal decline in tourist arrivals (more than 25 per cent in real terms). However, tourism has quickly recovered from the plunge of 2003, when the number of foreign visitors fell to 3.3 million, the lowest level since 1995. In 2004, arrivals climbed to a record 5.1 million, bringing in US$4.8 billion in export revenues,

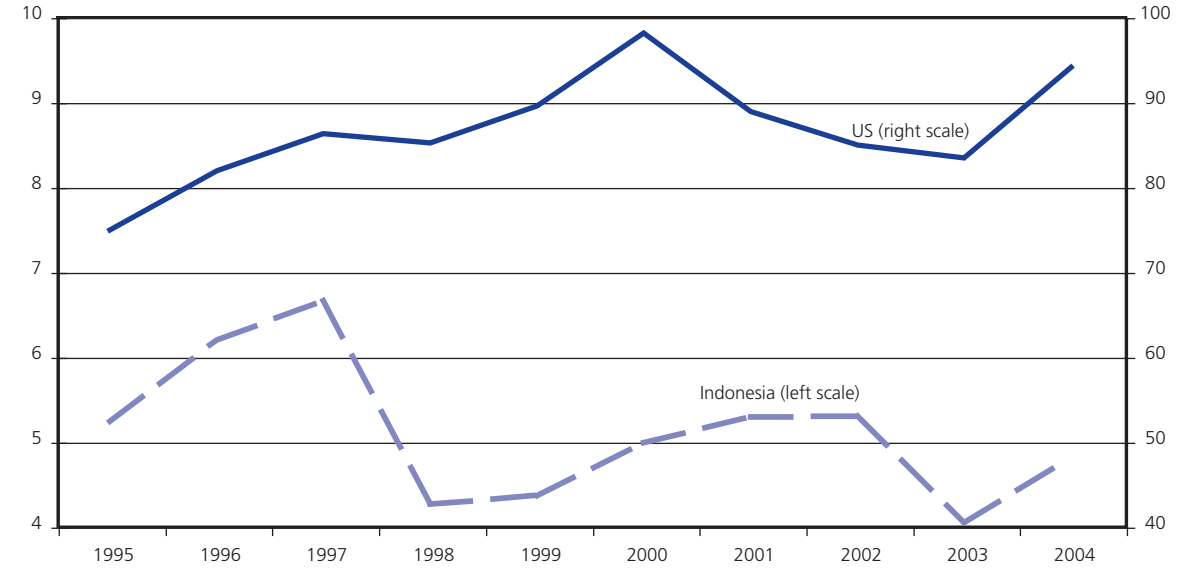
45 Data on the incidence of terrorism made available by RAND Corporation (in cooperation with the National Memorial Institute for the Prevention of Terrorism, MIPT) from the RAND Terrorism Chronology and RAND-MIPT Terrorism Incident Database provided invaluable background information for this Report. The full data set made available by RAND Corporation is further used to estimate the impact of terrorism on trade in Gassebner et al. (2006).

46 Simply put, international terrorism involves citizens or property of more than one country. For a comprehensive definition see Blomberg et al. (2004). Hence, in this essay, quasi-permanent domestic terror, for instance in Colombia, or outright civil wars in countries like Somalia are not the main focus.

47 Ward (2004) in adding economic cost estimations from a variety of sources of the 9/11 attacks on the World Trade Center, New York City, arrives at a total of US$146.8 billion to US$166.8 billion. This number includes estimated costs borne by individuals and families, wage-earner losses in New York City, insurance costs, travel-related losses, especially in the airline sector, losses to tourism, increased security costs, facilities and equipment, infrastructure costs, tax revenue losses in the fiscal year following the event and government bailout spending on airlines. For a review of studies on the economic impact of 9/11 see also US GAO (2002). On the US GAO website, detailed assessments can also be found, e.g. of the losses by the airline industry (GAO-02-133R) or the impact on tax revenues of New York City (GAO-02-882R).

an amount only US$400 million short of the post-Asian financial crisis peak in 2001. A similar downturn has not occurred after the 10/1 Bali incident (which also resulted in a lesser direct damage).[48] There is anecdotal evidence that, especially since London and Madrid, travellers have come to recognize that terrorists may strike in a variety of places and therefore are less prone to cancel their travel plans on an ad hoc basis. In the case of the Madrid train bombings, no major implications for international tourism have been detected. The decline in tourism revenue in Spain of about 2 per cent in 2004 was in line with the ongoing trend of lower visitor arrivals from principal countries of origin, such as the UK, which had experienced a depreciation of the pound versus the euro.[49]

Chart 12
Exports of travel services of the United States and Indonesia, 1995-2004
(Billion dollars)



Source: IMF, Balance of Payments Statistics.

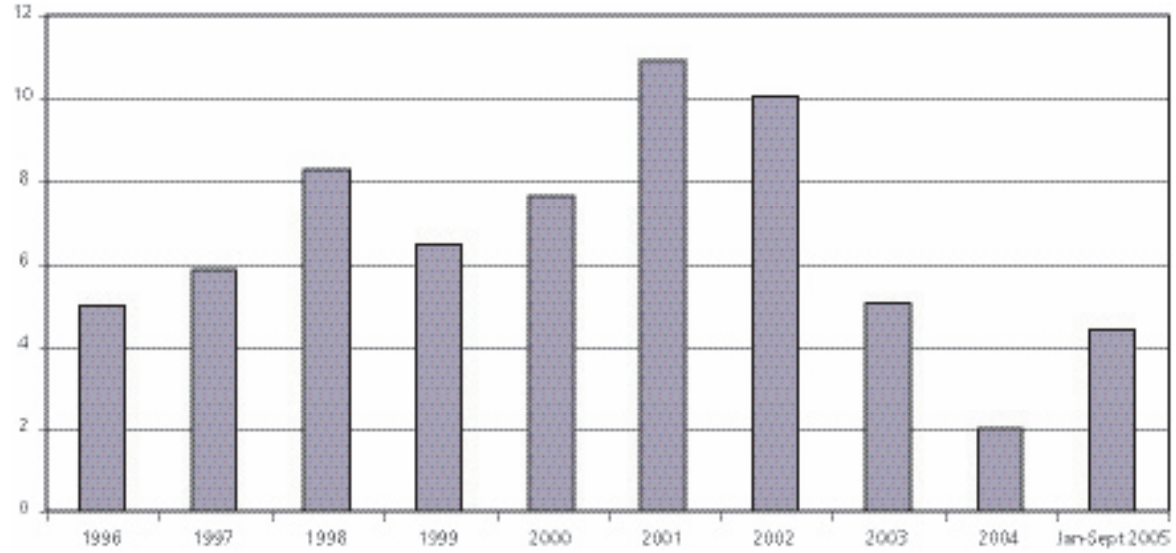
In the United States, the 9/11 events also led to sharply reduced enrolments by foreign students. Among the reasons for this is the real or perceived difficulties in obtaining student visas, which is a problem that has persisted. Chart 13 shows that revenue growth from education services exports by the United States decelerated after 2001, levelling out at only 2 per cent in 2004 after a 5 per cent increase in 2003. In 2004, the number of foreign students enrolled in higher education institutions in the United States dropped by 2.4 per cent, which largely offset increases in tuition rates. While the number of Indian students has continued to rise, this increase has been able only in part to compensate for lower student numbers from other countries, including China, other Asian countries, Europe and the Middle East. Especially in the latter region, the number of students from countries with majority Muslim populations, such as Saudi Arabia, Kuwait and Jordan, decreased at an average annual rate of 10 per cent beginning 2002 (Nephew et al., 2005). Owing to these developments, United States education services receipts from the Middle East, unlike from other regions, fell after 2001, from US$530 million in 2002 to US$481 million and US$445 million in 2003 and 2004 respectively.

Despite the multitude of influential factors, real growth developments following an event, as shown in Table 5, may give some crude support to the hypothesis that recent terrorist attacks have had temporary and less severe impacts than other political disruptions and supply-side shocks in the past, such as the oil crisis of the early 1970s. The 9/11 attacks and the first Bali bombing presumably had an immediate negative impact on quarterly performance. However, the economy had already recovered in the next quarter and both countries returned to healthy real growth rates during the 12 months following the attacks. No significant effects can be identified in the case of the Madrid and London attacks. In Spain, both consumer and business confidence remained fairly stable in March 2004 and increased thereafter. The situation is similar for the UK, where

48 See http://www.world-tourism.org/newsroom/Releases/2005/october/bali_tourism.htm, visited on 28 October 2005.

49 See http://www.euromonitor.com/Travel_and_Tourism_in_Spain, visited on 1 November 2005.

Chart 13
Exports of education services of the United States, 1996-2005
(Annual percentage change)



Note: Education services consist of expenditures for tuition and living expenses by students studying in foreign countries. Transactions are between unaffiliated parties.
Source: US Department of Commerce, Bureau of Economic Analysis website: http://www.bea.gov/bea/ARTICLES/2005/10October/1005_xborder.pdf

consumer spending has been weak for a variety of other reasons (Williams, 2005). In both countries, real exports showed no signs of a major decline either, with export volumes in the UK growing by 5.6 per cent in the year of the attack (2005, up from 3.9 per cent in 2004) and by 3.3 per cent in Spain (2004, slightly down from 3.6 per cent in 2003). These developments contrast with the 1973 oil crisis or the consequences of the failed assassination of US President Reagan in 1981, where a previously growing US economy registered negative real growth for a more extensive period of time.

Table 5
Real GDP growth following selected supply-side shocks
(Per cent)

Event	Reporting country	Date	Quarter of event[a]	Quarter after event[a]	One year after event[b]
London subway bombings	United Kingdom	7-Jul-05	3.8[c]	2.9[c]	n.a.
Madrid train bombings	Spain	11-Mar-04	3.2	3.1	3.3
First Bali bombing	Indonesia	12-Oct-02	-14.1	14.2	4.7
9/11 attacks	United States	11-Sep-01	-1.4	1.6	2.2
Iraq's invasion of Kuwait	United States	2-Aug-90	0.0	-3.0	0.0
Reagan assassination attempt	United States	30-Mar-81	8.0	-3.1	-2.5
OPEC oil embargo	United States	17-Oct-73	3.8	-3.5	-1.9

[a] Annualized rates.
[b] Average of annualized rates in the four quarters following the event.
[c] Expected values. See http://www.businessweek.com/investor/content/jul2005/pi20050711_5798_pi077.htm
Source: IMF, International Financial Statistics and authors' calculations.

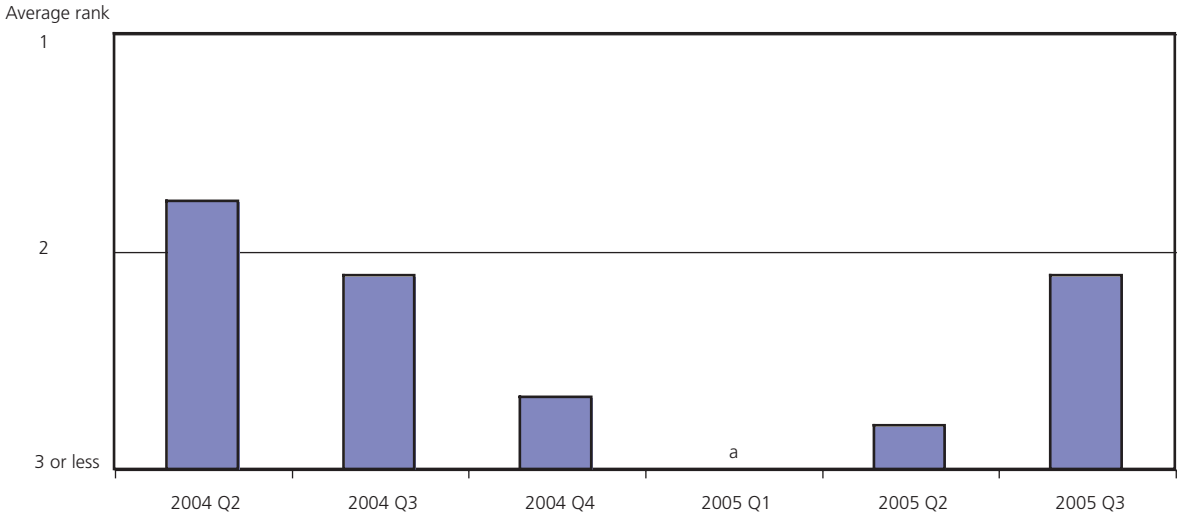
Whether the impact on an industry and the economy is a temporary or more permanent phenomenon mainly depends on the perception of continued terrorist risk and the nature of response measures. After the 7/7 London attack, the FTSE 200 Index fell approximately 200 points within the first two hours. By the end of the day it rebounded to a loss of about 70 points and regained its pre-bombing level on the following trading day. In contrast, following 9/11 stock market wealth was reduced by about US$1.7 trillion (Navarro and Spencer, 2001). Similarly, after the failed second London attack, the reaction was stronger. According to

the Association of British Travel Agents, following the 7/7 incidents, there has been no noticeable reduction in visitors to London or in forward bookings. However, the second event, albeit without major damage, created the feeling that a terrorist attack could be an ongoing threat rather than a one-time incident, leading to a reduction in visitor numbers in the future.[50] The Washington Post reports that retailers in central London have lost an estimated US$1.4 billion in sales as a result of the terror.[51]

If terrorism persists, output may be permanently affected. Abadie and Gardeazabal (2003) found for the Spanish Basque region that the long-lasting violent domestic conflict has been responsible for a 10 per cent reduction of per capita GDP and that changes in this measure are directly associated with the intensity of violent incidents. A large part of this permanent drop in output is due to the displacement of industries to safer regions. Such effects may not show at the national level and may not be relevant if terrorist activities remain relatively isolated events. A survey conducted by UNCTAD in November 2001 showed that only few major transnational corporations intended to delay or cancel investment projects for the next three to five years as a result of the 9/11 attacks (UNCTAD, 2001; Lenain et al., 2002). According to the Summer 2005 Duke University / CFO Magazine Business Outlook Survey for Europe,[52] only 10 per cent of the companies ranked terrorism among their top three concerns. Interestingly, the attacks of Madrid 2004 and London seem to have brought terrorism back on companies' radar screens. Chart 14 shows strong concern (i.e. an average rank closer to one) over terrorism in the second quarter of 2004 post-Madrid, fading away in the subsequent quarters only to reappear in the third quarter of 2005 in response to the London bombings. Overall, however, companies did not expect any impact of terrorism on their profitability in 2005, and three-quarters of the firms questioned had not taken any specific actions in response to the threat of terror.

At the country level a different picture emerges, with companies headquartered in certain countries, notably Greece, the Netherlands, Belgium, Spain and the United Kingdom, expecting some negative impact on profits. Similarly, a cross-sectoral breakdown shows that the threat of terrorism is considered a potential factor affecting a company's bottom line especially in the construction sector (probably positively) as well as in the insurance and transportation sectors (negatively). Less than half of the companies surveyed in the latter two sectors had not taken any special countermeasures in response to the perceived terrorist risk.

Chart 14
Terrorism as a major business concern, 2004-05[a]



[a] Terrorism not featuring as a major concern in the first quarter of 2005.
Source: Quarterly Duke University / CFO Magazine Business Outlook Surveys.

50 See http://news.bbc.co.uk/1/hi/uk/4706615.stm, visited on 10 November 2005.

51 See http://www.washingtonpost.com/wp-dyn/content/article/2005/08/15/ AR2005081500818.html. However, some of these sales are merely postponed.

52 See http://www.cfosurvey.org, visited on 9 November 2005.

The impact of the recent terrorist attacks on merchandise trade is mostly related to changes in transaction costs, mainly via higher insurance premiums and tightened security measures at borders, ports and airports. The overall impact of a given increase in transactions costs on a country's trade depends on its trade openness (i.e. its trade to GDP ratio), its principal trading partners, the composition of traded commodities and their respective modes of transport.

9/11 caused a damage of nearly US$80 billion, about US$32.5 billion of which was covered by insurance (OECD, 2005). As a consequence, insurance and reinsurance carriers imposed widespread terrorism exclusion clauses. The sudden tightening in the provision of terrorism insurance led to immediate adverse economic effects that were especially disruptive in economic activities most dependent on terrorism insurance, such as aviation, tourism, construction and commercial lending (OECD, 2005). Despite a subsequent increase in supply through private-public programmes, especially in the US following the Terrorism Risk Insurance Act (TRIA) of November 2002 (a three-year programme guaranteeing that certain terrorist-related claims will be paid), companies paid substantial premiums to replace the cover that had been withdrawn. However, by the end of 2004, rates had declined again with the median quarterly terrorism pricing running at slightly over 3.5 per cent of the property premium, down from the peak of almost 5 per cent half a year earlier. In 2004, the transportation sector, which has a key role in facilitating trade, faced lower than average terrorism pricing at 3 per cent of property premiums, about half the rate of, for instance, financial institutions and the real estate industry at 6.1 per cent (AON, 2004). Triggered by the 9/11 events and reinforced by the Madrid and London bombings, a range of private-public terrorism (re-)insurance schemes have been created by European and other OECD countries offering additional coverage layers in the hundred millions and billion dollars range.[53]

Recent terrorist events have led to a lasting step-up of security measures, resulting in longer delivery times, for instance owing to tighter inspections at border crossings.[54] Transaction costs have also increased due to additional security measures, such as the hiring of air marshals or investment in new computer systems for cargo ships in order to obtain fast-track clearance (Crist, 2003).[55] After 9/11, air transport has been most affected by the tightening of security and longer delays. However, goods that are typically transported by air tend to be high-value products, such as electronic equipment and apparel, for which transaction costs generally represent only a small fraction of value (Walkenhorst and Dihel, 2002).[56] However, for perishable products, such as vegetables or fish, trade may have shifted to destinations that can be served by truck or train. But also in maritime transport, the prime mode of transport for bulk commodities, a range of precautionary measures were introduced as a consequence of 9/11.[57] For example, in the United States, 96-hour advance arrival notices were made mandatory and more frequent onboard Coast Guard inspections of crews and cargo have been taking place. Most of the additional security costs are charged to shipping companies (Crist, 2003).

Clark et al. (2004) find that port efficiency, which is affected by increased security measures, has an important impact on maritime transport costs compared to a multitude of other factors, such as competition,

53 A comparative table of terrorism insurance schemes across OECD countries is contained in OECD (2005) chapter II.5.

54 Blalock et al. (2005) find that baggage screening measures taken after 9/11 reduced passenger volume by about 5 per cent on average on all flights. However, strict border controls may not necessarily lead to higher transaction costs, for instance in terms of waiting times, and consequent reductions in transport demand. At the border between the United States and Canada, for example, more security personnel were hired following 9/11 and the flow of trucks was gradually brought back close to normal (Lenain et al., 2002).

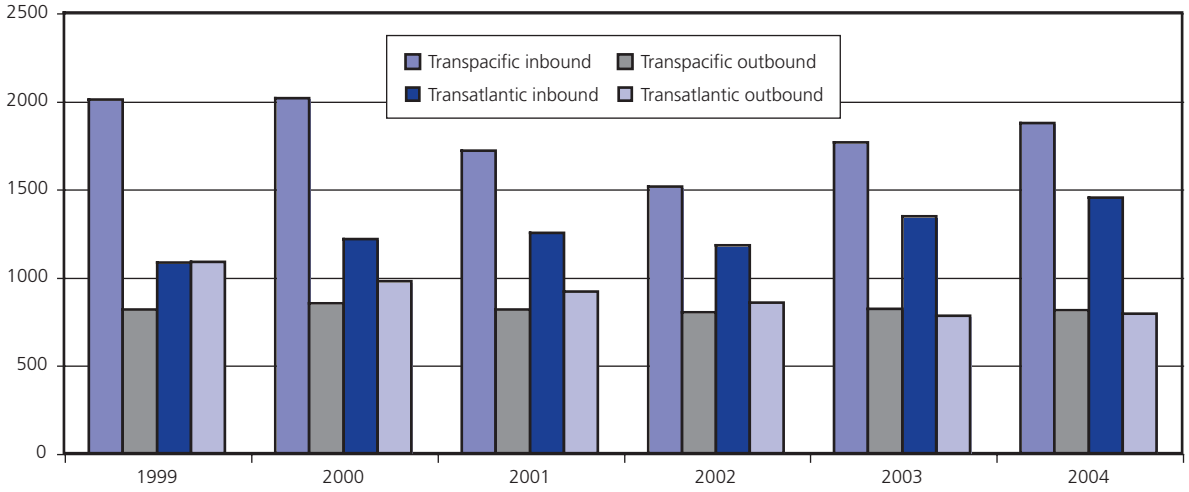
55 In December 2002, the United States launched the Container Security Initiative (CSI) which is aimed at identifying high risk containers already at the port of departure. Ports that do not have certain measures in place may be unable to export goods to the United States (Crist, 2003). A range of other border security measures have been developed, such as the Secure Trade in the APEC Region (STAR) initiative, the International Ship and Port Facility Security (ISPS) Code by the International Maritime Organization or the EU's "known shipper" programme.

56 For the United States it was estimated that, on average, transport and insurance costs amounted to 3.4 per cent of customs value in 2000. Yet, cost shares ranged from about 1 per cent for pharmaceuticals to more than 23 per cent for crude fertilisers (Lenain et al., 2002).

57 According to Lenain et al. (2002), container ships account for some 60 per cent of the volume of world trade. Crist (2003) quoting UNCTAD even speaks of 80 per cent.

technological developments and scale economies at both the vessel and seaport levels.[58] From Chart 15, it appears that inbound freight rates per unit of container volume for the United States have indeed increased after 2001 (the turnaround is particularly noteworthy for the transpacific route), while outbound rates have continued to decline.[59] Similarly, after 2001, freight costs relative to imports (i.e. c.i.f. relative to f.o.b. values) have risen again for the United States from 3.2 per cent to 3.8 per cent after several years of decline. While, after 2002, these increases may have been dominated by developments in the oil price (see Chart 16), the two curves do not move in parallel, suggesting that other factors, including the insurance component of transport costs, have also played a role. Ultimately, the c.i.f.-f.o.b. spread is a very crude measure, as the insurance component itself depends on the product composition and price changes of imports. However, even when looking at trade with larger partners, where product composition and prices are reasonably stable, as in the case of US machinery imports from Japan, the c.i.f. share of imports bottoms out in 2001 (at 2.3 per cent) and increases steadily thereafter to reach over 2.6 per cent in 2004. This trend is similar for machinery imports from Germany or, at a more disaggregated level, for imports of road vehicles from Japan. Conversely, the c.i.f. share of imports of machinery from Canada has consistently gone down (apart from a small rise in 2003). This may reflect the fact that machinery imports from Canada are carried by truck, where cost increases have been less significant, rather than by ship. After the 3/11 attacks in Madrid, the Secretary-General of the International Maritime Organization (IMO) used the opportunity to urge members to accelerate implementation of the International Ship and Port Facility Security (ISPS) Code, a set of measures to enhance maritime security while minimizing trade impacts.[60] The Madrid and London attacks themselves bore little relevance for the issue of transport security and trade facilitation since, bearing in mind the nature of the targets, both the Spanish and British governments mainly focused on enhancing security measures affecting domestic commuter transport rather than international trade transactions.

Chart 15
Containership freight rates by United States mainstream trades, 1999-2004
(Dollars/TEU)[a]



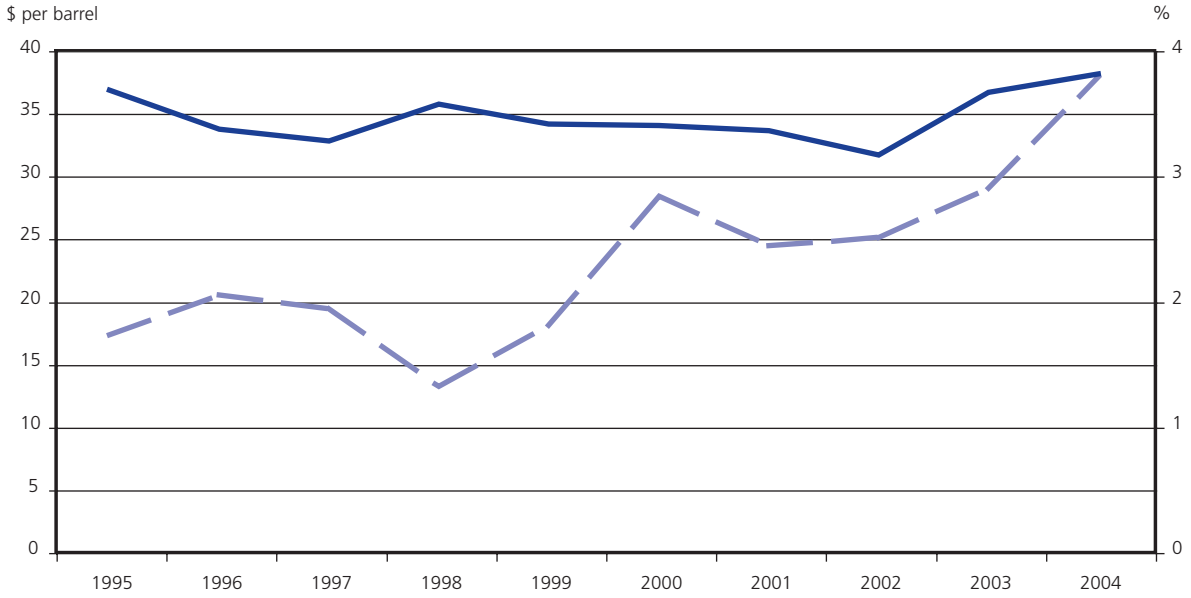
Note: [a] TEU refers to Twenty Feet Equivalent Unit, i.e. it is a nominal unit of measure equivalent to a 20' x 8' x 8' shipping container.
Source: US MARAD (2005).

58 In addition, charges are a function of product-specific characteristics, e.g. regarding certain handling requirements, and of the country of origin, which may only operate smaller vessels or require the hauling back of empty containers. Of course, total transport costs then also depend on the distance travelled with the oil price being the decisive cost component.

59 Of course, an important factor for lower outbound and higher inbound rates has also been the increase in the US trade deficit, which results in an oversupply of containers in US ports available for return shipping at cheaper rates.

60 See http://www.imo.org/Newsroom/mainframe.asp?topic_id=848&doc_id=3509, visited on 20 December 2005.

Chart 16
Oil prices and freight costs relative to imports in the United States, 1995-2004
(Dollars per barrel and percentage)



Source: IMF, International Financial Statistics.

(c) Conclusions

This review of how recent natural disasters and acts of terrorism have affected international trade flows suggests a number of conclusions, which seem to be consistent with current research work.

Natural disasters and acts of terror are similar in that they represent shocks to the economic system. But there are important differences too in the nature of these shocks and in their economic and trade effects.

Governments can only prepare for natural disasters and mitigate their effects; governments cannot prevent tsunamis or hurricanes from occurring. However, government action can reduce the likelihood of terrorist events as well as mitigate their effects. Unfortunately, government action to reduce the risk of terrorism through enhanced security measures may itself make international trade more difficult.

The effect of terrorism may be more pronounced for trade in services than for merchandise trade. Many forms of international services transactions (e.g. travel and tourism) require close contact between buyer and seller. Thus a heightened sense of terrorism risk may disproportionately affect services trade.

Since most large disasters are one-off events, their macroeconomic and trade effects tend to be localized and transitory. Communities at the centre of the disaster can adapt and the economic rebound even from a large disaster can be very rapid if social institutions, human capital and productivity are kept intact. The trade effects of individual acts of terrorism is likely to be small and transitory too. However, where terrorism persists, the economic effects are likely to be more permanent, perhaps even affecting the pattern of trade.

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II SUBSIDIES, TRADE AND THE WTO

A INTRODUCTION

Subsidies are one of many policy instruments subject to rules in the multilateral trading system, but they present more complex issues for policy-makers than many other instruments subject to GATT/WTO rules. One reason for this is that subsidies can be defined in different ways. Another is that that they are used in pursuit of a wide array of objectives. Even where they are not aimed at trade, they can affect trade flows. The kinds of subsidies of primary concern to this Report are those that impart an advantage to some domestic producers and thereby affect trade. The challenging task of determining which sorts of subsidies are problematic from the perspective of the trading system, and what might be done about them, has occupied an important place on the agenda of the WTO/GATT system.

This Report aims to provide an overview of the use of subsidies in different regions of the world and according to different economic activities. In order to analyse existing data on subsidies it is necessary to understand the different definitions used for subsidies and their economic effects. This is why the Report starts with a discussion of the definition of subsidies and an examination of the most important economic concepts related to subsidies. The analysis also considers the main reasons why governments appear to use subsidies and what the trade and economic implications may be of such policies. The Report will examine the WTO rules on subsidies, their evolution over time, their content from an economic perspective, and how WTO disputes have helped to shape national policies in this area.

Data on the use of subsidies are scarce in general and difficult to compare across countries and sectors because of methodological differences and data gaps. Nevertheless, the limited evidence available indicates that subsidies may have a significant impact on trade flows. According to some estimates global subsidies may amount to more than a trillion dollars per year, or 4 per cent of world GDP. Other estimates indicate that subsidies represent on average around 6 per cent of expenditure by governments and 1 per cent of their GDP. These values vary significantly across countries and sectors. The economic inefficiencies created by subsidies are potentially significant. Both developed and developing countries could benefit from reducing those subsidies that are not necessary to correct for market failures or to pursue valid policy objectives.

B DEFINING SUBSIDIES

At the origins of the GATT, little attention was given to the trade impact of subsidies. However, contracting parties soon appreciated the need to deal with subsidies in order to secure the value of their agreed tariff concessions. A country can undermine its market access commitments by providing subsidies to import-competing industries. In addition, subsidies given to competing exporters in third countries can divert trade away from a country that had relied on negotiated market access to another market. These concerns led to the development of more stringent disciplines on subsidies than those initially provided for under the GATT (1947). A major step was the negotiation of the plurilateral "Subsidies Code" during the Tokyo Round and, thereafter, of the WTO Agreement on Subsidies and Countervailing Measures (SCM) and the Agreement on Agriculture (AoA).[1]

In much of this Report the term "subsidies" refers to the concept of subsidies used in the WTO Agreement. Yet, the Report inevitably has to deal with other definitions of subsidies, in particular when it comes to the description of national or international data on subsidies or of national policies with respect to subsidies. This Report therefore starts with a discussion of the different concepts and definitions of subsidies used in the literature. Particular attention will be paid to those definitions relevant to the rest of the study, such as the definition of subsidies used in the System of National Accounts and the concept of producer subsidy equivalent (PSE) frequently used in OECD statistics. This Section ends with a short discussion of the WTO definition of subsidies under the SCM Agreement in the light of the concepts and alternative subsidy definitions introduced previously.

1. THE DEFINITION OF SUBSIDIES: CONCEPTUAL ISSUES

Although the term "subsidy" is widely used in economics, it is rarely defined. Often it is used as an antonym to a tax, i.e. a government transfer of money to an entity in the private sector. This seems, for instance, to be the case in the Oxford Online Dictionary[2] where a subsidy is defined as: "a sum of money granted from public funds to help an industry or business keep the price of a commodity or service low".[3] But many would argue that tax concessions are also a form of subsidization. Indeed, for the relevant recipients it may not make much difference whether they are made better off by receiving money or through the reduction of their tax bill. Both forms of "assistance" also represent financial transfers by the government. Border protection, e.g. tariffs, on the other hand does not result in any such financial transfer from the government, and instead results in fiscal revenue. Yet it could be argued that the imposition of a tariff represents a form of subsidization for the import-competing sectors that are thereby protected from foreign competition. To define subsidies in terms of government transfers or fiscal expenditure is thus not necessarily complete.

An alternative approach is to consider that a "subsidy" arises any time a government programme benefits private actors. The main difficulty with this approach is that recipients of, for instance, a cash transfer or a tax concession, are not necessarily the ultimate beneficiaries of the policy. For example, housing allowances, such as the German "Eigenheimzulage", consist in transfers or tax concessions to consumers who build a house. In their ultimate effect, however, they are not unlike direct payments to construction companies. Similarly, the main beneficiaries of subsidized intermediate goods may not be the recipients of the subsidies, but rather downstream firms utilizing these products as inputs in their own production. Such indirect effects may or may not be intended by the government. The more specifically designed a programme, the more likely it is that the intended beneficiary (objective) and the actual beneficiary (effect) coincide. But it is not necessarily

[1] The development of subsidy disciplines under the GATS has been left for the built-in negotiations that commenced in 2000 and currently forms part of the ongoing trade negotiations under the Doha Development Agenda.

[2] Panels and the Appellate Body commonly rely on the Oxford English Dictionary to define the ordinary meaning of words used in the Agreement. See, for instance, *Canada–Dairy*, Appellate Body Report: paras. 104, 107 and 108, for the definition by the Oxford English Dictionary of the word "payment" (appearing in AoA Article 9.1(c)) as "the remuneration of a person with money or its equivalent". The Appellate Body noted further that a "payment" which did not take the form of money was commonly referred to as a "payment in kind" and that the ordinary meaning of the word "payments" in Article 9.1(c) was consistent with the dictionary meaning of the word.

[3] This definition assumes that subsidies received are "passed through", i.e. have an effect on sales price. This assumption may not always hold, and pass-through may be a matter of degree, as it is conceivable that at least part of a subsidy is put to entirely different uses.

easy to design well targeted programs. The literature provides numerous examples of subsidy programmes that have unintended side effects. Adams (2000), for instance, examines the possibility that owing to improper targeting of inferior goods in the case of food subsidies to assist the poor, part may be leaked to high-income people, where they free up funds for other uses. Devarajan and Swaroop (1998) illustrate how official development assistance (ODA), even though targeted at a specific project, may indirectly finance other activities in cases where the government would have implemented the relevant project anyway and ODA has the effect of releasing government resources that can be spent elsewhere.

Another drawback of defining subsidies purely in terms of "benefits" is that such a definition should in principle take into account the other side of the ledger – the numerous government programmes that impose costs on those same "actors", either in the form of taxes or regulations that pose a burden on private activity.[4] Many governmental services, such as road infrastructure, are tax-financed by users, in this case through such levies as excise duties on cars and road tolls. The provision of road infrastructure should thus not be seen as a subsidy in its entirety, but it may contain an element of subsidization that is in most cases difficult to measure. Some subsidy programs even appear to be designed in order to counterbalance distortions created through other government interventions. In many countries, for instance, savings beneath a certain threshold are exempt from taxes. Such tax concessions serve in part to redress the discrimination of saving *vis-à-vis* consumption, which may explain why the German Government in its periodic subsidy reports excludes such tax exemptions from its subsidy calculation.[5]

The previous paragraphs illustrate some of the difficulties in defining the concept of subsidies. Although there appears to be agreement that subsidization involves the government and results in benefits for somebody, approaches differ when it comes to the details. Indeed, the relevant literature is full of references to the difficulties of defining the term "subsidy", as reflected in the frequently quoted statement by Hendrik S. Houthakker: "My own starting point was also an attempt to define subsidies. But in the course of doing so, I came to the conclusion that the concept of a subsidy is just too elusive".[6] What Houthakker wrote several decades ago still holds today. Rather than trying to pin down one specific definition of subsidies, this Section therefore discusses a range of characteristics of subsidy definitions used in the literature or in policy documents and analyses how different subsidy definitions make reference to these characteristics.

Depending on the context, a large number of government programmes may be considered subsidies. For simplicity, these programmes can be grouped into at least three categories: firstly, the government may transfer funds to producers or consumers, resulting in direct or potential budgetary expenditure, or use its power to instruct private entities to make a transfer. Direct transfers, like re-training grants or child allowances, would fall into this category. An example of potential expenditure is the provision of loan guarantees.[7] The latter may or may not lead to actual disbursements, but even if they do not, an official guarantee artificially lowers default risks of potential buyers and stimulates consumption that otherwise would not take place. If a government instructs a private bank to provide loans at preferential interest rates to certain private entities, this would not result in government expenditure. Yet this can be considered to be a government transfer as it would not have taken place without the intervention of the government and as it has the same effect as if the government itself had provided the loan at preferential rates.

Secondly, the government may provide goods or services at no cost or below market price, such as university education, public transport or food stamps. Such transfers also involve expenses for the government, with the difference being that beneficiaries receive in-kind contributions as opposed to funds they can freely dispose of.[8]

4 Sykes (2003).

5 Boss and Rosenschon (2002).

6 See quote in Steenblik (2003) p.4.

7 See, for instance, Freinkman et al. (2003).

8 Also the public provision of goods or services, e.g. electricity, can have intended or unintended indirect effects. It can, for instance, affect competition in industries that use the relevant goods or services as an input, as it affects producers differently depending on how intensively they use the input.

Thirdly, regulatory policies may be seen as subsidies, if they create transfers from one group to another. Border protection, for example, allows for price discrimination and pooling of revenues to producers that are implicitly financed by domestic consumers (Schluep and De Gorter, 2000).[9] In this context, Cadot et al. (2004) point out that regulatory instruments can circumvent forms of direct subsidization, leading to the same effects but at higher welfare costs. The authors demonstrate that preferential rules of origin amount to export subsidies for intermediate goods industries in the preference-providing country. This category of transfers caused but not paid for by the government may also comprise implicit subsidies arising from the failure by governments to internalize externalities, such as air pollution by industry, or rents associated with untaxed exploitation by private parties of publicly-owned or managed resources.[10]

2. THE DEFINITION OF SUBSIDIES IN NATIONAL AND INTERNATIONAL DATA SOURCES

Most definitions of subsidies in statistical sources or national legislation are rather explicit on whether they include or not each of the three subsidy categories distinguished above. But within these categories, an impressive range of different instruments are available to governments to grant subsidies. Many subsidy definitions would not embrace all of the possible instruments within one category because they define the term subsidy also along other lines. Indeed, subsidy definitions tend to make reference to one of the following characteristics of government interventions in order to confine the concept of subsidies: the recipients of subsidies, the form of subsidies, their objectives and their effect. Using the example of the banking sector, Box 1 gives a flavour of the variety of instruments that can be used within one particular sector.

Box 1: Possible subsidy instruments in the banking sector

Category 1:

Direct money transfers to certain banks:

In both, industrialized and developing countries, restructuring aid has frequently been given to banks during the process of privatization. More generally, governments intervene to rescue private banks that are in trouble, thus avoiding bank closure or the sale of assets to new investors. The "systemic risk" related to bank closure is most of the time given as an argument for public intervention. This type of intervention often takes the form of direct financial transfers to the establishment in trouble.

Institutional guarantees to certain banks:

Governments may provide guarantees to certain financial institutions, thus ensuring that the government steps in if the institution defaults on a loan. Such guarantees allow beneficiary banks to obtain better ratings from credit-rating agencies and as a result the banks can make considerable savings on the cost of refinancing. Institutional guarantees were, for instance, provided by the German Government for certain local and regional banks that were expected to serve small and medium enterprises (SME), a market segment that may be underserved by financial markets without government intervention.

9 Border protection has budgetary impacts and some may therefore consider it to be a form of subsidization that falls into the first category. In contrast to the other forms of subsidies within category one, however, subsidization through border protection results in an increase in government revenue and not in a decrease in revenue or an additional outlay.

10 See Steenblik (2003) for a discussion of this issue.

Loan guarantees:

State guarantees to banks for loans to companies are frequently used as a form of public intervention to support companies in difficulty. The advantage of state guarantees over direct subsidies is that they avoid immediate commitments from the public budget. In the case of state guarantees for bank loans to companies, the state becomes a lender of last resort and is obliged to pay the guarantee if the borrower is not able to pay a debt. While it is generally accepted that such state guarantees may contain an element of assistance to the borrower, there is no agreement as to whether thy also involve assistance to the lending bank itself.

Equity injections to avoid bankruptcy:

Governments are often minority or majority shareholders in banks and governments have frequently assisted such banks through equity injections in times of financial difficulties. It has been argued that such assistance results in subsidization if it is provided under terms and conditions that a private investor would not find acceptable acting under normal market conditions.[1]

Category 2:

State-owned banks:

In the past, banking services were often provided by state-owned banks and this is still the case in numerous countries, particularly in the developing world. Public ownership of banks has, for instance, been justified on the grounds of the "systemic risk" that bank activities can involve. The presence of information asymmetries in financial markets, with respect to the credit worthiness of potential clients, has also been used as an argument in favour of public supply of financial services.

Category 3:

Specific prudential regulation for certain establishments: the example of microfinance institutions (MFI):

Micro-credit schemes have proliferated in many developing countries as a surrogate to standard financial services and in response to the low penetration of traditional bank accounts. One of the major functions of MFIs is to provide borrowing opportunities to poor households and small firms which would otherwise not have access to credit. These borrowers can then invest the new resources for productive use and increase their revenues in the short to medium term. Microfinance institutions often act in a different regulatory environment than other financial institutions. If they face any prudential regulation at all, it is often less restrictive and thus less costly, thereby counterbalancing the fact that MFIs are only active in a small and not very profitable market segment.

[1] See, for instance, the definition of the "market economy investor test" as used by the European Commission and described in Bourgeois (2001).

Subsidy definitions often distinguish between two categories of recipients: producers and consumers. They also sometimes make explicit reference to the nationality of individuals, i.e. by making a distinction between domestic and foreign recipients.[11] Any given subsidy programme may in addition limit subsidization to certain subgroups within these categories. The more narrowly defined the group of (potential) recipients, the more "specific" a subsidy programme is considered to be. Subsidy programs with a wide range of (potential) recipients, instead, are often referred to as "general" subsidies.

[11] Odedokun (2003), for instance, points out that official development assistance (ODA) amounts to subsidization of specific activities in foreign markets leading to distortions, such as the increased consumption or use of certain commodities.

There is a tendency to assume that more "specific" programs are more distortionary, but whether this is the case or not may depend on the programme's objective. Boss and Rosenschon (2002), for instance, argue that in the case of redistributive activities the more narrowly defined the beneficiary group, such as handicapped people, the less transfers, say free public transport, should be seen as subsidies. If on the other hand, resources are redistributed within the public at large, for instance, in order to financially support theatres or hospitals, subsidization should be deemed to exist. Yet, this criterion may be hard to operationalize: targeted support to farmers or coal-miners may principally be socially motivated, but have large distortionary effects on resource allocation in the economy at large. It is more common, therefore, to consider the subsidy content of policies lower the wider the range of beneficiaries, as is explicitly the case in the German Government's Annual Subsidy Report (BMF, 2003) and is, arguably, the case in the WTO definition of subsidies that will be discussed in more detail below.

In particular, within the first category of subsidies defined above, a significant range of different forms of subsidization can be found. The most direct form of subsidization is cash subsidies referring to money transfers from the government to the recipient. Alternatively, governments can provide subsidies through tax concessions. Indeed, when a government provides a tax exemption, credit, deferral or other forms of preferential tax treatment to an individual or group, its budget is affected in much the same way as if it had spent some of its own money. A third form of subsidization consists in the assumption of contingent liabilities. These occur, for instance, when governments give institutional guarantees or loan guarantees with respect to the loans taken by certain institutions in the market place. Both practices reduce the financial cost of carrying out a certain business and thus constitute subsidies. In the case of a loan guarantee, for instance, the borrower need not pay a risk premium commensurate with its actual default risk, but instead obtains the loan at the risk-free interest rate.[12] This results in a subsidy for the borrower, even if the government agency is never requested to step in and repay the loan. Governments can also provide subsidies through procurement policies at administered prices such that a mark-up over free-market prices is afforded to certain producers. Last but not least, subsidies can be provided through equity injections into businesses if this results in maintaining the price of the relevant equities artificially high.

The most widespread, standardized information on "subsidies" is provided in National Accounts Statistics for which country data are available worldwide. National Accounts Statistics (NACC) define subsidies as follows: "Subsidies are current unrequited payments that government units make to enterprises on the basis of the level of their production activities or the quantities or values of the services which they produce, sell or import. They are receivable by resident producers or importers...".[13] This subsidy definition is restricted to the first category of subsidies defined above and only to one specific form of intervention within this category. It only includes direct payments in its definition and thus ignores transfers through tax breaks or soft loans.[14] The definition is also very explicit about the recipients of subsidies. Transfers are only considered to be subsidies if they are given to producers, while transfers made directly to households are considered as social benefits. In addition, recipients of transfers need to be resident in the country whose government is making the transfer, in order for the transfer to be considered a subsidy. Last but not least, it only refers to payments linked to the level of commercial activity and not to "decoupled" payments, such as pure income support. The definition only makes indirect reference to the effect of a subsidy, as subsidies are considered to be "unrequited" payments, i.e. no equivalent contribution is received in return.

In numerous subsidy definitions transfers pursuing certain policy objectives are implicitly or explicitly excluded. It has, for instance, been argued in the subsidy literature that payments for public goods[15] may not be considered subsidies and most definitions limit the use of the term "subsidy" to transfers to firms, including producer

12 See also Box 1.

13 United Nations, 1993 System of National Accounts, chapter VII, D.3: para. 7.72. See http://unstats.un.org/unsd/sna1993/tocLev8.asp?L1=7&L2=4, visited on 20 January 2006.

14 The NACC subsidy definition, for instance, does not include grants governments provide to finance the capital formation of enterprises, or to compensate them for the damage or loss of their investment. While the public supply of goods or services is not included either in the NACC subsidy definition, transfer payments made by governments to cover losses of state owned enterprises are considered to be subsidies according to the definition.

15 Public goods display the characteristics of non-rival consumption and non-exclusivity. A classic example of a public good is knowledge, when one person's acquisition of knowledge does not influence the ability of another person to acquire the same knowledge (e.g. to read a book), and where nobody can be denied access to the good (i.e. anybody can read the book).

households, not-for-profit organisations, state-owned enterprises, such as hospitals, and the government as a provider of goods and services that could be supplied commercially (Boss and Rosenschon, 2002). According to the bi-annual subsidy report of the German Government (BMF, 2003), defence expenditures (in pursuit of national interest) are, for instance, not considered to be subsidies. Conversely, if private provision of a good or service is possible, government funding may be presumed to result in subsidization. In practice, it is however not necessarily easy to make this distinction. For example, fundamental research carried out within companies may be commercially profitable and, in addition, produce positive external effects for society at large. Government support to R&D can be justified on the ground of the existence of such positive externalities. Yet, it is difficult to identify the exact compensation that allows companies to internalize positive spillovers. Any assistance beyond that amount results in subsidization of R&D activities that would in any case be profitable.

The effects of a transfer are relevant for a number of subsidy definitions that play a role in this Report, including the definition of subsidies that is known as the "producer subsidy equivalent" (PSE). The PSE is used by the OECD among others to quantify support to agricultural producers (OECD, 2005a).[16] This measure is based on the difference between domestic producer prices and world market prices and thus includes the effects of border protection. The effect of transfers is also relevant in the EU definition of "state aid", where "subsidies" are limited to (actual and potential) financial transfers to firms (i) if an economic advantage is obtained that a company would not have received in the normal course of business and (ii) if it affects the balance between certain firms and their competitors. The EU prohibits such "state aid", as it implies that certain economic sectors, regions or activities are treated more favourably than others (European Commission, 2002a). Hence, conferral of a benefit with selective access differentiates "state aid" by EU countries from financial transfers under market conditions, as well as horizontal measures open to all companies such as public education programmes.[17] Not surprisingly, the definitional criteria used in the WTO under the Agreement on Subsidies and Countervailing Measures (SCM) are similar to such laws seeking to preserve a level playing field among companies in different jurisdictions (see below). Given the importance the SCM Agreement attaches to the effects of transfers, the degree to which benefits are "passed through" from (direct) recipients of transfers to others (indirect recipients) has played an important role in WTO disputes.[18]

In sum, in comparing subsidy statistics from various sources, the definitional differences need to be kept in mind. Definitions may be narrower or wider as regards recipients, form, objectives and effects of government support, such that the relative size of transfers covered by one definition compared to another is not easy to tell.[19] Subsidy definitions are context-specific, and the same country may adopt a variety of definitions for different purposes. For instance, in order to ensure international comparability, German National Accounts Statistics do not include preferential tax treatment and soft loans. But these items are included in the Annual Subsidy Report of the German Government, which is geared towards measuring government financial flows other than administration-related expenses. By the same token, the German Subsidy Report excludes support to research and development (unless provided to individual companies for research projects the commercial exploitation of which is imminent or likely in the foreseeable future), but such payments are captured in national accounts irrespective of the beneficiary. Finally, in regard to impact, the Subsidy Report of the German Government includes a range of budgetary outlays that need not be notified as state aid pursuant to Articles 87 and 88 of the EC Treaty, since they are not considered to affect competition in the internal market,

16 Based on Steenblik (2003): Timothy Josling (1973) was the first to apply the PSE. The concept was then extended and refined by agricultural economists in the Directorate for Food, Agriculture and Fisheries of the OECD (1987) and the Economic Research Services of the US Department of Agriculture. It has since been applied to measure subsidies to coal production (Steenblik and Wigley, 1990) and was eventually tried in the case of fisheries.

17 While the latter, in reality, may lower the cost of labour for some firms and not for others, they are primarily targeted at the creation of equal opportunities for workers. In fact, Filges et al. (2003) have shown that properly designed education policies, while leading to large transfers from advantaged to disadvantaged workers, result in relatively small losses to economic efficiency.

18 See Section F for a more detailed discussion of WTO rules and disputes related to subsidies.

19 For statistical definitions it also matters which administrative unit dispenses the subsidy, as some subsidy definitions include all administrative units at federal/central, state and local level, while others only refer to subsidies provided by the federal/central government. This aspect is further discussed in Section E.1.

such as social adjustment measures in the coal sector.[20] The various definitions used in national and issue-specific contexts and their statistical implications will be further touched upon in Section E on the incidence of subsidies.

Last but not least, it may be worthwhile noting that economic analysis is not usually very concerned with the different type of subsidy instruments and the way they work in practice. Rather, it tries to identify so-called market failures and ask the question whether a government intervention can be justified from a welfare point of view. If the market failure can be corrected through a change in price signals given to certain actors, subsidies can represent a valid policy option. Usually it is then assumed that the correct amount is given to the appropriate recipient, and little attention is given to the various forms that a subsidy may take in practice, although this aspect is not unrelated to its ultimate impact. Subsidies are, for instance, often modelled as a transfer reducing the recipient firm's marginal cost of production with the aim of achieving a predefined allocative impact.[21] In practice, it is rather difficult to design government programmes having such a precise impact, and pragmatic criteria, like the ones discussed above, have to be used to restrict the scope of what measures constitute a "subsidy" in any given context.

3. THE DEFINITION OF SUBSIDIES IN THE WTO

Neither the GATT nor the Tokyo Round Subsidies Code contained a definition of the term "subsidy". This changed when the WTO SCM Agreement came into being. SCM Article 1 is entitled "Definition of a Subsidy" and spells out the conditions under which a subsidy is deemed to exist. First of all, there must be a "financial contribution by a government or any public body" (SCM Article 1.1(a)(1).[22] The different forms of financial transfers that were mentioned above are listed explicitly, namely (i) direct transfers of funds, including potential transfers, such as loan guarantees, (ii) foregone revenues that are otherwise due and (iii) goods and services provided by the government other than general infrastructure. Under the last point, government purchases are also mentioned. Article 1.1.(a)(1)(iv) specifies that subsidies are also deemed to exist if a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated under (i) to (iii). In addition to financial contributions by a government within the meaning of Article 1.1(a)(1), SCM Article 1.1(a)(2) mentions any form of income or price support in the sense of Article XVI of GATT 1994, i.e. support which operates directly or indirectly to increase exports of any product from, or reduce imports into, a Member's territory. SCM Article 1.1(b) stipulates that any such financial contribution or income or price support pursuant to Article 1.1(a) must confer a benefit to the recipient if it is to be considered a subsidy in the sense of the Agreement.[23]

Thus, in terms of the terminology used above, the SCM Agreement appears to exclude from its subsidy definition transfers falling into the third category (i.e. regulatory policies), but seems to take a rather inclusive approach with respect to the forms transfers can take within the other two categories.[24] The Panel in *US–Export Restraints*, for instance, concluded that export restraints did not constitute a subsidy, as they did not

20 See BMF (2003), in particular Annex 1 and Annex 8, Section 4, for a comparison of the subsidy definition used by the German Government in this with the definitions embraced for the purposes of national accounts, EC State Aid and a review undertaken by the Kiel Institute of International Economics.

21 See, for instance, Collie (2000) in his article on prohibited state aid in the European Union.

22 SCM Article 1.1(a)(1)(iv) also provides for the fact that a private body may make the financial contributions on behalf of the government.

23 Therefore, government programmes that constitute financial contributions but do not improve on the market conditions available to the recipient are excluded from the applicability of the Agreement. In *Canada–Aircraft*, the Appellate Body confirmed that a financial contribution had to make the recipient "better off" and that the appropriate basis for comparison was the marketplace in order to identify its trade-distorting potential (Appellate Body Report: para. 157).

24 Certain aspects from the list of financial contributions contained in SCM Article 1.1(a)(1)(i)-(iv) were disputed on several occasions. For instance, a normative benchmark was found to be necessary in order to determine what constituted foregone tax revenue that is "otherwise due". Here, the Appellate Body held that the fiscal treatment of legitimately comparable income needed to be contrasted with the treatment of income subject to the contested measure. Importantly, it cautioned that for the purposes of this comparison, it might not always be possible to identify a general tax rule that would apply to the revenues in question in the absence of the contested measure (*US-FSC*, Appellate Body Report: paras. 89-91).

represent a financial contribution by the government. Moreover, export restraints could not be considered to represent a financial contribution in the sense of Article 1.1.(a)(1)(iv) of the SCM Agreement.[25] The Panel Report stressed that government entrustment or direction was "different from the situation in which the government intervenes in the market in some way, which may or may not have a particular result simply based on the given factual circumstances and the exercise of free choice by the actors in that market".[26] Using a hypothetical example, the panel illustrated that a "tariff" could not constitute a financial contribution, even if it conferred a benefit to specific downstream producers. It added that if the concept of financial contribution were about the effects, rather than the nature of a government action, this concept would effectively be eliminated, leaving "benefit" and "specificity" as the sole determinants of the scope of the Agreement.[27]

The SCM Agreement makes limitations as to the range of (direct or indirect) recipients of subsidies when it comes to determining whether subsidies as defined in SCM Article 1.1 are subject to the further provisions in the SCM Agreement. Indeed, even if the existence of a subsidy has been established according to the definitional criteria in Article 1.1, Article 1.2 restricts the application of further disciplines to those subsidies that are "specific" to individual or groups of "enterprises or industries", as specified in SCM Article 2.[28]

This and other provisions in the Agreement referring to producers of subsidized products imply that transfers to consumers may not be covered. Also, the references to "enterprises located ... within the jurisdiction of the granting authority" contained in SCM Article 2.2 and to a Member's own "territory" in GATT 1994 Article XVI appear to preclude the applicability of these disciplines to ODA benefiting firms in other countries. SCM Article 2 provides a number of principles to guide the determination of "specificity". Most notably, a subsidy is to be considered "specific" if access to it is explicitly limited to certain enterprises. Conversely, if eligibility of enterprises is based on objective criteria and conditions, such as size,[29] and if it is automatic, specificity does not exist. SCM Article 2 acknowledges that, according to these principles, a subsidy programme may appear non-specific, but turn out to be specific in the way it is implemented. SCM Article 2.1(c) illustrates some of the factors to be examined in that regard, such as the use of a subsidy programme by a limited number of certain enterprises or the manner in which discretion has been exercised by the granting authority in making the awards.

The intricacies of this definition became apparent in a number of WTO disputes. Interpretations of different aspects by panels and the Appellate Body will be further discussed in Section F.

25 *US–Export Restraints*, Panel Report: para. 8.69.

26 *US–Export Restraints*, Panel Report: para. 8.31.

27 *US–Export Restraints*, Panel Report: paras. 8.37-8.38.

28 SCM Article 2.3 states that all prohibited subsidies under SCM Article 3 – i.e. subsidies contingent on export performance or on the use of domestic over imported goods - are deemed to be specific.

29 However, SCM Article 2.2 makes it clear that a subsidy that is limited to certain enterprises located within a designated geographical region is to be seen as specific.

C THE ECONOMICS OF SUBSIDIES

1. INTRODUCTION

The purpose of this Section is to assist the reader to better understand the twin questions of why governments use subsidies and how subsidies impact international trade. As is frequently the case in economic analysis, the starting point for what follows is a "benchmark" economy featuring perfectly competitive markets.[30] This approach provides the basis for general insights into the impact of policy interventions such as subsidies. As discussed further below, under the condition of a perfectly competitive market, no case can be made for a subsidy. Introducing a subsidy or some other government measure within a perfect market framework will be inefficient and welfare-diminishing. But if the perfect market assumption is relaxed, situations may arise where a government measure like a subsidy improves welfare. An efficient subsidy would correct a market failure, bringing social and private costs and benefits into alignment.

Neither in this Section nor elsewhere in this Report have we undertaken a systematic analysis of how subsidies compare with other policy interventions that might be used to achieve similar objectives. References to this question are, however, made in several places in the Report, notably in Section D dealing with objectives. It may nevertheless be useful to mention here that the choice of policy instrument to attain a particular objective can be important from an efficiency standpoint. This can be illustrated by a simple example.

Suppose that a government decided to protect a particular domestic industry on the grounds that there were learning-by-doing effects associated with the activity from which the wider economy would benefit, and that these benefits were not properly reflected by the market. In this case, a government might choose between imposing a tariff on competing imports or directly subsidizing the industry concerned. A tariff would raise the domestic price of imports and allow the protected industry's output price to rise to the same level. Domestic consumers would then have to pay the higher price. But if a subsidy were used, the domestic price would still be the duty-free import price, and the subsidy received by the domestic industry would allow it to compete with imports at world prices. Consumers would not be taxed, and the subsidy option would be regarded as the more efficient one. This is an application of the theory of optimal intervention (Johnson, 1965; Bhagwati 1971).

One issue that is not dealt with in the above example is the costs associated with financing and distributing a subsidy. It is assumed that this can be done costlessly, which will not be the case. Economic costs will still be incurred, even if taxes are levied in a non-distorting manner. Moreover, developing countries in particular may face difficult administrative hurdles in collecting revenue to be disbursed as subsidies. Similarly, identifying recipients of subsidies and implementing subsidy programmes are also not without their costs. Taken together, however, if the assumption of zero-cost subsidy collection and disbursement is removed, it will not affect the key arguments that are put forth in this Section.

A final point to be made here relevant both to this Section and other parts of this Report concerns a key distinction in terms of the incidence of two types of subsidies – export subsidies and production subsidies. Export subsidies are contingent upon exports only and will have different resource allocation and efficiency implications than production subsidies. Production subsidies apply to output regardless of its market destination, but they can also affect exports.

The rest of this Section is organized as follows. We shall first examine the welfare implications of subsidies in a world of perfect markets, a world in which subsidies can never be justified in terms of economic welfare. We shall then introduce a range of market imperfections or "failures" that correspond more to reality and see if this modifies the welfare analytics of subsidization. The market failures we consider are economies of scale and externalities. Finally, we shall examine a number of additional considerations that may influence subsidy

[30] Perfectly competitive markets exist with costless and free entry and exit by firms, homogenous products, constant returns to scale, the absence of any possibility for individual producers or consumers to affect prices, and the possession of full information on the part of consumers and producers. In practice, of course, these conditions rarely, if ever, exist.

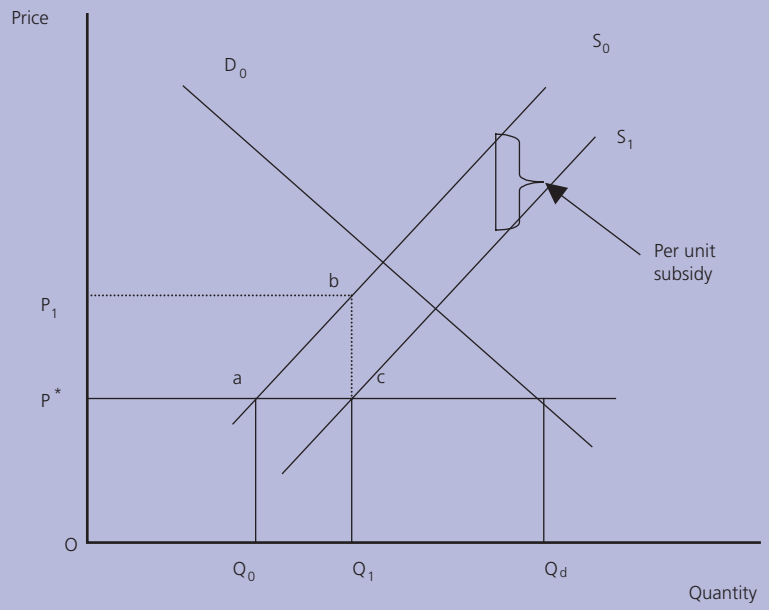
outcomes, in particular challenges facing policymakers in actually implementing sound subsidy policy, and the influence of political economy factors on subsidy decisions.

2. PERFECT MARKETS

If a market is assumed to be perfect and closed to international trade, production subsidies to firms have the effect of expanding output, reducing the price paid by consumers and creating an overall welfare loss, since resources will be allocated inefficiently. Introducing international trade into this scenario complicates matters. For example, an important distinction is whether the subsidy is granted to an import competing or export competing industry. If it is the former and assuming world prices are unaffected,[31] the end result will be an expansion in domestic output at the expense of imports (Box 2). A welfare loss arises from the application of the subsidy, since the subsidy creates a wedge between the optimal price (world price) and the actual price paid to domestic producers.

Box 2: Trade effects of production subsidies

In the diagram below domestic supply is given by S_0, domestic demand by D_0 and world price of the product is given by P^*. Since the world price is below the price that would clear the domestic market, the total quantity demanded of the product OQ_d would be satisfied by OQ_0 units of domestic production and Q_0Q_d of imports.



If the government, for political or redistributive reasons, decides that the level of domestic production should be OQ_1 instead of OQ_0, it has to then decide whether or not to use a tariff or a subsidy to expand production. If it uses a subsidy, and assuming it cannot affect world price, domestic supply will shift from S_0 to S_1 causing domestic production to expand to the desired level and imports to fall by Q_0Q_1.

Prior to the subsidy, domestic output was at point Q_0. Since additional domestic output beyond that level would cost less to source from the world market, the government will have achieved the desired level of output, but the resource implications for the economy will be negative. The additional cost to the economy is represented by the area abc.

[31] Since the country is assumed to be small, the domestic price is fixed by the world price and cannot change.

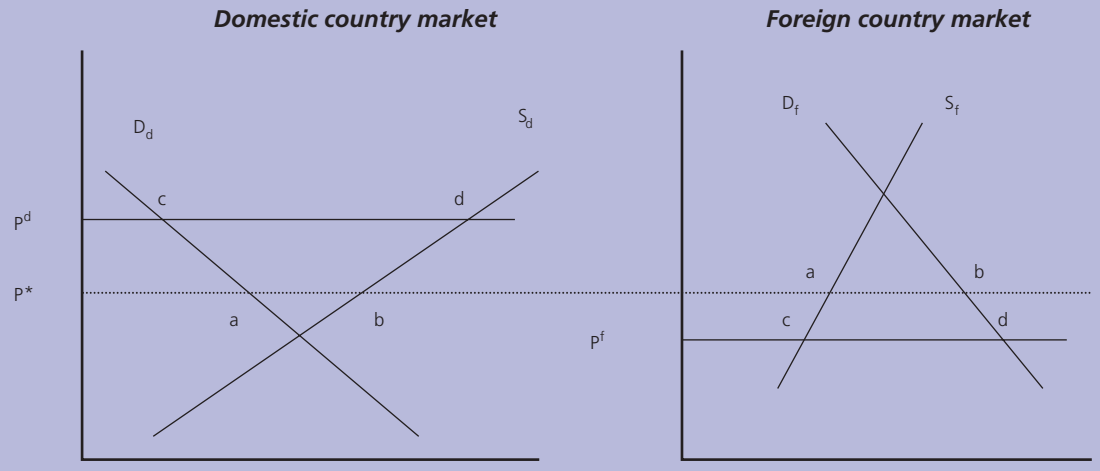
Now consider the case of an export subsidy to an industry. Both production and export subsidies may have the effect of expanding domestic output and exports. They differ, however, in their effects on domestic prices. Domestic prices are unaffected by producer subsidies but rise in the case of export subsidies if re-imports are prevented. Costs to the taxpayer in the export subsidy case will also be lower than in the production subsidy scenario since the volume of subsidised domestic consumption will be lower.[32]

With the small country assumption, therefore, the key international trade insight is that quantities adjust in response to the subsidy intervention. In the domestic production subsidy case, imports contract or exports expand, whereas in the export subsidy case exports expand. Inefficiencies arise in both cases since a portion of domestic output is determined by the subsidy-inclusive price, as opposed to the world price.

In the two cases considered above, the subsidizing country was assumed to be a price-taker in the world economy. This means that economic changes within the country will not have any impact on world prices. If this assumption is relaxed, output will still increase as in the small economy case described above. This time, however, the disequilibrium caused by the subsidies will also cause price effects in international markets. If more output is exported as a result of an export subsidy, then world prices will fall. Domestic prices, however, will rise, since some of the output will still have to be sold domestically and there is less quantity available in the market. This point is illustrated in Box 3.

Box 3: Export subsidy in a large country case

An export subsidy creates an incentive for producers to supply for export as opposed to domestic consumption. The withdrawal of supply from the domestic market causes domestic prices to rise. At the same time, since supply to the world market has increased, world prices fall. If the re-importation of goods into the domestic market from the world market is prevented, a wedge between the domestic price and the world price is created.



At the initial world price P* the level of exports from the domestic country in the above diagram is the distance ab. The world market clears because the foreign country (assumed to be the rest of the world) imports the same amount. If an export subsidy is provided to domestic producers, some of their output is diverted to the export market, increasing the price of the good at home (to P^d in the above diagram). The increase in supply on the world market, however, lowers the world price in the foreign market (to P^f in the above diagram). The new level of exports from the domestic government is the distance cd, which corresponds to the level of imports into the foreign country.

[32] This occurs because domestic prices rise with the export subsidy, causing quantity demanded to fall.

The overall impact of the export subsidy on the home country is decidedly negative. Domestic consumers pay a higher price for a product that they are blocked from sourcing at a lower price from the world market. This leads to welfare losses for consumers. Domestic producers are direct beneficiaries from the policy, since their production has expanded as a result of the subsidy.

Consumers in the foreign country benefit from lower world prices. Foreign producers, however, are net losers, since they now have to compete with the lower prices. Uncompetitive producers will be forced to exit the industry. Overall, however, the country is better off, since the increased benefit to consumers offset the loss to the producers.

A common element to both the production subsidy and export subsidy scenario when a subsidising country is large is a reduction in the world price. This will have negative and positive consequences for a subsidising country's trading partners. Producers of competing products will have to compete against the subsidised exporters at the lower price, whereas consumers of the cheaper imports will benefit. Countries that are net importers of the subsidised product, therefore, could gain overall from subsidies.

The analysis above deals with subsidies that are provided in relation to some economic activity or variable like production or export levels. Governments also frequently provide subsidies to finance wholly or partially the acquisition of fixed assets such as technology, plant, and equipment. Such subsidies may be paid only once or a limited number of times and are often referred to as non-recurring subsidies. Non-recurring subsidies can have effects on competition that go beyond the period in which the subsidy is actually provided. They tend to have the effect of increasing investment by some firms in the relevant market. As a consequence, more firms will be active in the industry or existing firms will produce at greater scale. This may have an impact on the conditions of competition in world markets. The duration of such effects on international competition depends, among other things, on the depreciation rate of the fixed asset and the evolution of demand in the years following the investment, as discussed in Grossman and Mavroidis (2003). Non-recurring subsidies play a role in the discussion below on government intervention in industries characterized by economies of scale.

3. MARKET FAILURES

In this Section the impact of subsidies is examined in market failure situations – that is, when a difference exists between the actual price and the socially optimal price. This difference can arise from a number of sources. Imperfect competition, where at least one firm can exercise control over price and output is one example. Another common example is an externality, where decisions of producers or consumers have impacts on others that are not fully reflected in market prices. In this case, if the externality is a positive one, the actual quantity produced would be less than the optimal amount. Conversely, if the externality is negative, production should be reduced, since it would be greater than the optimal level.

Two common examples of "market failures" that support the case for subsidy intervention are considered here. These are increasing returns to scale and externalities.[33] Information asymmetries in job markets, product markets and financial markets are additional examples of market failure, but are not analysed in this section.[34] Limiting the discussion to just two examples will not affect the general proposition that subsidies may be justifiable in some circumstances.

[33] Industries characterized by increasing returns to scale will typically also be characterized by imperfect competition, as discussed below.

[34] See Grossman (1990) for an overview of these arguments for intervention.

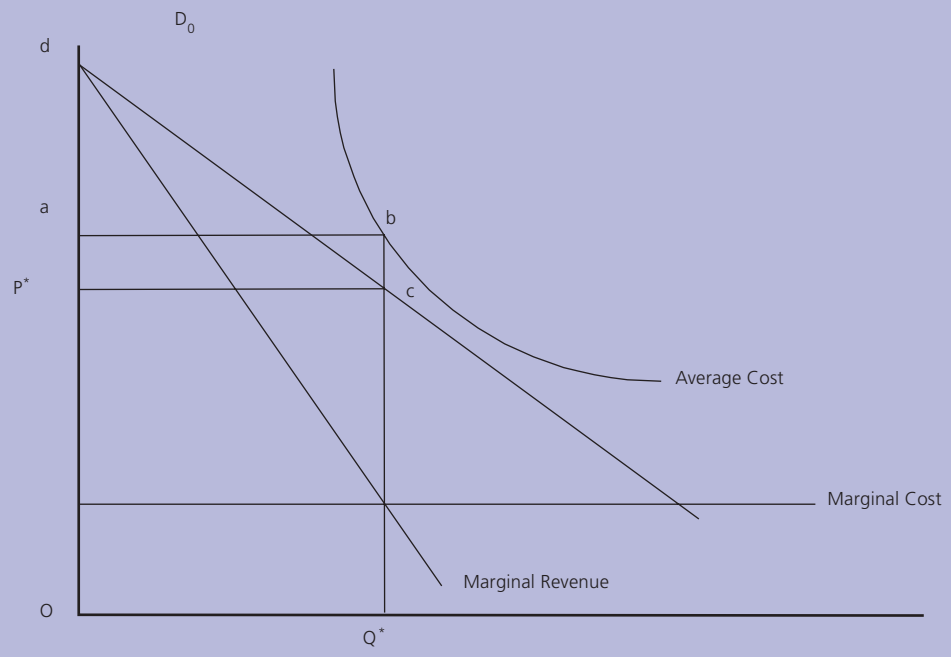
(a) Economies of scale

A salient characteristic of many modern industries is the large fixed cost of entry. Such costs may be due to significant investments in R&D or to the need for expensive and highly specialized capital equipment. Typical examples of such industries are the aircraft industry and the pharmaceutical industry. In such a set-up, average production costs decline the more units each company produces and the relevant industries are therefore referred to as decreasing cost industries or industries characterised by increasing returns to scale.

A simple example of economies of scale is where firms must incur a fixed cost in order to enter an industry, but then produce with a constant marginal cost (Box 4). The decision on whether to produce and how much to produce depends on demand. It may happen, as in Box 4, that demand is such that consumers are not willing to pay a price that is high enough for a producer to recover his initial investment. As a result, no investment and no production would take place in the absence of government intervention. Yet it may be that it would be desirable from the point of view of the society if production did take place. While producers only care about their own profits, what is good for the society depends on both producer profits and consumer welfare. Only a part of consumer well-being is reflected in what consumers actually pay for goods in the market. If a government has reasons to believe that consumer welfare which is not reflected in market prices exceeds the losses producers would suffer without a subsidy, the government may want to consider subsidizing the initial investment, thus encouraging producers to supply the relevant good. So far this is a static story that takes place in a closed economy. It becomes more interesting from the point of view of trade when these assumptions are changed. This will shall do below in relation to learning-by-doing and strategic trade policy.

Box 4: Returns to scale and subsidies

The figure below depicts a monopoly firm and is based on Grossman (1990). Without a subsidy, the firm is unable to produce profitably, since the price it would charge (P*) is below its average cost (point b). Total welfare would, by definition, be zero since no output is produced or consumed. Now suppose the government provides a subsidy to the firm of the amount P*abc. This induces the firm to produce a total amount of OQ*. Consumer welfare is the area dcP*, which in this diagram is greater than the cost of the subsidy.



(i) Learning-by-doing

Scale economies, as explained above, imply that average costs fall with increased output. Learning-by-doing internal to a firm implies that per unit production costs fall as output accumulates over time, i.e. the company learns each time it produces and average costs therefore fall over time. This particular type of economies to scale is also called "dynamic economies of scale". Evidence for the existence of such learning effects, for instance, exists for the construction of nuclear power plants and for the aircraft and semiconductor industry. Like the fixed costs associated with research and development and the capital expenditures mentioned before, learning by doing costs are irreversible.[35] The welfare analysis of production in an industry characterized by a steep learning curve is depicted in Box 3, which shows that there may be situations where a government wants to subsidize production during the early loss-making stages in order for consumers to enjoy the benefits later on.[36] Again, it depends on the relative size of consumer gains and company losses whether such an intervention would be desirable or not.

The losses made in the initial stages must be significant and the learning curve steep in order for there to be an argument in favour of government intervention. If the losses during the learning period are not too high, companies would normally be able to recover the initial investment over time. The need to learn-by-doing, however, implies that the company needs financing during the initial stages of production. It needs financing to acquire something, i.e. knowledge and experience, that will be entirely lost in case the company never manages to make profits. These types of investments are considered to be risky. While financial sectors in developed economies may be willing to provide loans for such risky investments, banks in developing countries that do not dispose of sophisticated risk management tools may be hesitant. This is why learning by doing internal to a firm has been related to the infant industry argument, i.e. the argument that nascent industries need government support in developing countries, as will be discussed in more detail in Section D. Another type of learning-by-doing also discussed in Section D is external to the firm, and this is taken up briefly below in the discussion on externalities.

(ii) Imperfect competition and strategic trade policy

In the above analysis of a domestic supplier in an industry characterized by increasing returns to scale, the possible existence of a foreign supplier was simply ignored. The question whether it could be beneficial to subsidize an industry characterized by economies of scale in the presence of foreign competitors was not examined. Not surprisingly, the answer to this question depends on the degree of competitiveness of the foreign supplier. It is theoretically possible to develop scenarios in which it would be better for an economy to subsidize a loss-making domestic producer rather than import the product, if the domestic producer is able to lower his marginal costs below those of foreign producers.[37]

Where two or more producers with large fixed costs are supplying the world market, other strategic considerations enter the picture. In such a set-up, competition will never be perfect and each producer has some market power. It may then be worthwhile for a government to subsidize such a producer even if it is not making losses. These arguments have been developed in the so-called strategic trade policy literature. Economic models developed in this literature were characterized by imperfect competition in the form of oligopoly or monopolistic competition. These models offered new insights into a possible role for trade policy. In specific terms, the intuitive inconsistency between proposing no intervention that was generated from perfectly competitive models and the existence of high fixed-cost monopolistic industries such as large civil aircraft, chemicals and autos was difficult for the policy community to accept. The new trade theory models were able to identify specific circumstances where intervention in the form of subsidies would be desirable. Intervention which alters the strategic relationship between firms can give one firm an advantage over another in imperfectly competitive markets, where each firm's commercial decisions (output and pricing) are dependent on those of its rival.

35 The economic literature refers to these costs as sunk costs.

36 Grossman (1990).

37 See, for instance, Vousden (1990).

This seductively simple idea was expressed in a model where two firms, from different countries compete in a third country market. The firms, therefore, produce only exports. As explained by Brander (1995), the government of the country where the firms are located cannot implement any policy to directly affect foreign rivals to the firms in their own country. As a result, the only natural option is to subsidize exports as long as it pays the government to do so, which as shown by Brander and Spencer (1985) turns out to be possible.

Subsidies in this model act as a profit-shifting instrument; profits earned by the competing foreign firm are transferred to the domestic firm, since the subsidy allows the domestic firm to commit to a higher level of output. The foreign firm cannot respond to the higher level of subsidized output, since an increase in its output will lower the price of the good (and its marginal revenue). The intuition behind the proposal for intervention is grounded in the positive profits earned by both firms and the ability of the government to use subsidies to shift some of the foreign firm's profits to the domestic firm. Since the profits earned by the domestic firm are higher than the subsidy, it pays for the government to implement the subsidy policy. Marrying subsidy intervention with profit-sharing, however, is not a foregone conclusion. Policy advice, as it turns out, depends upon the nature of competition and the structure of the market (Eaton and Grossman, 1986; Brander, 1995).[38] The predictions of these models tend to be sensitive to small changes in assumptions and the models typically do not take account of the possibility of counteractive behaviour on the part of the government that did not apply a subsidy.

(b) Externalities

A classic market failure is the existence of positive and negative externalities. As already noted, a positive externality exists if the benefits associated with producing and consuming an output are not fully taken into account by the producer or the consumer. In this case, the quantity consumed would be less than the socially optimal amount. On the other hand, if production or consumption is characterized by a negative externality, the equilibrium output level would be greater than that which would be socially optimal. Without government intervention a wedge would exist between the actual price in a market and the socially optimal price. Taking account of this wedge, however, is not a straightforward task and the role for subsidies, while potentially positive, is still limited. In general, a subsidy should be used to increase production or consumption of an under-produced good (Box 5).

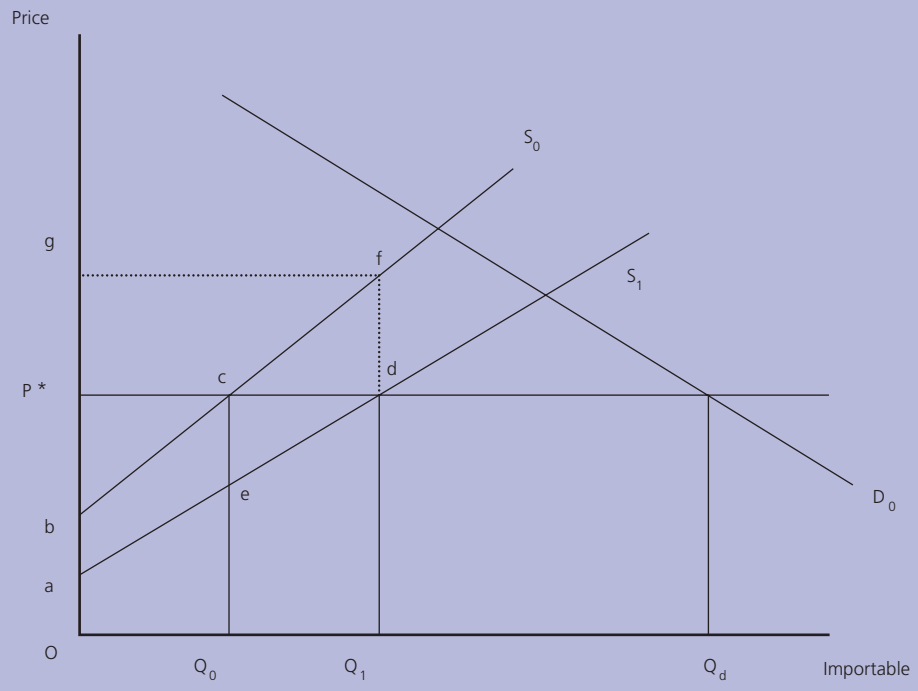
A number of arguments exist in favour of subsidy intervention in the presence of externalities. Among these are the cases involving environmental externalities and research and development (R&D) activities. For R&D the line of reasoning is that this kind of investment creates knowledge, which has public good properties – i.e. consumption of knowledge is non-rival in nature and non-excludable. But if the benefits of R&D investments spill over to others, while the costs are borne privately by those carrying out R&D, markets will not generate the socially optimal level of R&D. A government subsidy to encourage R&D that generates spillovers to other firms in the industry could help stimulate productivity and growth in a socially optimal way.

[38] In terms of the conduct of competition, if duopoly firms competing in the export market were to compete on the basis of prices, instead of quantities, the policy prescription turns out to be a negative subsidy, or a tax. The positive subsidy intervention argument also diminishes if the firms are assumed to compete in both the home and the foreign market. In this case, the effectiveness of any intervention will depend upon the ability to shift production between the various markets. If the markets are segmented and scope for differential pricing between the markets arises, then intervention maybe possible. If, however, the markets are integrated and differential pricing is not possible, intervention will not be possible (Horstmann and Markusen, 1986).

Box 5: Externalities and subsidies

In the diagram below, suppose the private domestic supply and demand curves are given, respectively, by S_0 and D_0. Consequently, with a world price of P*, equilibrium quantities produced and consumed are Q_0 and Q_d.

Now suppose that the production process is characterised by a positive externality that is not taken into account. As a result, the initial supply curve is not representative of the benefits of production. The social costs of producing each unit would be lower than what is portrayed by the supply curve S_0, which shows only the private cost. If the externalities are taken into account, the new supply curve would be S_1, which indicates a lower unit cost of production.



If the world price and the demand curve are assumed to reflect the true social costs, then the domestic production of the good at Q_0 would be less than the socially optimal level of production Q_1. The cost to society of this underproduction would be the area cde. To see this, assume a total subsidy of the amount dfgP* is provided, which expands output to Q_1. The total cost of the imports being replaced as a result of the subsidy is Q_0Q_1dc, but the total cost to society from producing the incremental output would be Q_0Q_1de. The difference is the area cde.

Therefore, if a positive externality in production exists, a production subsidy could be used to increase welfare. Again, a tariff would be inferior to a subsidy as an instrument of intervention, since it would distort consumption and increase the cost to society of producing the expanded output.

In principle, knowledge spillovers may arise not only when knowledge is created through R&D activities, but also when it derives from learning-by-doing. Learning-by-doing has been described above as a process that is internal to the firm. But it may happen that some of the experience a company gains, spills over to other companies, for instance, because employees of the first company change jobs and pass on their knowledge to their new employer. Empirical evidence of external benefits from learning-by-doing is scant, but has been found for the chemical processing industry and for the construction of nuclear power plants.[39] Aitken et al. (1997) have also found evidence for the existence of "learning-from-exporting" spillovers. The alleged existence of learning-by-doing spillovers lies behind one of the best-known variants of the so-called infant industry argument and will be discussed in more detail in Section D.

[39] Grossman (1990).

4. IMPLICATIONS FOR THE MULTILATERAL TRADING SYSTEM

A general proposition against the use of subsidies was presented in the context of a model that has little bearing on reality. This proposition was then overturned in a range of specific models and specific circumstances that better proximate reality – markets characterized by returns to scale, externalities and imperfect competition.

This ambiguity raises questions as to the desirability of a blanket ban on subsidies, since it prohibits the possibility of welfare-enhancing intervention. This view is shared by many, but not universally. The lack of universal acceptance of tolerating subsidies is grounded in three contexts –implementation issues, the political process, which grants the subsidies and the international consequences of domestic subsidies.

(a) Implementation of subsidy programs

Identifying the precise cases where intervention is socially desirable is not easy. The information requirements for appropriate interventions are extremely high, thereby making the possibility of mis-timed and mis-targeted intervention high. These implementation issues are called "government failures". So while market failures may warrant government intervention, government failures may exacerbate rather than alleviate the problem. Some of the more common examples of when subsidy intervention becomes problematic include rent-seeking on the part of beneficiaries and the political economy of the decision-making process involved in granting subsidies. In democratic societies, electoral pressures may influence the taxing and spending patterns of governments. Politicians, although professing to act in the public's interest, sometimes make decisions that are in their own self interest, for instance in order to increase the chances of re-election (Grossman and Helpman 2002, Hillman, 1989). This issue is taken up in more detail in the next Section.

Even if subsidy programmes correctly identify beneficiary industries and firms, achieving the predicted economic effect is not necessarily assured. All of the cases examined above assume that a subsidy will generate a supply response. Sometimes, however, firms may receive the subsidy, but may not necessarily use the subsidy commercially. Empirical studies confirm this hypothesis. At one extreme is the possibility that instead of using funds to finance output expansion, a firm could use the funds for a number of investment purposes that yield medium- to long-term benefits. At the other extreme lies full "pass-through" where the entire subsidy is used to develop a competitive advantage. The extent to which prices change in the subsidising industry will depend upon a number of market factors, such as the ability of a firm to affect prices.

(b) The political economy of subsidies

The political economy of subsidies deals with the central question of how the political process interacts with the heterogeneity of interests in society to allocate subsidies and determine the pace of their removal. More specifically, do the decisions of elective officials always lead to the socially optimal use of subsidies in the manner described earlier? The conclusions of a number of studies is that subsidization is correlated with the political influence of the beneficiaries (e.g. retirees and the elderly in the case of social security or middle and upper class groups in the case of educational subsidies).[40]

Much of the political economy discussion takes place against the background of a specific political environment, that of democracies, in which officials need to be elected by a majority of their constituency. The simplest political model is that of the median voter.[41] Voters are distinguished along one dimension, for example, by the economic impact of a subsidy programme. A voter can benefit from the programme if she becomes eligible to receive a subsidy. But a voter will also incur a cost because taxes need to be raised to pay for the subsidy. Clearly, those voters who are not eligible for the subsidy will only incur a cost and will not support the programme while beneficiaries of the programme will support it.

[40] These examples include export subsidies given to US wheat (Gardner, 1996), European subsidies to coal (Anderson, 1995); subsidies to education (Fernandez and Rogerson, 1994; Kemnitz, 1999); and social security spending (Mulligan and Sala-i-Martin, 2003).

[41] Also see Section D.3 on redistributive policies and the median voter.

Candidates for office win only if they get a majority of the vote. Alternatively, incumbents are able to maintain political support if they pursue policies that the majority of voters care about. Thus, whether the subsidy programme is implemented or not depends on the preferences of the median voter. If the median voter is a beneficiary of the subsidy programme, then this implies that the majority of voters are beneficiaries. In this case, politicians are able to marshal support by implementing the programme. On the other hand, if the median voter incurs a cost from the programme, this means that the majority of voters would lose out if the programme is implemented. The subsidy programme would therefore not be implemented.

Perhaps the only clear prediction that can be drawn from the median voter model is that highly targeted or specific subsidy programmes are unlikely to be implemented because only a few benefit. The median voter would be unlikely to favour such sector-specific subsidization, although she would not be averse to more general subsidy schemes, the benefits of which are more widely diffused. One can go beyond the standard median voter framework to consider more complex political environments, where voters can form coalitions (e.g. special interest groups). Special interest groups may arise because government policies can produce an uneven concentration of benefits and costs. For example, giving subsidies to an industry leads to large individual gains to the firms operating in that industry, while the costs of the subsidy programme, which are larger in aggregate (see discussion in subsection 2 above), tend to be spread over a very large number of taxpayers. These producer groups then have strong incentives to organize and use campaign contributions to try to influence the type of decisions taken by political incumbents. But because the costs of the subsidy programme to taxpayers are so diffused, there is no similar urgency on their part to organize to oppose the programme.

Grossman and Helpman (1994) develop a model in the international context where a politician's continuance in office is dependent not only on obtaining the support of the general electorate but in currying favour with special interest groups. Incumbents need financial contributions for a variety of reasons. They may need a large war chest to deter potential political rivals, or to pay for political advertising to sway uninformed voters or to retire campaign debt. Thus politicians are willing to offer trade and subsidy policies for sale. While they care about maximizing social welfare (since they need to appeal to the informed voter), they also care about the amount of financial contributions they can generate. Given the mixed incentives of politicians (a weighted average of social welfare and campaign contributions), the policies that are chosen in equilibrium will deviate from the socially optimal. Compared to free trade (the socially optimum), the prices of goods produced by lobby groups will be higher through the use of tariffs or export subsidies. In this context, the subsidies that are provided to a specific industry are not intended to correct a market failure, but to improve the economic standing of the special interest group, who in turn will reward the incumbent. While this result explains why subsidies are offered when it is not economically justifiable, it also helps explain the resistance to their removal in the domestic and international context.

(c) International consequences of domestic subsidies

Section F will take up the issue of the design and structure of multilateral rules on trade-related subsidies. However, an important point should be made here in relation to these rules. The welfare propositions spelled out in this Section have focused primarily on the impact of subsidies on the subsidizing economy. In some instances, such as export subsidies, the welfare effects on the non-subsidizing economy were also taken into account. Where the exports of a country are displaced by a foreign subsidy, producers will be negatively affected, but consumers may benefit depending upon the price effects. The only circumstance in which displacement does not occur is when the subsidizing economy is too small to affect world price. In sum, the world price effects of subsidies are crucial in the design of multilateral trade rules.

Another aspect of subsidies that has international consequences is the response by one country to the subsidy of another via various forms of remedial or offsetting action. Such action can be in the form of subsidies, countervailing duties, or a legal dispute. For example, a country that uses import substitution subsidies to offset import competition could face counteraction by an exporting country in the form of export subsidies, which would lower the price of the exporting country. Countervailing duties imposed by an importing country will tend to offset the initial subsidy in the exporting country. A legal challenge would question the legitimacy of a subsidy policy rather than resorting to an offsetting intervention. Section F considers these issues in the context of the Agreement on Subsidies and Countervailing Measures.

D SOME STATED OBJECTIVES OF GOVERNMENTS FOR USING SUBSIDIES

This Section discusses the main objectives governments claim to pursue with subsidies including industrial development, innovation and support for national champions, environment related objectives and redistribution. Under the broad category "redistribution", three more specific objectives are examined: the use of subsidies for regional policy purposes, adjustment support for declining industries and universal service obligations. This selection does not pretend to be exhaustive but it covers some of the most important objectives pursued by governments in developing and developed countries.

For each objective, the economic rationale for government intervention is discussed. The focus is on efficiency arguments, that is on whether an intervention may increase "the size of the pie", which does not mean that efficiency is the only criterion. Even if there is no efficiency argument, interventions might be justified for other reasons, such as to transfer income to certain disadvantaged groups within society or to augment national prestige. Economists have little to say about the weighting of other objectives relative to that of increasing efficiency. In each subsection, the effectiveness of subsidies with respect to the claimed objective is examined. Each subsection discusses the appropriateness of using accompanying and/or alternative measures. Reference is also made to the sectors in which subsidies are used to pursue particular objectives and some specific examples, e.g. of successful projects or failures are presented.

The first subsection discusses the use of subsidies for industrial development purposes from a developing country perspective. It considers how ideas and experiences have shaped approaches towards the role of government interventions and subsidies in particular in industrial development policies. The main efficiency-based arguments in favour of industry promotion, which are essentially variants of the "infant industry" promotion argument, are then analysed in some detail together with the role of subsidies in such policies. Given their importance in the debate on industrial promotion, implementation issues are addressed separately. A brief summary of the literature on the lessons from the Asian experience closes the discussion.

The second subsection examines the use of subsidies to support innovation and for strategic purposes. Innovations are an important driver of economic growth and support to innovation is a core component of industrial policies in emerging and developed countries. The discussion focuses on innovations at the global knowledge frontier, and not on the absorption of innovations that has to some extent been dealt with in the previous subsection. High R&D intensity is frequently associated with imperfect competition in the sectors concerned which might induce governments to use subsidies to shift rents or pursue other strategic policies. Subsidization of national champions is therefore also examined in this subsection.

The third subsection discusses the use of subsidies for redistribution purposes. A summary of the reasons why societies redistribute income is followed by an examination of the costs involved in transferring income from the rich to the poor. The effectiveness of different forms of subsidies is compared. The subsection then goes on to consider some specific examples of how governments use subsidies to achieve equity goals. While it is typically low-income groups who are the targets of redistribution programmes, subsidies to achieve more balance in regional development will also be discussed. Finally, the use of subsidies to assist declining industries to adjust to economic difficulties will also be considered in this subsection.

The fourth subsection compares instruments that can be used to support environmental conservation. The discussion focuses on the economic justification for the use of subsidies to conserve the environment, distinguishing between various causes of environmental degradation. A selective overview of the types of environmental subsidies that have been implemented by different countries is provided. Environmentally harmful subsidies – that is, subsidies that support activities that damage the environment – fall outside of the scope of this subsection, which addresses environmentally motivated subsidies.

The fifth and last subsection covers cases where subsidies to a certain sector are deemed justified on the basis of some specific characteristic of the sector, inherent to its very nature. Examples of this type of subsidies include subsidies to the energy or food sector justified by the specific role of these sectors in relation with national security, subsidies to agriculture justified on the basis of the so-called "multifunctional" character

of agriculture or of non-trade concerns, and subsidies to the audiovisual sector motivated by the perceived cultural value of the sector. As in previous subsections, the economic justification for the use of subsidies in these cases and the existence of possible policy alternatives are analysed.

1. INDUSTRIAL DEVELOPMENT

Policy-makers in developing countries often consider subsidies a useful tool to develop certain industries, with industries in this context referring to activities in the agriculture, manufacturing or services sectors. This objective has often been linked to the infant industry argument, i.e. the view that in the presence of more developed countries, less developed countries cannot develop new industries without state intervention. It has been argued that many of today's industrialized countries successfully applied infant industry promotion policies in early stages of their development. The role of government intervention in East Asia's industrial success has also received a lot of attention in the literature. Critics argue that the most impressive development records are related to a laissez-faire approach, keeping government intervention to the minimum. This subsection will survey the relevant literature and present examples illustrating both sides of the argument.

(a) Development strategies, industrial policy and subsidies

The approach to government-assisted industrial development and preferences for specific policy instruments have evolved over time as a result of changes in development thinking and the external environment. Ideas regarding the linkages between trade, development and the role of government have changed a good deal in the post-war period, influenced in part by country experiences.[42]

In the 1950s and early 1960s, development was equated with industrialization and import substitution was seen as the route to industrialization. The view that a more or less free market would not solve the development problem was widely accepted. Large-scale comprehensive planning was considered to be the appropriate policy instrument despite the fact that necessary data were largely missing and that neither planning nor growth were very well understood. The role of capital formation as the main source of growth was emphasized. As most capital goods had to be imported, overvalued exchange rates were seen as a means to encourage investment. But exchange rate overvaluation induced balance of payments pressures which were countered through a variety of trade restrictions. While protection was typically afforded mainly to consumer goods, in some large countries, domestic production of capital goods was encouraged by keeping out imports and by direct subsidies.[43]

The experience of the 1950s and early 1960s, sometimes referred to as the easy stage of import substitution, created considerable hope among economists and country leaders. Compared with the pre-war period, investment and growth rates increased as did the share of manufacturing in GDP. Life expectancy at birth and literacy rates rose and infrastructure developed. During the 1960s however, distortions became increasingly evident. Agriculture was penalized. Exports were penalized. Unemployment prevailed and, surprisingly, capital was underutilized. Two large collections of case studies published around 1970 carefully documented these distortions.[44] At the same time, estimates of total factor productivity growth became available showing very limited improvements, if any, in developing countries. It also became apparent that poverty was not declining at a significant pace.

By 1970, economists had started having doubts regarding import substitution as a development strategy. Doubts were not only fed by the facts. Developments of economic theory also contributed. While second-best theory had provided intellectual support to import substitution, the general theory of distortions, which refined it, reinforced the case for trade liberalization. Second-best theory suggested that trade liberalization could not be guaranteed to be advantageous in an otherwise distorted world. The general theory of distortions further developed the argument and showed that trade policy is usually neither first nor second best but rather *n*-th best. Another attack on the import substitution strategy came from Robert Baldwin's influential paper entitled

42 See Winters (2000), Bruton (1998).

43 See Bruton (1998).

44 See Balassa and associates (1971) and Little et al. (1970).

"The case against infant industry protection" published in 1969. In his paper, Baldwin showed convincingly that infant-industry duties do not only distort consumption, they may fail to correct the market failures they are intended to address and may even result in a decrease in social welfare. If, for instance, the acquisition of the socially optimal level of knowledge requires some direct outlays, imposing tariffs is no guarantee that these socially optimal outlays will be made. He also explained that what is required to handle the special problems of infant industries is a much more direct and selective policy measure than general import duties.

Doubts regarding the import substitution strategy were further fed by the exceptional export and growth performances of the Republic of Korea and Chinese Taipei in the 1960s. Chinese Taipei and the Republic of Korea had made substantial policy changes in the late 1950s and early 1960s that encouraged firms to export. In both cases, exchange rates were unified, currencies devalued and export incentives put in place. These policies were designed to ensure that producers were no longer rewarded primarily for selling in the domestic market – returns to exporting were made at least as attractive through the removal of the anti-export bias inherent in import substitution policies. Initially, these strategies were seen as export promotion with limited government intervention. However, this view was soon disputed. It is now largely acknowledged that governments intensively promoted specific sectors in the Republic of Korea and Chinese Taipei, as well as in Japan. Whether export promotion and trade policy interventions played a crucial role in the "East Asian Miracle" is an open question.[45] What is fairly clear, however, is that the circumstances leading to success in the Republic of Korea and Chinese Taipei were not typical. The policy instruments used were typically the same as those used elsewhere, including import quotas and licenses, export subsidies, public ownership and tax holidays. But the manner of implementing and monitoring trade policies were different. A political leadership fully committed to strong economic performance was firmly in place and government-business relationships were highly unusual. The extent to which government priorities and resources were organized around export performance in the Republic of Korea was striking.[46]

The lessons learned from the import substitution experience, and some learned from the export promotion experiences in the Republic of Korea and Chinese Taipei, contributed to the emergence in the 1980s of a new strategy relying on outward orientation with minimal government involvement.[47] The emphasis on exports as an engine of growth was drawn from the Asian experiences, while the strong scepticism *vis-à-vis* government interventions was largely inspired by the import substitution experiences. Anne Krueger's work on rent seeking and difficulties associated with the implementation of sophisticated policies supported the view that government failures were more likely than market failures and that an effective market mechanism would naturally emerge if policy-induced distortions were eliminated. Over the 1980s, the World Bank and the International Monetary Fund became strong advocates of an outward orientation strategy.

In the outward orientation strategy, the suspicion of targeted trade policy interventions was rooted in a general scepticism regarding the capability of governments to deliver appropriate policies. While most supporters of outward orientation would agree that some market failures provide a case for temporary intervention, they would stress difficulties with detecting and quantifying the externality, identifying the appropriate intervention and preventing the capture of policies, as reasons not to intervene. This scepticism was itself largely based on anecdotal evidence and stylized facts.

During the 1990s, the outward orientation strategy came increasingly under fire. Disappointing results in Latin America and Africa, unsatisfactory performance in the transitional economies and the financial crisis in Asia raised doubts regarding the capacity of outward orientation to promote development. Empirical work regarding the growth benefits of openness looked more promising initially, but this work has been challenged more recently on methodological grounds.[48] Interest in the linkages between trade reforms, inequality and poverty has also revived, and results have confirmed there can be no simple general conclusion about the relationship between trade liberalization and poverty.[49] The debate on the interpretation and the lessons to

45 See the detailed discussion in Noland and Pack (2003).

46 See Noland and Pack (2003), Bruton (1998) and Rodrik (1993).

47 The outward orientation development strategy is sometimes referred to as the New Orthodoxy or the "Washington Consensus".

48 See Hallak and Levinsohn (2004).

49 See Winters et al. (2004).

be drawn from the East Asian experience has intensified.[50] The presumption that governments typically lack the capacity to implement trade policies has also been questioned.[51]

With this background of growing doubts, new strategies have been slow to emerge. A number of trends however can be identified. First, multilateral, regional and bilateral trade agreements are imposing increasing disciplines on traditional trade-policy instruments. Tariffs are progressively being reduced, quotas are largely prohibited and subsidies are disciplined. Governments make an increasing use of new trade policy tools, in particular export promotion and FDI attraction.[52] Second, attention has progressively shifted from import policies to export policies. The World Bank's focus, for instance, has moved from the incentive framework associated with the tariff regime to removing policy and other obstacles that prevent producers from taking advantage of new market opportunities. This has been reflected in the Integrated Framework Diagnostic Trade Integration Studies. Third, the crucial importance of institutions and learning have been recognized. This has repercussions for the design of industrial development policies. Finally, economists are more nuanced and cautious with policy advice than they were before. Most importantly, the one-size-fits-all approach has been abandoned. A better understanding of the growth and poverty effects of specific trade and industrial policy interventions is warranted.[53]

Considerable divergence remains in views on the role of governments in industrial development strategies. Although the need in some instances for pro-active government interventions and industrial policies has been recognized, the World Bank continues to mistrust direct government selection of promising sectors and to favour the use of indirect mechanisms to promote technological upgrading, by means of attracting FDI and developing local technological capabilities.[54] At the same time, a new strand of literature is exploring novel approaches to industrial policy that take into account the traditional arguments against interventions. One approach emphasizes information externalities entailed in discovering the cost structure of an economy, and coordination externalities in the presence of scale economies, and sees industrial policy as a discovery process where firms and the government learn about underlying costs and opportunities and engage in strategic coordination.[55] Another approach emphasizes the role of recent shifts in the institutional mechanism of international trade such as the emergence of production and buyer-led networks and sees negotiations with multinational corporations as the main focus of industrial policy.[56]

(b) Arguments for industrial promotion

As explained in Section C above, for economists the case for government interventions rests on the existence of market failures. With perfect competition, small firms and well-functioning markets, prices give producers the appropriate signals for efficient resource allocation. Government support causes resources to be used in an industry beyond what is optimal. This is all the more so if part of the subsidized output is exported and contributes to a deterioration of the terms of trade. In the presence of market failures, the general theory of the second best applies. This theory argues that for every market distortion, there is an optimal policy intervention that addresses the distortion most directly and does not create additional distortions. If the optimal remedy is not available to the government for some reason, other measures can be taken which indirectly address the distortion. In general, industry-wide subsidies do not address distortions in a targeted way and would not be optimal. Thus, for each market imperfection, it is necessary to consider whether output or export subsidies would improve efficiency but also whether and which other measures might be available for achieving even greater efficiency.[57]

50 See Noland and Pack (2003).

51 See Rodrik (1995).

52 See Melo (2001).

53 See Hallak and Levinsohn (2004). Moreover, given the complex and ambiguous nature of the effects of certain interventions, careful impact assessments are recommended prior to the introduction of trade reforms. Such assessments may help design complementary and compensatory measures.

54 See de Ferranti et al. (2002).

55 See Hausmann and Rodrik (2003) and Rodrik (2004).

56 See Pack and Saggi (2006)

57 See Grossman (1990).

The main arguments that have been put forward to justify selective government interventions in developing countries involve information and coordination problems. Informational barriers to entry and learning spillovers among producers lie behind the most familiar variant of the classic infant industry argument. This is the case where productivity gains resulting from learning-by-doing accrue partly to firms other than the one that actually undertakes the manufacturing. More recently, spillovers associated with learning about the suitability of local conditions for production have drawn considerable attention in relation to diversification. Information problems faced by consumers have also provided arguments for interventions in support of infant industries. When consumers have imperfect information on foreign products, a firm's investment aimed at building reputation will benefit others.[58] Finally, information problems faced by lenders on capital markets have played a prominent role in the infant industry debate. Because of information asymmetries, equities markets do not finance much new investment. Credit mechanisms then become the primary vehicle for raising capital. But credit markets are often characterized by credit rationing.[59]

Coordination problems, which may justify an intervention, could arise in the presence of interdependent investments related to vertical linkages, large-scale economies and restrictions to trade. Entry by a new producer may be inhibited by the lack of a purchaser or of a low-cost producer for an important input.[60] More generally, markets play a central role in coordinating economic activities through the price system. But information is also conveyed to economic agents by various other institutions that are relatively well developed in the rich countries. Institutional arrangements for cooperation and information exchange are typically weaker in developing than in developed countries. Hence there may be a greater role for governments to create institutions and facilitate coordination.[61]

Other arguments for selective industrial policy interventions that have been considered but could be seen as less specific to development, relate to situations where research and development generate knowledge spillovers or where imperfect competition allows governments to pursue strategic trade policies. These cases are examined in subsection 2 below.

The first infant industry proponents at the end of the eighteenth century stressed that production costs for newly established industries within a country are likely to be initially higher than for well-established foreign producers of the same product, who have greater experience and higher skill levels. That alone, however, would not justify a government intervention for efficiency purposes. If costs are expected to fall sufficiently during the learning period to generate a discounted surplus of revenue over costs after a reasonable period of time, firms should be able to raise the funds they need to cover the losses incurred during the learning period in the capital market. If this is impossible, it is likely to be because of some failure of the capital market, a case that is considered below.

The infant industry argument must rest on the existence of knowledge spillovers or externalities associated with the learning process.[62] The theoretical case for government intervention in the presence of knowledge spillovers that arise from learning-by-doing is fairly straightforward. Such spillovers arise when the new producer who incurs costs in order to discover the best way to produce a particular product, cannot appropriate all the productivity gains that are generated. If information becomes freely available to potential competitors, competition will raise factor prices or compress the product's price to a point where the initial firm cannot recover its total costs. Without government intervention, individual entrepreneurs will not have adequate incentive to invest in knowledge acquisition. When private marginal costs of production exceed social marginal costs, because other firms benefit from a given firm's output, then an output subsidy is the policy instrument of choice. Trade policies are next best, as they promote learning but also introduce a negative volume of trade effect.[63]

58 See Grossman and Horn (1988) for instance.

59 See World Bank (1993).

60 Lall (2002).

61 See World Bank (1993).

62 See Noland and Pack (2003) for a list of externalities related to the learning process.

63 See Grossman (1990).

A variant of this argument applies specifically to exports.[64] In the presence of spillovers from "learning-by-exporting", producers will be reluctant to start exporting in the absence of government interventions. An export subsidy granted to pioneer exporters may improve upon the market outcome. Other than direct export subsidies, this argument has been used to justify programs to subsidize and coordinate the exploration of foreign markets.[65] Some examples of such policies are presented in Box 6.

The controversy over this variant of the infant industry argument does not centre on analytical issues but rather on empirical and practical matters. One question relates to the pervasiveness of such situations. While learning-by-doing spillovers are often assumed to be pervasive, available evidence is relatively scarce and does not provide a very clear picture. The small existing body of work on the estimation of learning effects suggests that the importance of such spillovers might differ among industries. There is evidence that learning spillovers are present in nuclear power plant construction, wind-turbine production, the production of various memory chips and the chemical processing industry.[66] On the other hand, evidence suggests that there were little or no spillovers in Japanese steel in the 1950s and 1960s and across American shipbuilding yards.[67] Another empirical study, which examined learning-by-doing in the early American rayon industry shows that there can be considerable differences across firms in their ability to benefit from other firms' learning-by-doing.[68] Evidence regarding less developed countries is even more difficult to interpret. Based on their review of research in less developed countries, Bell et al. (1984) found little support for the claim that firms entering a new activity can learn costlessly from the experience of others, while Tybout (2000) in a similar but more recent review, notes that the best documented case of spillovers in less-developed countries is the Green Revolution in Indian agriculture.

There is some econometric evidence regarding information spillovers from exporting. Aitken et al. (1997) examine whether locating near other exporters increases the probability of exporting, using data on 2,104 Mexican plants over the period between 1986 and 1990. They find that the probability that a domestic plant exports is positively correlated with the proximity of other exporters, but only if the latter are multinationals. As a consequence, the authors highlight the importance of the presence of multinational enterprises in export processing zones. Clerides et al. (1998) find that the costs of breaking into foreign markets are negatively related to the number of firms that have already done so. However, Bernard and Jensen (2004) do not find any evidence of spillovers from exporting. They also do not find any effect of state export promotion on exporting.

The second matter of controversy relates to the administrative and fiscal feasibility of the policy interventions, their informational requirements, and their political economy consequences. Recent theoretical and empirical research on industrial development policy has focused on a slightly different market failure. It is related to informational externalities in the entrepreneurial process of discovering new profitable investment opportunities.[69] In open economies, new profitable investment opportunities would almost naturally involve export products. Diversification and the discovery of new opportunities for profitable production or export are closely linked to development. Empirical work by Imbs and Wacziarg (2003) shows that the relation between diversification and development has the shape of an inverted U. Diversification first increases with development but there exists a point, relatively late in the development process, where countries start specializing again. It is not clear whether the discovery activity simply occurs with economic growth or if it is a driver of subsequent growth.[70] There is also a considerable body of policy literature that emphasizes the benefits of export diversification.[71]

64 See Panagariya (2000).

65 See Rodriguez-Clare (2004).

66 See Zimmerman (1982), Hansen et al. (2003), Neij et al. (2003), Irwin and Klenow (1994), Gruber (1998) and Lieberman (1984).

67 Ohashi (2004) finds little intra-industry knowledge spillovers in Japanese steel in the 1950s and 1960s while Thornton and Thompson (2001) find strong learning effects but small spillovers across shipbuilding yards in the US.

68 See Jarmin (1994).

69 See Hausmann and Rodrik (2003).

70 On this last point, see Klinger and Lederman (2004).

71 See the introduction by G.K Helleiner in Helleiner (2002).

Box 6: Export assistance in WTO Members

Governments provide assistance to exporters by supporting activities dealing with export facilitation, information, image-building and participation in fairs. Export assistance to the business community has been available in industrialized countries for a long time, but availability of support services markedly increased since the 1970s.[1] Institutions responsible for the development and management of export promotion system vary across countries and involve the government, private sector organizations or a mixture of both. Export assistance activities can be divided into two groups: activities providing information on export opportunities to potential domestic exporters and activities providing information on domestic products and producers to potential foreign importers. The need for governments to intervene in export assistance has been justified on the ground of information spillovers from pioneer exporters on other potential exporters.[2]

The Table below gives an overview of export promotion activities offered by WTO Member governments according to the information provided in the Trade Policy Review reports from January 2004 to October 2005.[3] In the table commercial offices are only those that are explicitly mentioned as being branches of an export promotion agency. Embassies and consulates that fulfil the services of commercial offices abroad are not taken into account.[4]

Export promotion policies in WTO Members

	WTO Members
Information for and assistance to potential exporters	
on-shore activities: information	
information centres	Ecuador, Philippines, Republic of Korea, Switzerland
provision and management of trade data (bank)	Nigeria, Philippines, Suriname, Tunisia
on-shore activities: assistance	
quality control, certification etc.	Brazil, Republic of Guinea, Trinidad and Tobago
on-line business portal	Burkina Faso, Jamaica, Paraguay
training	Brazil, Burkina Faso, Ecuador, Jamaica, Nigeria, Tunisia
assistance in administrative matters	Egypt
assistance in product design and other advisory services	Japan, Nigeria, Sri Lanka, Switzerland
off-shore activities	
market surveys/ identification of market opportunities	Belize, Brazil, Burkina Faso, Egypt, Jamaica, Japan, Mongolia, Nigeria, Paraguay, Singapore, Sri Lanka, Switzerland, Suriname, Trinidad and Tobago, Tunisia
commercial offices	Ecuador, Jamaica, Singapore
Information for potential importers abroad	
on-shore activities	
organize domestic fairs and exhibitions	Belize, Republic of Guinea, Republic of Korea, Suriname, Tunisia
off-shore activities	
support exporters' participation in fairs and exhibitions abroad	Belize, Brazil, Burkina Faso, Japan, Nigeria, Philippines, Republic of Korea, Switzerland, Trinidad and Tobago
represent exporters in fairs and exhibitions abroad	Jamaica, Suriname, Switzerland
participation in trade missions	Burkina Faso, Nigeria, Republic of Korea
advertising abroad/ image building	Belize, Brazil, Egypt, Jamaica, Nigeria, Republic of Korea, Suriname, Switzerland, Trinidad and Tobago, Tunisia

1 Seringhaus and Botschen (1991).
2 See for instance Aitken et al. (1997).
3 See Box 17 for an explanation of the WTO's trade policy review mechanism. Trade Policy Review (TPR) reports use the term export promotion in the context discussed here, rather than export assistance. The term export assistance is chosen in this box in order to differentiate the activities discussed here from the broader term "export promotion strategy" as used in the rest of this Report.
4 See Rosen (2005).

Source: Trade Policy Review reports published between January 2004 and October 2005 and covering the following 29 WTO Members: Belize, Benin, Brazil, Burkina Faso, Ecuador, European Communities, Egypt, The Gambia, Jamaica, Japan, Liechtenstein, Mali, Mongolia, Nigeria, Norway, Qatar, Paraguay, Philippines, Republic of Guinea, Republic of Korea, Rwanda, Sierra Leone, Singapore, Sri Lanka, Suriname, Switzerland, Trinidad and Tobago, Tunisia, United States. No explicit export promotion programs have been reported in: European Communities, The Gambia, Mali, Qatar, Sierra Leone and United States. Rwanda has not set up any arrangements for export promotion.

Diversification of the productive and export structure requires learning what one is good at producing, which itself involves the "discovery" of an economy's cost structure. Producers must experiment with new product lines. They must discover whether it is cut flowers, soccer balls or computer software that can be produced at low cost. The problem is that this activity has a great social value but that the entrepreneur who makes the discovery can only appropriate a small part of its social value. If the entrepreneur fails in his venture, he bears the full cost of his failure. If he succeeds, others will follow and he will have to share the value of his discovery. It is important to distinguish discoveries as defined in this paragraph from innovation and R&D. What is involved here is not inventing new products or new processes but "discovering" that a certain product, already well established in world markets, can be produced at home at low cost.[72] This typically involves technological tinkering to adapt foreign technology to domestic conditions.[73]

In the presence of informational externalities of the type just described, laissez-faire leads to underprovision of "discovery" and governments need to play a dual role. They need to encourage entrepreneurship and investment in new activities *ex-ante*, but impose discipline and stop unproductive activities *ex-post*. A comparison of various types of interventions suggests that trade protection is not an efficient way of promoting self-discovery, while both export subsidies and government loans and guarantees have benefits and costs.[74] Export subsidies increase the returns to success while government loans and guarantees lower the losses in case of failure. Export subsidies do not discriminate between innovators and copycats, while government loans and guarantees do. But loans and guarantees distort risk assessment.

Hausmann and Rodrik (2003) provide indirect empirical evidence in support of the argument that inadequate incentives to invest in learning what one is good at producing hamper the development of non-traditional activities. They provide support from the literature on international trade, technology transfer and economic history for three separate propositions. The first proposition is that there is a large element of uncertainty about what a country will be good at producing, beyond broad aggregates such as "labour-intensive manufactures". Second, there are significant difficulties entailed in importing technology off-the-shelf and successful local adaptation requires considerable domestic tinkering. Third, domestic imitation often proceeds rapidly when the first two difficulties are overcome, bidding away the rents of the early incumbents.

Information problems faced by consumers have also provided arguments for interventions in support of infant industries. If industry pioneers have already developed their reputations among consumers, potential competitors offering similar quality products at similar or even lower costs may not be able to penetrate the market. The argument that information barriers might preclude efficient entry would seem to have relevance for a number of manufacturing and services industries.[75] Depending on their assumptions, different analyses have strikingly different policy implications. Under the assumption that firms do not choose the level of quality of their products, subsidies can be shown to improve domestic welfare.[76] However, under the assumption that firms can choose their products' attributes, output subsidies, which affect only the price that a firm receives for its product, will not solve the market failure. This is because subsidies reward reputable firms and fly-by-nights equally, and do not alter the incentives that firms face in choosing among these strategies. In such a case, policies that provide a differential incentive for firms to produce goods of higher quality such as minimum quality standards would be preferable.

Coordination failures have long been seen as an argument for government intervention.[77] Recent research suggests that coordination failures in taking the necessary actions to increase sector-wide productivity may seriously hamper development as they impede the emergence of activities where industry-specific local externalities are important.[78] Because production and investment decisions in the upstream and downstream parts of industry are often

72 See Hausmann and Rodrik (2003) and Hoff (1997).

73 In their survey of technological transfer, Evenson and Westphal (1995) list adaptations such as "technological efforts related to raw material control, product and process quality control, production scheduling, repair and maintenance, changes in production mix, etc."

74 See Hausmann and Rodrik (2003).

75 See Grossman and Horn (1988).

76 See Bagwell and Staiger (1988) or Mayer (1984).

77 See World Bank (1993) for instance.

78 See Rodriguez-Clare (2005).

interdependent, in the absence of coordination, profitable new industries can fail to develop. Building an airport in a region that has no hotels would not lead to any traffic, but hotels without a regional airport may not be profitable either. Similarly, a large scale irrigation project would not be profitable if there are only few farms using modern technologies, but using such technologies is profitable only if there is adequate irrigation.[79] Two conditions are necessary for coordination failures to arise: new industries must exhibit scale economies and some of the inputs must be non-tradable or require geographic proximity.[80] Under certain circumstances, coordination can be achieved without government intervention but a government role may be required in some cases.

The most efficient intervention in the presence of coordination failures is not a production subsidy. There is no need for production subsidies because all the investments, if they are made, are profitable. The purpose of the government's intervention is to ensure that all interrelated investments are made. This can be achieved through pure coordination or through *ex-ante* subsidy schemes. Examples of such *ex-ante* subsidies include investment guarantees or implicit bail-outs. One problem is that measures like these induce moral hazard and are prone to abuse.[81] Note that because all industries in principle have characteristics that could generate clusters, but at the same time many industries can operate in the absence of clusters, the appropriate policy should not be targeted on particular sectors but rather be targeted at the activity or technology that would contribute to solving the coordination failure.

Capital market imperfections are often seen as an obstacle to industrial development. Capital markets take on a critical role in the process of entry into a new industrial activity. They first intervene in one of the versions of the infant industry argument. In the presence of learning-by-doing, so this argument goes, a producer who could make profits in the long run may not enter the market due to higher costs in the early years than those of incumbent firms. Over time, profits would cover the initial losses but in the absence of well-functioning capital markets, the producer would not have access to the funds he needs. Economic theory tells us that the first best solution in this case is to correct the credit market imperfections directly. For instance, equity injections through venture capital firms would be preferable to protection or production subsidies.[82]

Capital market imperfections have also been used to justify credit subsidies and subsidized credit insurance, in particular for exports. The process of entry into a new industrial activity can only be efficient if producers can borrow funds at rates that reflect social cost plus a reasonable premium related to the risk associated with the new activity. However, capital markets are among those most affected by information problems. Equity markets are often weak or absent in developing countries, while credit is often rationed and seldom allocated to the highest bidder. The reason for this is that bidders are bidding promises while lenders are interested in the actual rather than the promised return. As a result, capital is allocated by a screening and evaluation process which is quite different from the one that would be associated with perfect markets. If for some reason the private cost of capital is higher than its social cost, the argument goes, governments must subsidize credits. If on the other hand, some information failure prevents a correct evaluation of the risk associated with new activities, the government should provide subsidized credit insurance.

In many countries government agencies exist to assist domestic companies in financing the export of domestic goods and services to international markets. These agencies include the Italian SACE, the French COFACE, the US Ex-Im Bank, the Japanese NEXI and the German EULER HERMES. They provide, for instance, working capital guarantees (pre-export financing); export credit insurance; and loan guarantees and direct loans (buyer financing). In many instances these activities result in the provision of subsidized insurance of export credits and/or the provision of credit finance at subsidized interest rates. See Box 7 for a further discussion on export credits.

79 Rodriguez-Clare (2005) provides several other examples of national and sector level coordination failures.

80 See Rodrik (1996). The cluster approach to development is based on a similar idea. See also the discussion of those conditions in Pack and Saggi (2006).

81 Moral hazard is defined as an insurance-induced alteration of behaviour that makes the event insured against more likely to occur.

82 Stiglitz (1993) discusses the role of governments in financial markets.

Box 7: The OECD Export Credit Arrangement

Under the auspices of the OECD, an Export Credit Arrangement came into existence in 1978. The Arrangement places limitations on the terms and conditions of officially supported export credits (e.g. minimum interest rates, risk fees and maximum repayment terms) and the provision of tied aid. It includes procedures for prior notification, consultation, information exchange and review for export credit offers that are exceptions to or derogations from the rules as well as tied aid offers. The participants to the Arrangement are: Australia, Canada, the European Community, Japan, Republic of Korea, New Zealand, Norway, Switzerland and the United States.

The OECD regularly collects data on the export credit activities of the members to the Export Credit Arrangement. The Table below gives information on the value of transactions covered by long-term export credits for the years 1998-2003. It also gives information on the allocation of export credits across sectors in the mentioned period. Around 40 per cent of total transaction value was allocated to transport and storage in most of the years, while around one-third was dedicated to energy-related activities. The bulk of the former transactions went to the air transport sector. A lot of the energy-related transactions were related to coal-fired, gas-fired or nuclear power plants and to "energy manufacturing". Note that separate sector understandings exist on export credits for ships, nuclear power plants, civil aircraft and – during a trial period up to June 2007 – for renewable energies and water projects.

Long-term (over five years) export credits by sector, 1998-2003
(Percentages and billion dollars)

SECTOR	1998	1999	2000	2001	2002	2003
	Percentage					
Agriculture	0.4	0.2	0.1	0.6	0.3	1.4
Communications	4.4	3.1	7.8	9.3	10.9	4.4
Construction	0.1	0.6	0.9	1.2	1.3	0.7
Other services	1.4	1.4	0.9	1.6	2.4	1.5
Energy generation and supply	22.6	19.9	26.5	10.4	10.0	19.0
Industry	24.4	14.4	20.4	25.0	27.9	14.6
of which chemicals	0.7	2.4	2.6	7.5	4.3	3.4
of which energy manufacturing	8.3	3.6	1.8	3.9	4.1	3.1
Fishing	0.0	0.0	0.0	0.0	0.1	0.0
Forestry	..	..	..	0.1	..	..
Mineral resources and mining	6.8	2.3	2.9	6.6	5.2	8.4
Transport and storage	38.1	55.7	39.0	43.2	39.2	47.6
Water supply and sanitation	1.0	1.7	0.8	1.4	2.2	0.6
Others	0.9	0.8	0.7	0.6	0.6	1.8
	Billion dollars					
TOTAL	88.6	113.8	121.7	110.4	96.7	100.0

Source: OECD (2005b).

From a theoretical point of view, this argument is not completely straightforward. Consider first the case for subsidized insurance. The case for intervention would need to rest on potential insurers' irrational aversion to risk or their systematic overestimation of the risk associated with new activities. It would also rest on the assumption that the government is better able than the private sector to assess risk. Economists do not see this case as very compelling.[83] Even the more sophisticated arguments, where the absence of an insurance market is explained by moral hazard or adverse selection, are not regarded as compelling because governments are not deemed to have a particular advantage over the market in dealing with those informational problems.[84]

[83] See Grossman (1990) and Panagariya (2000).

[84] See Panagariya (2000).

Similarly, in the case of credit subsidies, it has been argued that so far no compelling case for such subsidies has been articulated.[85] Grossman (1990) examines the precise market interactions that might give rise to a divergence between private and social discount rates. He shows that it may be difficult if not impossible for the government to know *ex ante* whether to encourage or discourage investments in some new activity to compensate for the biases stemming from imperfections in private capital markets. His conclusion is that a cautious policy response to alleged capital market imperfections seems advisable.

(c) Implementation issues

Much of the discussion regarding the merits of industrial development policies has focused on the administrative and fiscal feasibility of government interventions, their informational requirements, and their political economy consequences. Economists typically agree on the theoretical case for government intervention in the presence of market failures, such as those discussed above, although there is some disagreement regarding the empirical relevance of the cases that have been identified. However, as already mentioned, there is a clear divergence of views on the feasibility issue, which is closely related to the divergence in the interpretation of the East Asian success stories and other experiences. This subsection considers the feasibility issue while the next one summarizes the debate on the lessons to draw from existing experiences.

Lall (2002) proposes a useful typology of export promotion policies that can be applied to industrial policy interventions. He first distinguishes between two groups of policies according to the nature of the market failure they are supposed to address. The first group includes "permissive policies", that is, policies aimed at removing distortions created by policies that deter exporting or more generally the development of new activities. This group includes mainly policy reforms aimed at reducing macro-policy mismanagement and uncertainty, make exporting profitable and minimizing transaction costs to producers. Permissive policies are fairly uncontroversial.

The second group comprises "positive policies" to overcome structural market deficiencies in the creation of new advantages. Positive policies aim mainly at encouraging new activities. They can be subdivided into functional and selective interventions. Functional interventions are market-friendly interventions aimed at addressing market failures without directly modifying resource allocation between specific activities. Examples of functional policies would include improvements in physical infrastructure, human capital or the functioning of capital markets, or the provision of information and technical support to potential exporters. Functional policies are also relatively uncontroversial.[86] Selective interventions are the most controversial. They intend to influence resource allocation, through specific subsidies or protection, credit direction, creation of specific skills or technologies, promoting large firms or attracting specific investors, etc.

The mainstream view of development, often termed the "market friendly" view, would accept the need for permissive and functional interventions but reject the use of selective interventions.[87] In the mainstream view, only the failures that call for functional interventions should be addressed. Failures that require selectivity are either unimportant or cannot be remedied. In other words, either the cost of selective market failures is low enough not to matter, or it is lower than the cost of government failures. This view has been criticized on the one side by those who think that getting the prices right is sufficient for an economy to reach optimality, and that neither functional nor selective measures are justified. On the other side, there are those who think that market failures are important and pervasive, and that effective remedies can be devised.[88] The espousal of this view implies a crucial role for governments, including through selective interventions.

Various arguments against selective interventions have been discussed in the literature. Among the main arguments are that developing countries lack the competent bureaucracies to render such interventions effective, that governments cannot pick the winners and that interventions are prone to political capture and corruption. The following paragraphs discuss these arguments in more detail.

85 See Panagariya (2000) and Grossman (1990).

86 Certain functional policies, such as investment in transport infrastructure, may be relatively uncontroversial from an economic perspective, but controversial from an environmental perspective.

87 See Noland and Pack (2003) for a recent restatement of the mainstream market-friendly position.

88 A "strong" neo-classical position would accept only permissive interventions while a structuralist or revisionist view would support certain selective interventions.

First, the implementation of selective interventions requires a considerable amount of information and skill.[89] As discussed, domestic market failures should be corrected by domestic policies aimed directly at the source of the problem. Governments thus need to have fairly detailed information about the nature and the location of market failures that need to be addressed. For instance, governments would need to identify industries where domestic producers would have a comparative advantage but where learning spillovers prevent the development of a local industry. However, market failures such as learning spillovers or coordination problems are typically hard to identify precisely, so that it tends to be difficult to be sure about the appropriate policy response. There is no reason to assume that the government is well informed or even that it is better informed than the private sector. Moreover, it has been shown that the administration of export subsidies in particular tends to be "organizationally demanding".[90] Technical and administrative skills are needed to understand and design strategies and interventions, to implement and improve them over time, to communicate with the private sector and to ensure that agency problems are overcome.[91] Such skills are often in short supply in developing countries.

Various authors consider that information and skills problems should not be exaggerated. In their view, governments have to decide upon which path they set the economy, but they do not need to assess the costs and benefits of different outcomes. More importantly, they believe that even good decision-making by governments necessarily involves errors.[92] According to Rodrik (2004), the key is to make sure that the State and the firms work together. Public officials need to be able to elicit information from the business sector on an ongoing basis about opportunities, constraints, technological and market parameters and local capabilities. The problem is that, as discussed below, with increased proximity between the government and private interests the risk of capture increases.

Second, industrial policy is open to political capture, corruption and rent-seeking. The neo-classical political-economy literature on trade policy shows how government intervention is likely to produce inefficiencies. Decision-makers in the public sector are modelled as individuals who maximize their welfare and not necessarily the welfare of society. Several conclusions emerge from this type of analysis.[93] Because discretionary behaviour by government officials comes at a cost, a rules-based policy regime which entails high degrees of pre-commitment is advantageous. Moreover, policy stability and predictability help coax the desired response from the private sector. Finally, policies that create rents also create rent seekers. Bureaucrats thus have an incentive to create rents. These conclusions lead to an obvious conclusion: policy interventions should be avoided and the role of the government should be minimized, but in any case, private groups should be kept at arms' length from the government. The risk of political capture is even higher for selective interventions with all the difficulties associated with their implementation. As regards the infant-industry argument, political economy models suggest that while the infant-industry argument is typically an argument for temporary interventions, policies tend to get captured by special interests and become permanent.

While most economists would agree that the results from these "public choice" models are useful to understand the effect of industrial policies, they would not all agree with the broad policy conclusions that have been derived from those models. The latter argue that government capabilities can be improved, that the degree of selectivity can be adapted to the level of capabilities, and that governments can be helped to intervene efficiently.[94] Rodrik (1993) suggests that academic economists' views on state capabilities is superficial and that there is much to be learned by undertaking systematic analytical studies of state capabilities. Rodrik (2004) goes one step further and proposes an institutional framework for "redeploying industrial policy in a more effective manner". The principal-agent model, with the government as the principal and the firms as its agent does not work well, notwithstanding the articulation of an optimal policy that aligns the firms' behaviour with the government's objectives at least cost. Ideally, one would need a more flexible form of strategic collaboration between the public and private sectors, designed to elicit information about objectives, distribute responsibilities for solutions, and evaluate outcomes as they appear.

89 See Pack and Saggi (2006).

90 See Levy (1993).

91 See Lall (2002).

92 See Stiglitz (1996).

93 See Rodrik (1993) and Shapiro and Taylor (1990).

94 See Lall (2002).

There are also reasons to believe that from the point of view of implementation, export promotion has some advantages compared with import substitution. Panagariya (2000), while generally in favour of laissez-faire, points to two reasons to prefer export promotion to import substitution on political economy grounds. The first is that chances to pick an industry where the country has a comparative advantage are better and the second is that the costs of subsidies, which show up in budgets, are more transparent than those of tariffs. Along similar lines, Noland and Pack (2003) come to the conclusion that the use of export performance to measure success rather than the provision of open-ended protection for inefficient sectors explains why Asian industrial policies have a better record than import substitution experiences elsewhere. They note that as a purely practical matter, performance in world markets was probably the criterion least amenable to rigging by the firms or their bureaucratic counterparts.

Two further points have been raised against the use of selective policies. One is that most interventions, and in particular subsidies, use scarce resources.[95] Yet the opportunity cost of industrial policy interventions and the deadweight loss often imposed on other sectors by taxes used to pay for subsidies are typically not taken into account in policy assessments. This is a very general argument but not necessarily one that would condemn all selective interventions. Clearly, resource costs should be taken into account. The other point, which will be discussed in Section F below, is that multilateral disciplines restrict the use of some selective interventions. And more generally, in the case where interventions have a negative impact on third parties, the risk of retaliation should be taken into account.

(d) Export Processing Zones and industrial development

Export processing zones (EPZs) have been established over decades and today significant shares of developing countries' manufactured exports originate in EPZs. This Section defines EPZs as geographic areas that offer firms established within them more liberal trade conditions and a more liberal regulatory environment than common within the relevant country.[96] Note that this definition therefore does not include *maquiladoras* that distinguish themselves from other companies purely through their economic activities and not necessarily through their location. Paraguay, for instance, has different legislations for *maquiladoras* and for EPZs, with *maquiladoras* being defined as companies that perform value-added activities for foreign companies using the goods and services provided by those foreign companies. Those value-added activities include transformation, elaboration, repair, assembly or industrial processing. The final products of the *maquiladoras* are expected to be re-exported, but *maquiladoras* do not need to be located in specific zones. Traditionally, EPZs have been considered to specialize in the export of manufactures, but some of them have increasingly engaged in the exports of services.[97]

The incentives provided differ in nature and can change over time. One might consider the bulk of these measures as indirect subsidies, as direct cash payments are typically avoided. In most cases, a special legal infrastructure is provided at the outset. Most EPZs offer a combination of three types of incentives to companies established in the relevant area. First, many EPZs are characterized by a transport and telecommunication infrastructure that is superior to the one generally found in the country. A number of services may also be provided by the government at below cost to firms established in the zone. Second, import and export duties are typically waived on the trade flows between the EPZ and foreign countries. Third, profits from EPZ activities tend to be exempt from income and/or corporate tax for a number of years.

In many cases, the aim behind the special incentives provided in EPZs seems to have been to attract foreign companies. The idea was that foreign investment would create jobs and lead to positive spillovers on the rest of the economy, thus stimulating overall growth.[98] More recently, the literature has put stronger emphasis on the role EPZs can play as a transition tool from a closed to an open economy.

On the basis of optimal tax theory, it can be argued that taxes should be lower for activities that are more sensitive with respect to the tax rate. To the extent that FDI is more "footloose" than domestic investment, fiscal incentives

95 See Noland and Pack (2003).

96 In the same context a variety of terminologies, such as industrial free zones, free trade zones and special economic zones have been used in the literature and by policy makers. See Madani (1999) for an overview.

97 See, for instance, WTO (2005a) on the importance of IT exports for Jamaica's EPZs.

98 See Pack and Saggi (2006).

for foreign investors in EPZs can therefore be justified. In principal, such incentives could have a permanent character, but the literature has stressed that the benefits from such fiscal incentives are likely to be reduced or eroded in the case of tax competition from other countries.[99] Tax incentives, therefore, do not necessarily trigger more FDI. Even if an EPZ manages to attract FDI, the benefits of such FDI for the economy as a whole will largely depend on the linkages that take place between firms based in the EPZ and other domestic firms.[100]

EPZs have also been regarded in the literature as a useful stepping stone from a closed economy to a fully open and integrated economy.[101] In particular, they may address two types of challenges countries face when liberalizing their trade regime and in this context could be interpreted as an example of the permissive or functional policy interventions discussed previously. The first challenge is the one society faces due to the change in price signals following liberalization. Such changes may trigger significant and sometimes costly transition processes and may have important impacts on income distribution. Depending on the extent of such changes, they may trigger serious economic hardship for some, and lead to opposition against reform and/or other social conflicts.

An attractive feature of EPZs is that they restrict such price changes to certain geographic areas. If companies based in EPZs are exempted from import and export charges, they face "correct" price incentives. New profit opportunities are thus given at the margin, while the disruption of existing economic activities is minor. The gains from such "partial" liberalization are likely to be limited, though, and ultimately the authorities should consider extending trade liberalization to the rest of the economy. It has been argued in the literature that the existence of EPZs may create a protectionist bias in the long-run, as companies based in the EPZ have no incentive to lobby for further liberalization. Overall, political pressure in favour of full liberalization would therefore be lower in countries with established EPZs than in countries without EPZs.[102] If this is the case, the effectiveness of EPZs as an adjustment tool would be significantly hampered.

The second challenge refers to the introduction of complementary policies necessary for successful trade liberalization that have been emphasized in the recent trade literature.[103] In particular, it has been argued that the lack of appropriate infrastructure can seriously impede countries' supply response to trade liberalization. Given limited government resources, especially in developing countries, it would be very difficult to make the necessary investments in infrastructure prior to or in parallel with trade liberalization on an economy-wide basis. EPZs are often provided with better infrastructure than the rest of the country. Upgrading the infrastructure for companies engaged in exporting then levels the playing field with respect to competitors abroad. The provision of infrastructure in EPZs can thus be seen as a stepping stone towards the provision of high quality infrastructure in the entire economy. The use of this policy tool in EPZs does not create the type of protectionist bias that has been discussed in the previous paragraph.

Trade Policy Reviews provide information on the existence and characteristics of export processing zones and other "free zones" in WTO Members. Among the 29 Members reviewed between January 2004 and October 2005, 17 were reported to have adopted some type of free zone. Japan, Liechtenstein, Norway, the Republic of Guinea and Qatar were reported not to have any EPZs. In Rwanda, Suriname and Sierra Leone, relevant legislation concerning the establishment of EPZs was still under consideration at the time of the report, and in Mongolia such a law had existed since 2002 but no EPZ had been created by March 2005.[104]

99 See, for instance Rodríguez-Clare (2004).

100 See the next subsection for evidence of the effect of EPZs on host economies.

101 See Schweinberger (2003) for a general modelling framework for special economic zones. The paper contends that by imposing appropriate employment taxes and/or subsidies in conjunction with the creation of the special economic zone, the special economic zone: (a) results in an increase in government revenue; (b) does not generate conflict among households; and (c) brings about structural change only in the geographic entity declared special economic zone. See also the discussion in Rodrik (2002) on the role of EPZs and special zones in Mauritius and China.

102 Cadot et al. (2003) develop this argument with respect to duty-drawbacks.

103 See for instance WTO (2004).

104 The TPR reports for Burkina Faso and Mali make no reference to Export Processing Zones. The TPR for Switzerland makes reference to the existence of Free Ports that provide warehousing facilities. The trade policies of Liechtenstein and Switzerland are reviewed together in one Trade Policy Review report. See the footnote in Box 6 for the list of Members reviewed in the relevant period.

Table 1 provides an overview of the characteristics of the free zones in the other 17 surveyed Members. The Table shows that in most free zones established companies benefit from tariff reductions or exemptions on imports and from tax reductions or exemptions related to their revenue. Normally companies established in the zones and taking advantage of those benefits are supposed to export most of their production and limits exists on the amount of goods or services that can be supplied to the territory in which the EPZ is located. In other zones, companies can sell their products or services where they want but the tax and duty benefits only apply to the share of their production that is exported. Ecuador is an exception to this rule, as companies in the free zones do also not appear to be required to pay income tax for their sales to the customs territory of Ecuador. This may explain why around 70 per cent of the free zones' exports went to the customs territory of Ecuador between 2000 and 2003.

Through their tax and duty reductions, companies in the free zones face different price signals than other companies. But in some zones companies also have other cost advantages, in particular relating to infrastructure and regulatory costs. Most zones offer simplified import and export procedures to their users. Setting up a business is also frequently easier within the zones than in the national customs territory. In Jamaica, Nigeria and Tunisia, support is also directed to the development of infrastructure within the free zones or to facilitating access to other services that may be relevant for users.

Table 1
Instruments used in export processing zones or other "special zones" according to TPRs, January 2004-October 2005

	Classification of activity	Member
1	**Direct Payments**	
	Investment Support	Tunisia
	Reimbursement of transport costs for exports	Tunisia
2	**Provision of infrastructure and other services below cost**	
	Infrastructure development	Nigeria
	Ware housing facilities	European Union, Nigeria, Singapore, United States
	Preferential land rental	Nigeria, Sri Lanka
	Others	Jamaica, Nigeria
3	**Tax Breaks**	
	Profit/corporate/income/sales tax relief	Belize, Brazil, Ecuador, Egypt, The Gambia, Jamaica, Republic of Korea, Nigeria, Paraguay, Philippines, Singapore, Sri Lanka, Trinidad and Tobago, Tunisia, United States
	Facilitated repatriation of profits	Nigeria
4	**Tariff reductions or exemptions**	
	Duty drawbacks/exemptions for imports/ VAT refunds for imports	Belize, Benin, Brazil, Ecuador, Egypt, European Union, The Gambia, Jamaica, Republic of Korea, Nigeria, Paraguay, Philippines, Sri Lanka, Trinidad and Tobago, Tunisia, United States
	Exemptions from export taxes	Belize
5	**Other**	
	Special regime for labour relations	Egypt, Nigeria
	Simplified commercial procedures related to imports (for instance: no import or export licensing required, no quantitative restrictions)	Belize, Ecuador, Egypt, Jamaica, Republic of Korea, Nigeria, Paraguay, Trinidad and Tobago
	Simplified procedures to set up commercial activity	Ecuador, Nigeria

Source: Trade Policy Review reports published between January 2004 and October 2005.

The relevance of EPZs for a country's trade differs significantly across countries.[105] Exports from EPZs represented only 0.3 per cent of Nigeria's merchandise exports in 2003, 1.6 per cent of Trinidad and Tobago's exports in 2004 and 2.1 per cent of US exports in 2001.[106] In Sri Lanka, by contrast, exports from EPZs represented 25.1 per cent of total merchandise exports in 2002, while in Jamaica the relevant percentage went down from 21.8 per cent in 1996 to 8.8 per cent in 2000.[107] EPZs also play an important role in Bangladesh, the Dominican Republic, El Salvador,

105 Employment in EPZs is estimated to be around 13 million at the global level (ILO, 2003).

106 Figures based on information provided in relevant Trade Policy Reviews and own calculations.

107 Figures based on information provided in relevant Trade Policy Reviews and own calculations.

Morocco and Tunisia. Information from national statistics reveals that EPZ exports represented 19 per cent of total merchandise exports in Bangladesh in 2002/03, 76.8 per cent in the Dominican Republic in 2004, 55.3 per cent in El Salvador in 2004, 37 per cent in Morocco in 2003 and 69.3 per cent in Tunisia in 2002.

(e) Empirical evidence regarding the effects of industrial development subsidies

As already mentioned, the experiences of East Asian economies with industrial policy and the issue whether they might teach any lesson to other developing countries figure prominently in the debate about the role of government intervention in development policies. Given the prominent role played by subsidies in East Asian export promotion strategies, these experiences are particularly relevant. This subsection does not survey the wealth of literature on this topic – others have done it – but rather presents the main arguments in the debate.[108] Some of the principal results in the literature concerning other more recent experiences are also presented.

Early explanations of the growth performance of the Republic of Korea and Chinese Taipei emphasized the importance of getting the fundamentals right and outward orientation with few price distortions. In the 1980s, however, several scholars pointed out that these two economies had also used selective interventions, such as incentives to individual sectors, restrictions on trade and inward FDI and tight control of the financial sector. In 1993, in a Report entitled "The East Asian Miracle", the World Bank proposed a compromise interpretation. It acknowledged the important role of both getting the fundamentals right and export-push strategies. The Report suggested that in Japan, the Republic of Korea and Chinese Taipei, incentives were neutral on average, with export incentives offsetting substantial remaining protection. Firm-specific export targets were also part of the Republic of Korea's export promotion strategy, but actual exports often exceeded the targets. Governments made efforts to promote specific export industries. They also gradually reduced protection, and provided institutional support to exporters and a duty-free regime for inputs used in exports. The World Bank found that "... in some instances, government interventions resulted in higher and more equal growth than otherwise would have occurred. However, the prerequisites for success were so rigorous that policymakers seeking to follow similar paths in other developing economies have often met with failure." The Report mentions two prerequisites: institutional mechanisms which allowed the setting of clear performance criteria for selective interventions and to monitor performance, and mechanisms that prevented the costs of interventions becoming excessive. The benefits from using exports as a performance yardstick are strongly emphasized in the Report.

Partly catalyzed by the publication of "The East Asian Miracle", an enormous amount of empirical research on the effect of selective industrial policy has since been conducted. Noland and Pack (2003) survey this research and conclude that, on balance, the weight of the evidence derived from both econometric and input-output studies indicates that industrial policy made a minor contribution to growth in Asia. Empirical work on Japan, the Republic of Korea and Chinese Taipei fails to find links between interventions and sectoral productivity growth or trade performance. Available evidence also fails to prove that the rate of productivity growth in "neglected" sectors was increased indirectly by the growth of the favoured sectors. Evidence suggests, however, that in both Japan and Chinese Taipei the pattern of interventions was driven more by political economy considerations, such as sectoral employment, the presence of large firms, or the degree of sectoral concentration, than by dynamic comparative advantage.

The main factors that contributed to the "Asian Miracle" were good macroeconomic policy, including limited government deficits, low rates of inflation, and very stable real exchange rates.[109] These factors were conducive to high rates of saving and investment, which played a critical role in the growth story. Another critical component was the bias towards exporting. Noland and Pack mention four other reasons why the East Asian experience should not be seen as a justification for selective interventions. First, the policies deployed were exceptionally complex and were implemented under conditions of political stability by highly competent bureaucracies. Second, the financial crisis in the late 1990s should be factored into the assessment of the policies. Third, the tightened rules of the multilateral system would make it more difficult to use some of the instruments that were used by Japan, the Republic of Korea and Chinese Taipei. Fourth, the experiences of Hong-Kong, China and Singapore show that there are alternatives to selective interventions.

[108] See Hernandez (2004), Noland and Pack (2003) and Lall (2002).

[109] See Noland and Pack (2003).

Rodrik (2004) has a different interpretation of the East Asian experience. He argues that industrial policies have played a role in most non-traditional export success stories around the world, notably in East Asia. The fact that the literature provides numerous examples of success and failure stories of individual projects fits very well with his argument that even under optimal incentive programmes, some of the investments that are promoted will turn out to be failures. Optimal cost discovery requires equating the social marginal cost of investment funds to the expected returns of projects in new areas. The realized return on some of the projects will necessarily be low or negative, to be compensated by the high return on the successes. Lall (2002) discusses various indicators of the performance of East Asian Tigers and loosely relates them to the policies they pursued. He argues that the export success of the Tigers suggests that they "did something right" in mounting their selective interventions. However, he also discusses extensively the conditions that made this success possible and notes that selective interventions could work so well only because the institutional setting was appropriate. His conclusion is that "when all is said and done, there does remain some scope for the use of selective policies to promote exports, but its exact scope still has to be delineated."

Chang (2002) also supports the use of activist industrial policies. He examines the experiences of a range of now developed countries including the United Kingdom, the United States, Germany, France, Sweden, Belgium, the Netherlands, Switzerland and Japan and considers what kinds of industrial, trade and technology policies they used in the early stages of their development. He shows that almost every one of those countries used infant-industry protection and other activist industrial policies when they were catching-up economies. There was a considerable degree of diversity among those countries in terms of their policy mix. Other tools that were used include export subsidies, tariff rebates on inputs used for exports, conferring of monopoly rights, cartel arrangements, directed credits, and support for R&D. Chang, however, does not provide evidence regarding the effect of activist policies on economic performance.

Evidence concerning the effects of export subsidies and other export promotion measures is also mixed. There is evidence that selective governmental intervention in support of particular forms of non-traditional exporting activity – both through special incentives and through other types of encouragement and support, including specific training and research, credit, and marketing assistance – were important to the development of non-traditional exports in Chile and Costa Rica.[110] In Costa Rica and to a lesser extent in Chile, active policies to encourage FDI into "priority" sectors played a role.

In other regions, export promotion policies were less successful. Ndulu et al. (2002) describes export promotion programmes in Tanzania and assesses their impact. In the post-1984 period, a combination of macro-policy incentives and specific policies led to an initial swift response and general upswing in non-traditional exports. For various reasons related to difficulties with the implementation of the measures and more general supply-side constraints, however, the momentum was not sustained. Implementation problems were also identified in other African countries. Reviewing the system of export incentives in 13 African countries, Hinkle et al. (2003) conclude that no sample country came anywhere close to international best practice for export incentives.

Panagariya (2000) reviewed cases of export subsidies in Asia and Latin America where scanty results did not seem to warrant the costs incurred during decades of export subsidization. Conversely, he found that as soon as trade liberalization and sound macroeconomic policies were pursued, good progress on exports was made despite a simultaneous and sharp reduction of export subsidies. Nogues (1989) reviewed a large number of country experiences and concluded that the diversification of exports towards manufactures occurred when policies of more open import regimes and relative stability in real exchange rates were pursued. In contrast, the provision of export subsidies was not a common element among successful countries. He found that subsidizing countries faced large opportunity costs and an additional waste of resources through rent-seeking activities induced in the private sector.

While EPZs have triggered a rise in exports, job creation and income generation in some cases, the literature suggests that they have frequently not fulfilled the expected role of "engines of industrialization and growth" as some proponents had anticipated.[111] Helleiner (2002) notes that in Kenya, South Africa, Tanzania and Zimbabwe EPZs were not important contributors to non-traditional export success. But EPZs played a critical role in the case of Mauritius. The five studies

[110] See the essay by Agosin (2002) on Chile and the essay by Rodriguez (2002) on Costa Rica in Helleiner (2002).

[111] See the references in World Bank (2004).

of African countries in Helleiner's work also show that FDI has not as yet made a particularly important contribution to African non-traditional export expansion. Even in the Mauritius EPZ experience, domestic investment was dominant. Subramanian and Roy (2001) compare the Mauritian success with the failures of EPZs in other countries and link the difference in impact with differences in implementation. Madani (1999) concludes that EPZs can only play a dynamic role in a country's development under certain conditions – including an appropriate setup and good management – and this only as a transitional step in an integrated movement toward general liberalization of the economy.

2. INNOVATION AND SUPPORT FOR NATIONAL CHAMPIONS

Innovations are an important driver of economic growth. They spur growth in the country where innovations take place, at least if the country manages to make use of these innovations in economic terms. They also spur growth in countries that manage to understand, use, produce and commercialize the innovations made elsewhere. In other words, it is not only the "creation" of innovations that matters for growth but also the absorption of innovations made by others. This subsection will only deal with the first aspect of innovation, i.e. with innovations at the global knowledge frontier, and not with the absorption of innovations that has to some extent been dealt with in the previous subsection.

Innovations may be radical, consisting in the invention of completely new processes or products, or incremental, improving upon existing products or processes. Both types of innovations tend to be the outcome of previous efforts and investments in research and development and the required investments are frequently significant. Given the often lucrative returns to the successful introduction of innovation, private entities can be expected to be interested in conducting research and in paying for it. Yet governments around the world have traditionally intervened in R&D activities. They have done so by supporting education and thus human capital formation necessary for R&D activities. But they also sponsor R&D activities directly, both in public establishments, like universities, or in private entities. Economists justify such government intervention on the grounds of two characteristics of research and development that trigger market failures. The first justification is linked to the fact that innovations have public-good characteristics and the second to the size of R&D costs and ensuing economies of scale in R&D intensive industries. The discussion in Section C indicated that both characteristics would lead economists to conclude that the private sector is likely to invest less in R&D activities than would be desirable from the country's point of view.

R&D efforts aim at creating knowledge and knowledge has public-good characteristics, making it likely that the benefits of the created knowledge for society exceed those that the creator of the knowledge is able to appropriate. This is so because knowledge generated through an R&D effort may spread and once others have acquired the knowledge they may use it to their own benefit. R&D activities thus give rise to positive externalities – that is, benefits for actors that are not involved in the original R&D activities. The fact that private companies do not take those positive spillovers into account when making their investment decision with respect to R&D is likely to result in under-investment in R&D from society's point of view. Governments may therefore want to intervene in order to increase investment in R&D.[112] The relevance of knowledge spillovers was already raised by Marshall in the 1920s and has been discussed in the 1960s by economists like Arrow. While the existence of such spillovers has never really been questioned, economists still only have a partial understanding of their precise nature. Yet it would be necessary to understand how spillovers take place to determine the best type of policy intervention to stimulate R&D.

It is generally accepted that intellectual property rights, like patent protection, can help to correct the market failure caused by positive knowledge spillovers to a significant extent. A patent guarantees to its owner the sole use of a patented invention during a specified period of time. During that period the patent owner will be able to reap monopoly benefits from the new product or process and will thus be able to recover the initial investments made in R&D, at least to some extent. Once the patent expires others will be able to use the knowledge contained in the patent and potentially compete with the original inventor in the relevant market. The length of the patent protection will to a large extent determine whether the appropriate balance is struck between encouraging R&D investments on the one hand and allowing society to benefit from knowledge spillovers generated through these investments on the other. In a global set-up, intellectual property right protection needs to be international in order to maintain the incentives for R&D investments.

[112] See, for instance, the discussion in Grossman (1990).

Although appropriate intellectual property right protection helps to encourage R&D, it may not be possible to design it in such a way that spillovers are completely internalized. Private investment in R&D would thus continue to be suboptimal. Besides, intellectual property right protection does not help to overcome the other market failure that may be relevant for R&D activities – the one arising due to the high levels of investment needed for R&D. High fixed costs, in terms of high initial R&D investments, give raise to increasing economies of scale. This may lead to situations where a private company would never be able to recover the initial R&D costs (even in the absence of spillovers) and would as a consequence never make the initial investment. From the point of view of the economy, however, the investment may be desirable because it leads to significant consumer gains.[113] Empirical research confirms the relevance of this argument. It has been shown that consumer benefits from major new innovations have been quite large compared with the research costs borne by the innovators.[114] Government support for major new innovations may thus be justified, although it may be difficult for the government to identify the most promising R&D efforts.

The weight of R&D in economic activities appears to have increased over time and around the world. At the global level R&D expenditure represented 0.85 per cent of GDP in the 1990s compared with 0.42 per cent in the 1960s.[115] High-income countries invest significantly more in R&D than developing countries. The median level of R&D expenditure in high-income countries reached 1.19 per cent of GDP in the 1960s and 1.73 per cent in the 1990s.[116] The corresponding figures for developing countries are 0.21 per cent in the 1960s and 0.59 per cent in the 1990s. There seems to be some agreement in the economic literature that industrialized countries have a comparative advantage in R&D-intensive activities and that they should therefore allocate more resources to such activities. Developing countries, instead, should put more weight on enhancing their capacity to absorb new innovations than on participating in cutting-edge research. Rodríguez-Clare (2004), for instance, argues that only the more advanced countries should focus on research and development and relates his argument to the recent finding by Imbs and Wacziarg (2003) that growth is associated with increased diversification in production during earlier stages of development and only later on with increasing concentration, i.e. increasing productivity in existing activities.

Other authors are more nuanced and acknowledge that distinctions need to be made among different groups of developing countries. Watson et al. (2003) distinguish three types of developing countries: scientifically-proficient countries (e.g. Brazil, China, India and South Africa), scientifically-developing countries (e.g. Colombia, Indonesia and Pakistan) and scientifically-lagging countries (e.g. Nepal, Mali, Ecuador, Libya). The first group contains countries that define their relationships with the scientifically-advanced countries on the basis of equality or near equality, the second group contains countries that have pockets of adequate scientific and technological capacity amidst general scarcity, while such capacity is almost entirely lacking in the third group. For the third group it would be unwise to focus on knowledge advancement or cutting-edge research, in particular when taking into account their resource constraints.

A cursory look at expenditure on research and development in a number of developing and developed countries in recent years confirms the idea that more advanced economies invest more in R&D. Table 2 shows that economies like Japan, the United States and, to a lesser extent, the European Union spend a significantly higher share of their GDP for research and development than countries like Brazil, India and China. The Table reflects R&D expenditure from private and public domestic sources and from foreign sources. The role of the business sector and the government in R&D funding differ significantly across countries. The business sector accounted for almost 62 per cent of funding in OECD countries in 2003. This value reflects more or less the share of business funding in the United States, whereas Japanese companies participate more in national

113 See, for instance, the example of a monopolist facing high fixed costs as discussed in Grossman (1990). In a case of large fixed costs, it is possible that the price consumers are willing to pay remains below average costs, but that consumer surplus and the firm's revenue together exceed the total cost of production for certain levels of output. In such cases production is not profitable for the company, but may be desirable from a welfare point of view. For more detail, see the discussion of the market failure occurring as a result of so-called economies of scale in Section C of this Report.

114 See for instance Bresnahan (1986) and Trajtenberg (1989).

115 These values refer to median levels and are based on information provided in Lederman and Saenz (2005). The values refer to R&D expenditure financed by the productive sector, the public sector and foreign sources. Separate values for R&D financed by the public sectors are not provided in the article.

116 Country groupings as defined in Lederman and Saenz (2005).

R&D efforts (74 per cent of total R&D expenditure) and European companies less (55 per cent of total R&D expenditure). In developing countries the role of the private sector in R&D spending tends to be lower. It was, for instance, 40 per cent in Brazil in 2003 and 23 per cent in India in 2000.

Table 2
R&D expenditure as percentage of GDP, 2000-03

	2000	2001	2002	2003
Argentina	0.4	0.4	0.4	0.4
Brazil	1.0	1.0	1.0	1.0
China	1.0	1.1	1.2	...
EU (15)	1.9	1.9	2.0	2.0
EU (25)	1.8	1.8	1.9	1.9
India	0.9	...	...	...
Japan	3.0	3.1	3.1	3.2
Mexico	0.4	0.4	0.4	...
South Africa	0.6	...	0.7	...
Tunisia	0.5	0.5	0.6	...
United States	2.7	2.7	2.7	2.6

Source: RICYT (Argentina, Brazil and Mexico), OECD MSTI Database May 2005 (EU(15), Japan, United States). UNESCO, Science and Technology Indicators March 2005 (China, India, Tunisia and South Africa). The values for South Africa represent values for the years 1998 and 2002.

When concentrating on government expenditure on research and development,[117] the difference between developing and developed countries in our sample is less clear-cut, as illustrated in Table 3. Brazil, the European Union, India and Japan all allocate around 0.6 per cent of their GDP to research and development. Government expenditure on R&D is highest in the United States, and reached 0.81 per cent in 2003. In 2005 nearly two-thirds of the US government's R&D budged was devoted to defence.[118] For most countries in Table 3 where data are available, government expenditure on R&D represented a relatively stable share of GDP between 1999 and 2003.

Table 3
Government financed R&D expenditure as percentage of GDP, 1999-2003

	1999	2000	2001	2002	2003
Argentina	...	...	...	0.29	0.29
Brazil	...	0.61	0.64	0.59	0.56
China	...	0.33	...	...	...
EU (25)	0.63	...	0.64	0.64	...
India	...	0.65	...	...	...
Japan	0.58	...	0.57	...	0.56
Mexico	...	0.26	0.27	0.27	...
South Africa[a]	0.24	...	...	...	...
Tunisia	...	0.42	0.47	0.54	...
United States	0.76	...	0.76	...	0.81

[a] Data refer to 1998.
Note: Governmental expenditure represents the sum of direct expenditure by government and expenditure by higher education for the data coming from RICYT and UNESCO. For the relevant countries the values in this table may be overestimated to the extent that higher education R&D is actually financed by the private sector.
Source: RICYT (Argentina, Brazil and Mexico), OECD MSTI Database May 2005 (EU(15), Japan, United States), UNESCO Science and Technology Indicators March 2005 (China, India, Tunisia and South Africa).

117 Governments use a variety of tools to support R&D other than outright R&D expenditure. R&D tax concessions are, for instance, extensively used by OECD countries as an indirect way of encouraging business R&D expenditure. Special tax treatment for R&D expenditure can take various forms, including immediate write-offs of current R&D expenditures and various types of tax relief such as tax credits or allowances against taxable incomes. Tax subsidies for R&D have increased in 16 out of 24 OECD countries between 1995 and 2004 (OECD, 2005c). In 2004 the rate of tax subsidies was highest in Spain, followed by Mexico and Portugal. Japan ranked nine out of 24 with respect to the use of tax subsidies and the United States ranked 14. Unfortunately, the information available in the OECD database on R&D and innovation does not make it possible to compare the size of such budgetary losses through tax concessions with the size of direct government expenditure on R&D.

118 OECD (2005c).

Once governments have decided to support R&D, they face the difficult question of how to do so. In particular, they need to decide whether R&D support should have a rather general character or be focused instead. Should R&D be stimulated across the country or should it target regional clusters? Should R&D support be available for all economic activities or should certain sectors be privileged? Should support be directed towards private initiatives or public ones and should it rather target applied or fundamental research? All these questions have been discussed in the economic literature and for most of them there does not appear to be unanimity as to the appropriate answers. This lack of unanimity is to a large extent due to the lack of understanding of the mechanisms involved in knowledge spillovers.

There appears to be some agreement that location and proximity matter in exploiting knowledge spillovers. Jaffe (1989), for instance, found that knowledge spills over for third-party use from university research laboratories as well as industry R&D laboratories, and that the geographical distance between university and corporate research activities matters for the size of these spillovers. Other studies concur that knowledge spillovers tend to be geographically bounded within the region where new economic knowledge was created[119], although the precise relationship between distance and knowledge will only be known when it is fully understood how knowledge is passed. There are reasons to believe that knowledge spillovers are not homogenous across firms and that large firms are more adept at exploiting knowledge created in their own laboratories, while smaller counterparts have a comparative advantage at exploiting spillovers from university laboratories.[120]

The relevance of geographical distance for R&D spillovers has led to the use of the term "innovation clusters", the most famous example of such a cluster probably being the micro-electronics cluster in Silicon Valley. Other well-known clusters are the Emilia-Romagna region, where machine tools, ceramic tiles, knitting and footwear are dominant activities, and the German region of Baden-Württemberg that contains an important engineering cluster. In recent years, many governments have made a conscious effort to replicate such regional success stories.[121] So-called cluster policies have, for instance, been pursued in Wales (Technology Clubs), Spain (Basque country), Flanders (Flanders Language Valley), the Republic of Korea (Daegu), Brazil (Sinos Valley) and Malaysia (Multimedia Super Corridor – see Box 8).[122] Yet the advice with respect to cluster policy varies, with some arguing that governments should merely create an environment that facilitates the creation of clusters, whereas others suggest that governments should try to identify potential clusters and support their growth.[123] There seems to be some agreement, though, that clusters cannot be designed from scratch, but should be built instead on the basis of existing activities.[124]

A related question that is important for policy-makers is whether spillovers occur solely within an industry or not. There is no agreement in the literature about the need for both geographical and "economic" closeness between entities carrying out R&D in order for spillovers to take place. While certain contributions emphasise that clusters tend to specialize in relatively few products or technologies[125], others argue that diversity across complementary economic activities sharing a common science base is more conducive to innovation than is specialization.[126] The first scenario would represent an argument in favour of supporting the creation of industrial clusters and to target R&D support in both geographical and sectoral terms, as suggested in Rodríguez-Clare (2004). Proponents of such a strategy would thus argue in favour of R&D support for a rather narrowly defined group of recipients.

119 See Audretsch and Feldman (2004) for an overview of the relevant literature.

120 Acs et al. (1994).

121 See, for instance, OECD (2001a) for a discussion of the role of cluster policies for the nurturing of regional clusters.

122 Hospers and Beugelsdijk (2002).

123 See OECD (2001a), Rodríguez-Clare (2004).

124 Cortright and Mayer (2001), OECD (2001a), Rodríguez-Clare (2004).

125 Cortright and Mayer (2001).

126 See Audretsch and Feldman (2004) for a discussion of the relevant literature.

Box 8: Multimedia super corridor in Malaysia[1]

The Malaysian Government's Multimedia Super Corridor (MSC) was launched in 1996 as an initiative to support the development of the information and communication technology industry. Ten years later, the MSC hosts around 900 multinationals, foreign-owned and home-grown Malaysian companies focusing on multimedia communication products, solutions, services and research and development.

Companies settling in the MSC can take advantage of a broad range of facilities and financial and administrative incentives. These include:

- high quality infrastructure and infostructure supported by secure cyberlaws;
- unfettered employment of local and foreign knowledge workers;
- exemption from local ownership requirements;
- exemption from corporate income tax for five years (or an investment tax allowance);
- qualification for R&D grants;
- duty exemption on multimedia equipment imports.

Companies settling in the MSC are also assisted by the government-funded Multimedia Development Corporation (MDC) in a number of ways.

The MDC:

- ensures a rapid turnaround for applications for entering the MSC;
- assists companies in permit and licence approvals; and
- introduces companies to potential local partners and financiers.

[1] Information based on http://www.mdc.com.my accessed in January 2006.

Rodríguez-Clare (2004) proposes ways of identifying good candidates for such targeted R&D support, for instance on the basis of a sector's export performance. He therefore argues that governments do not need to "pick winners" but only need to recognize "revealed winners". Notwithstanding this difference, such focused policies carry the risk of targeting the wrong regions and sectors, which may result in very costly policy mistakes. Numerous economists therefore continue to have a preference for more general R&D policies that aim at raising the economy-wide level of research expertise.[127] Such policies avoid the need for governments to "pick" or "recognize" winners, are less prone to capture and dilute the strategic disincentive to undertake R&D with unappropriable spillovers.

Industries characterized by high fixed costs, due to necessary initial R&D investments or other investments, tend to be industries in which only a small number of producers are active. This is due to the fact that each producer needs to be able to produce at a rather large scale in order to recover the initial investment. In markets with few players, however, competitive pressure is relatively low and individual players are able to exert market power and shift rents from consumers into their own pockets. In such markets, therefore, governments may have an incentive to support national producers if this implies that rents will be shifted from foreign consumers to national producers and/or that less rents will be shifted from domestic consumers to foreign producers. Government intervention in such a context is often called "strategic trade policy" (see discussion in Section C). It often takes place in R&D-intensive industries under the pretext that "national champions" in certain industries need to be preserved. The semiconductor rivalry between the United States and Japan and the civil aircraft rivalry between Europe and the United States have often been cited as examples involving strategic trade policies (see Box 9).

127 See for instance Neary (2000), Pack and Saggi (2006) and Watson et al. (2003).

Box 9: Strategic trade policy : the semiconductor and the civil aircraft rivalries[1]

The semiconductor rivalry

Since the debut of the transistor in 1947, semiconductors have been at the heart of the electronics revolution. The many products and processes that have evolved alongside this industry span the high-technology "food chain", from equipment and materials upstream to computers downstream. Not surprisingly, policymakers have long identified success in the semiconductor industry as a necessary prerequisite for competing in high technology more generally, resulting in US-Japan "chip rivalry". In the context of this rivalry, the President of the US Semiconductor Industry Association urged Congress in 1990 not to abandon the industry in its trade dispute with Japan as "there was a difference between semiconductor chips and potato chips that mattered for the nation as a whole".

US Government spending on R&D has contributed to most developments in semiconductor technology. Through the 1960s, procurement by the National Aeronautics and Space Administration (NASA) and the Department of Defense accounted for most of the nation's semiconductor output (100 per cent until 1962). In more recent years, federally funded R&D has helped realize gains in the design and fabrication of successive generations of chips, for instance through its support of the Semiconductor Manufacturing Technology consortium.

The Japanese government, too, intervened significantly in the semiconductor market. Through the mid-1980s, tariffs and non-tariff barriers protected the Japanese market from imports of chips. This protection helped the domestic semiconductor industry to achieve the necessary production efficiencies to compete in export markets. Once trade was liberalized, state-funded R&D programs continued to assist the industry. For example, the Very Large Scale Integration (VLSI) projects underwritten by Nippon Telephone and Telegraph (NTT) and the Ministry of International Trade and Industry (MITI) sought to help Japan's consumer electronics giants cope with imports.

The Civil Aircraft Rivalry: some anecdotes

The civil aircraft rivalry between Boeing based in the United States and Airbus based in Europe has long been presented as the textbook case of strategic trade policy. The story is that in their search for rents in this imperfectly competitive industry, firms demand and governments supply export and R&D subsidies, hoping to win market share at the expense of foreign competitors. Indeed, it has been argued that governments on both sides of the Atlantic have invested greater resources fighting for civil aircraft than for most other high-technology industries.

On the United States side, the Export-Import Bank of the United States (EXIM) earned the nickname "Boeing's Bank", because 40 per cent of its portfolio was at one stage invested in the aerospace industry. Between 1967 and 1977, for example, EXIM loaned US$5.77 billion on sales of US$12.8 billion of US aircraft, and much of this in support of Boeing's exports.

In Europe it was allegedly Margaret Thatcher who pushed support for the launch of the A320 to the top of her agenda in talks with François Mitterand and Helmut Kohl in 1984. Mitterand's unwavering commitment to Airbus was representative of the three leaders, stating that "the A320 will be built, and I am its number one salesman".

The precise nature of support granted to Boeing and Airbus by the governments concerned, and the WTO legality of such support, are the subject of ongoing dispute settlement procedures in the WTO.

[1] Box based on chapters 3 and 4 in Busch (1999).

The argument in favour of strategic trade policy is more complex than may appear at first glance. Suppose the world market is large enough to support only one firm in an activity – a firm that would be making monopoly profits.[128] Each country's welfare with respect to this activity then consists in consumer benefits (technically, consumer surplus) with respect to the consumption of the relevant goods or services and the profits made by the firm if it is a national firm that serves the relevant market. Consumer surplus is maximized if production takes place where it is most efficient. But given that the relevant firm makes profits it may be interesting for each country to have a national producer serving the market. If the cost disadvantage of national producers is not too significant, it may be beneficial in terms of total welfare to accept a reduction in consumer surplus in order to secure the profits obtained in the relevant market. Consider now an early commitment by a domestic government to support the entry of a domestic firm into the industry by whatever subsidy is necessary. Models have shown that if the foreign firm finds this policy announcement to be credible, it may refrain from bearing the costs of entry, recognising that the market is not large enough to support both firms at a profitable scale.

The above story is a story of strategic entry promotion for a monopolist. It is possible to make arguments along similar lines in favour of strategic promotion in oligopolistic industries.[129] Whether such a policy is beneficial, and to whom, is difficult to determine a priori. Increased entry in oligopolistic industries may lead to increased competition and a reduction in prices, thus being beneficial for consumers. Third countries – that is, countries not producing and not subsidizing the relevant product – gain from strategic trade policies in such a case. It has, for instance, been estimated that the entry of Airbus in the market for commercial airliners on average reduced prices by 3.5 per cent.[130] Increased competition may, however, reduce the incentives to invest in further innovations in the relevant industries, which has a negative impact on consumers in both importing and exporting countries in the long-run. Government support for strategic reasons may also lead to excessive entry, resulting in increased consumer prices because producers cannot produce at a sufficiently large scale. Existing empirical evidence indicates that this may have occurred in the market for medium-range wide-bodied aircraft and the market for 30-40 seat commuter aircraft, where subsidies resulted in average costs of production that are higher than need be.[131]

Whether and to which extent producing countries gain from government intervention depends on the effect of the policy on domestic consumers, domestic producers and on the cost of the policy intervention. Economists tend to urge caution in the use of aggressive output, export or R&D subsidies for shifting profits to monopolistic or oligopolistic firms. If governments in two or more countries apply the same policy, profits are likely to be dissipated in excessive entry and the subsidizing countries will suffer in the end.

3. REDISTRIBUTION

This subsection begins with a discussion of why many societies place such importance on the distribution of income. A description then follows of the possible costs involved in transferring income from the rich to the poor and how different forms of subsidies compare in terms of effectiveness and costs in achieving a given level of redistribution. The subsection then goes on to consider specific examples of how governments use subsidies to achieve equity goals. Subsidies provided to water and telephony services have been chosen for this purpose. While it is typically low-income groups who are the targets of redistribution programmes, subsidies to achieve more balance in regional development will also be discussed. Finally, the use of subsidies to assist declining industries to adjust to economic difficulties will also be considered, although such interventions may also be justified on efficiency grounds. There will be some discussion of the trade impact of subsidies. An underlying theme in the discussion is the trade-off that must generally be made between equity and efficiency when redistribution polices are pursued. We shall also consider how it may be possible to reduce the associated costs of subsidies through better targeting or the incorporation of market discipline in their use.

128 See Ethier (1982) and Dixit and Kyle (1985) on strategic-entry promotion.

129 See for instance Brander and Spencer (1985).

130 Neven and Seabright (1995). The 1992 US-EU agreement on trade in civil aircraft which limits subsidies, instead, led to a price increase of about 3 per cent according to estimates by Irwin and Pavcnik (2001).

131 See the discussion in Grossman (1990).

(a) Why do societies redistribute income?

Why do societies find it necessary to redistribute income from the rich to the poor? In mainstream economic analysis based on the quest for efficiency, an inequitable distribution of income does not by itself represent a market failure. So long as the market ensures that goods are priced at marginal cost and factors of production are paid their marginal products, then the ensuing outcome is considered Pareto-efficient. One distribution of income is as good as another under a Pareto-efficient outcome. Hence, one needs to look beyond economic efficiency to understand why governments go to such lengths to achieve some balance in distribution. One finds a range of possible answers to the question, some of which rely on philosophical or moral explanations, others on political economy explanations, and still others on a mix of history, psychology and sociology.

It is possible to justify redistribution of income based on utilitarian theory.[132] A central principle of utilitarian theory is that an action conforms to the principle of utility "when the tendency it has to augment the happiness of the community is greater than any it has to diminish it".[133] Thus, if individuals experience declining marginal utility of income, then society's "happiness" can be increased by redistributing income from the rich to the poor, since on average the reduction in utility experienced by the rich is more than offset by the increase in the utility of the poor.

But even philosophers coming from a non-utilitarian tradition have provided reasons why societies need to be concerned with fairness in income distribution. In the *Theory of Justice*, Rawls (1971) argued that rational human beings, acting from an initial situation of ignorance about what their actual social station in life might be, would eventually arrive at a social contract that embodies two basic principles. One of those principles, the difference principle, would only allow social and economic inequalities if they lead to the betterment of the worst-off individuals in society.[134] Rawls allows for the possibility that some forms of income inequality can make the worst-off citizens better off if, for example, it acts as an incentive for the rich to innovate, the benefits of which would also flow to the poor. But except for these cases, the difference principle would strongly favour an equitable distribution of income and wealth, with a particularly high weight placed on the state of the economically worst-off. A just society will guarantee a social minimum (income) from which no citizen will fall below. This is to be guaranteed by "family allowances and special payments for sickness and employment, or more systematically by such devices as a graded income supplement (a so-called negative income tax)."[135]

Alternative explanations from public choice theory rely on the median voter (Meltzer and Richard, 1981).[136] In democracies, voters' approval determines the kinds of policies adopted by governments. According to the theory, policies which appeal the most to the median voter will be adopted since at least half of the voting populace will vote the same way he does. Consider a situation where voters decide on policies based on their income levels and where the issue at hand is income redistribution, let us say through transfers from those individuals whose incomes are above a certain threshold to those whose incomes fall below this threshold. The median voter would support redistribution policies if the threshold income is higher than the median income. Thus, redistribution would be adopted because it is in the economic interest of the majority of the voting population.

More complex explanations of the motives for redistribution rely on differences in *weltanschauung* among societies. Alesina and Angeletos (2005) construct a model where the interaction between social beliefs and welfare policy creates multiple equilibria. A society which believes that individual effort determines income will choose low taxes and have very little redistribution. In equilibrium, effort will be high and the role of luck will be limited, in which case market outcomes will be relatively fair and social beliefs will be self-fulfilled. A society which believes that luck, birth, connections, and corruption determine wealth will levy high taxes, thus distorting allocations and making these beliefs self-sustained as well.

132 In this tradition would fall Jeremy Bentham and John Stuart Mill.

133 Bentham (1789).

134 The first principle requires that rules defining basic liberties apply to everyone equally and that they allow the most extensive liberty compatible with a like liberty for all.

135 Rawls (1971), p. 243.

136 We also discuss public choice theory briefly in Section C when considering theoretical propositions underlying the use of subsidies and other policy interventions.

Bénabou and Tirole (2005) note how international surveys reveal wide differences in the views held in different countries concerning the causes of wealth or poverty and the extent to which people are responsible for their own fate. They then develop a theory of collective beliefs and motivated cognitions, including those concerning consumption, happiness and religion. Their model produces two equilibria. The "American" equilibrium is characterized by a high prevalence of just-world beliefs among the population and relatively laissez-faire policies. The "European" equilibrium is characterized by more pessimism about the role of effort in economic outcomes and a more extensive welfare state. Glaeser (2005) has reviewed the extensive literature on American "exceptionalism" – the fact that there is less redistribution in American society than in European society. He cites evidence that there is little difference in income or intergenerational mobility between the United States and Europe[137] and concludes that different beliefs about income mobility in the United States and the EU have little to do with reality.

But income redistribution is not costless to society. These costs arise because of adverse effects on incentives and the administrative costs of the transfer programmes. Perhaps one of the clearest articulations of the idea that there is some fundamental trade-off involved between equity and efficiency comes from Okun (1975). High marginal tax rates can reduce the incentive for saving, risk-taking and entrepreneurship. This is the excess burden associated with raising the taxes needed to finance the transfer. On the other hand, generous social programs can dull incentives to participate in the labour market and to work among recipients of the transfer. In addition, the rich may also be tempted to engage in socially wasteful activities to avoid taxes. Consequently, economic output and growth can suffer from too aggressive an effort to redistribute income. The process of redistribution can be described as a little like carrying money from the rich to the poor in a "leaky bucket". Although the bucket may be filled to the brim at the start, it will arrive to the recipient with less money than when it started out because of all the inefficiencies created by redistribution.

Another cost posed by redistribution programmes is that they can give rise to highly organized special interest groups who can turn redistribution policies in their favour because of their political influence. For example, Mulligan and Sala-i-Martin (2003) have noted how large social security programmes have become and how their growth rates cannot be accounted for by demographics. Given that the share of elderly benefits in GDP has grown more than the share of the elderly in total population, they argue that this is because the political power of the elderly has been growing over time. An additional cost that may arise from special interest groups is that governments may consciously choose inefficient forms of redistribution programmes so as to disguise transfers to these groups (Coate and Morris, 1995).

(b) Subsidies as an instrument of income redistribution

Whatever the underlying motives for redistribution, governments can achieve their redistributional goals through a host of instruments. The traditional instruments include a progressive income taxation system, social security and public health programmes. Although these may be the main instruments for redistribution, they are not the only ones used for such purposes. For surely part of the spending on public education, public housing, etc., could also be classified as social expenditures, i.e., they have the objective of improving economic opportunities or conditions for parts of the population. And outside these traditional areas of social expenditures, governments often justify subsidies to agriculture as necessary to support farm income.

While the focus of this subsection will be on the use of subsidies to achieve redistributional goals, it does not mean that they are superior to alternative policy instruments in being able to achieve a given transfer of resources to the poor at the least cost to taxpayers. Redistribution programmes that transfer purchasing power directly from the rich to those in need are the least inefficient. They increase the well-being of the poor more than an alternative scheme costing the same amount of money. Spending "x" euros on food subsidies for low-income households increases the welfare of recipients less than a cash gift of the same amount. This is because there may be other needs that the household perceives as equally or more important than food. With an income transfer, the household will have the flexibility of deciding how much of the additional "x" euros received should be spent on food and how much

[137] He cites papers by Gottschalk and Spolaore (2002) and Checchi et al. (1999) showing no major difference in income or intergenerational mobility between the US and Europe.

to be spent on other needs.[138] If redistribution in general is like using a "leaky bucket" to transfer money from the rich to the poor, subsidies involve the use of a bucket with a bigger hole at the bottom.

It is sometimes not easy to distinguish between income transfers and subsidies. In this part of the Report, income transfers will include anything which provides public funds directly to a beneficiary but leaves him free to decide how best to spend the largesse. Social security payments in the United States have this characteristic. Subsidy programmes, on the other hand, provide public funds to a beneficiary but in a form that can be spent only on certain types of goods or services. Public health programmes in many countries have this characteristic.

(c) Subsidies to utilities in developing countries

The demands for water, power and telecommunication services are some of the most basic needs. Consumption of these goods and services usually represent a sizeable chunk of poor households' budgets. Because many countries consider access to these services as a right, governments often adopt policies that severely under-price these basic goods and services. Two examples of subsidization to basic services are considered here – water supply and telecommunications.

(i) Water supply

In the case of water supply, assistance to the poor is often achieved through the water tariff structure. This takes the form of increasing block tariffs, which starts with a very low tariff for water consumption below a threshold level but then rises with higher consumption levels (Box 10). The lowest tier of the tariff structure is the price which is charged the poorest consumers. The higher tiers in the tariff structure reflect the charges paid by the large household consumers and the industrial users, who effectively (cross) subsidize poor households consumers.

But the water tariff structure is often set too low so that water utilities are not able to recover costs. A survey undertaken by McIntosh and Yniguez (1997) for the Asian Development Bank of 50 water utilities in the region showed that the average domestic tariff in Asian water utilities was about US$0.36 per cubic meter of water.[139] Fifteen of the 50 surveyed water utilities had average tariffs that did not generate sufficient revenues to cover their operating and maintenance costs. An even larger number of the utilities (29) did not generate sufficient revenues to be able to finance their capital costs. As a result, subsidies to water utilities in the Asian region takes the form of a contribution by central governments to capital investments that are either in the form of grants or soft loans (McIntosh, 2003).

But low tariffs lead to fundamental problems in providing water. If water is not correctly priced, it may be wasted. Low revenues make it difficult for the utility to maintain let alone upgrade facilities and to expand capacity, resulting in inadequate water supply. Water is only intermittently available to the poor and they may need to spend more to purchase water from informal providers. For example, only slightly more than half of the 50 water utilities included in the ADB survey provided 24 hour water service. Twenty-four hour water service ends up being a luxury rather than something that can be taken for granted.

In addition, the water subsidy may not even reach the poor and may be captured by richer households. In sub-Saharan Africa, many of the poorest households are not connected to the water network (WUP, 2003).[140] Rapid urbanization in the region has led to the mushrooming of informal settlements, which have no access to many forms of public infrastructure, including water. Thus low-income households may have to access water supply and sanitation services through a broad range of service delivery arrangements, intermediaries including

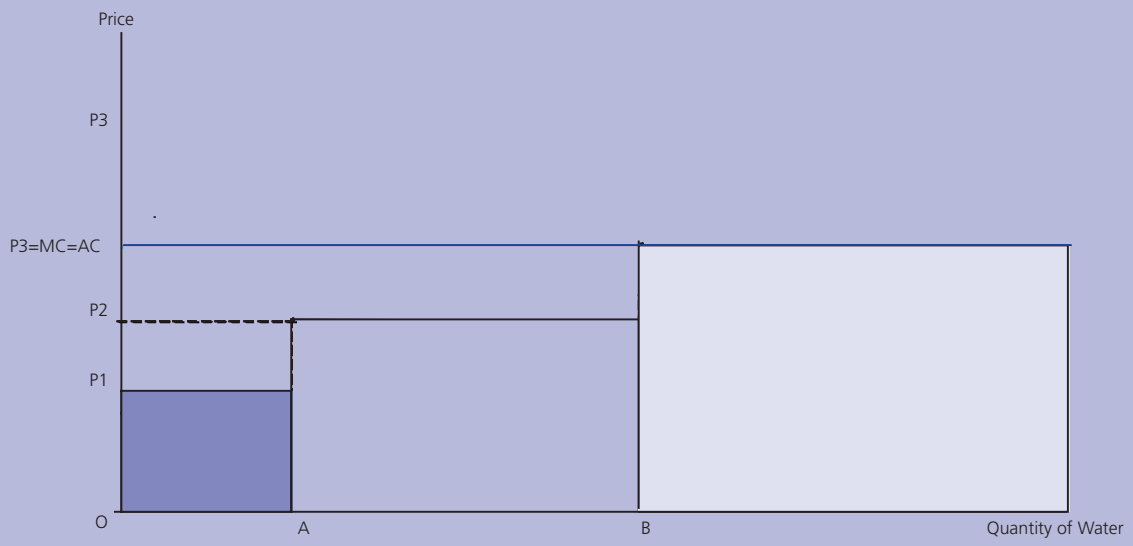
[138] Even in a second-best world where revenues need to be raised through distortionary taxes on goods, redistribution through subsidies is inferior to simple transfers. This follows from the need to preserve the usual first-order conditions of production efficiency even in this second-best setting, i.e. society must still be on the production possibility frontier (Diamond and Mirrlees, 1971).

[139] McIntosh and Yniguez (1997). But this average hides some significant intra-regional differences. For example, domestic tariff levels in a number of South Asian cities were as low as US$0.01 to US$0.03 per cubic meter. In contrast, tariffs in Hong Kong, China and Singapore were about US$0.55 per cubic meter.

[140] The Report is a comparative study of water and sanitation services in nine African countries.

community or private outlets, vendors who deliver door-to-door on a daily basis, wells and boreholes, apart from taps connected to the public water delivery system.

Box 10: Block water tariffs



Water tariffs are often multi-tiered. In this example, the lowest tier of the price structure (P1) is targeted at the poorest households, who are assumed to be low-volume consumers of water (average consumption of OA). The upper tiers of the structure are the prices charged to heavier users, who will normally be richer households (price of P2) or industrial users (price of P3).

In this example, the price charged to industrial users, and the marginal cost and average cost of water consumption are all identical and depicted by the horizontal line from the vertical axis. Rich and poor households pay prices that are less than marginal cost while industrial users provide «cross-subsidies» in the sense that they pay a higher price. The shortfall between total revenues and total costs is covered by the government with subsidies taken from the budget.

In this case, better targeting of the poor and economic efficiency would call for increasing the water tariffs charged to richer households, to the level of marginal cost. This would reduce the drain on the treasury and ensure that rich households make decisions on water consumption facing the true cost of the resource.

The irony of this situation is that because connection is costly for the poor urban household and because the quality of water service is often bad, they may end up paying a lot more for their water from private sources. Thus, the evidence suggests that the poor are often willing to pay a lot more just to ensure access to clean, safe and regular water. Thus proposals for reforming water utilities often begin with rationalizing the water tariff structure to more precisely target the poor and to correctly reflect the cost of water (see Box 10).

There is one other aspect relating to the subsidization of existing water utilities that needs to be mentioned. Subsidies are often part of a policy regime that puts water supply and sanitation firmly in the hands of the public sector, despite the financial burden on the treasury. In this sense, subsidization in the water sector and hostility to domestic and foreign private sector participation goes hand-in-hand. To that extent then, subsidies limit opportunities to trade, which would occur if foreign private water suppliers were allowed to provide their services.

There is evidence that private sector participation, whether domestic or foreign, can improve economic efficiency in the water sector. It should be noted, however, that not all experiences involving the supply of

water by the private sector have been successful, and this has fuelled public reservations about the desirability of leaving the supply of this essential service in the hands of private enterprises. A key question is whether efficient supply of water necessarily involves a sacrifice in equity. The evidence seems to be mixed. Private sector participation in water supply and sanitation in developing countries and transition economies is increasingly becoming more common. Clark et al. (2004) listed at least 27 such examples which have been the subject of careful case studies. Their paper analysed evidence bearing on the performance of private and public water utilities. It focused on the impact of private sector participation in three Latin American countries and concluded that access to water from public and private utilities has improved and that private participation has not negatively affected the poor. Other recent studies paint a more nuanced picture. Simpson (2006) concludes that liberalization of water services has produced a mixed record, with coverage rising at the same time as prices. Solanes (2006) analyses the effect of the liberalization of the Buenos Aires water system on access by the poor. His study suggests that while tariffs went up, there was no accompanying expansion in coverage so that a large part of the urban poor population continued not to have access to water supply.

(ii) Universal access in telecommunications

Most countries adopt universal access to telecommunications as a public policy goal. A major focus of universal access policy is low-income households and rural areas, which may not be adequately covered by private service providers. The demand for telecommunication services in these areas might be too low to support the cost of establishing the infrastructure to connect the population to the telecommunication network. If low-income households are unwilling or unable to pay the full cost of these services, subsidies might be used to defray part of the cost that will be incurred by service providers.[141]

Because of the high fixed costs and their network nature, telecommunication services have been traditionally considered natural monopolies. Whether these services are provided by a state or private monopoly, universal services obligations were primary financed through cross-subsidization. This implied that some users (high-income consumers in urban areas) paid prices above cost, while others (poor individuals in rural areas) paid prices below costs.

More recently, however, technological developments the telecommunications sector have led to increased privatization of state monopolies and the introduction of competition. In a competitive environment, firm level cross-subsidies are difficult to maintain, because whenever a class of users is charged below cost suppliers will have little incentive to serve these consumers. Many governments therefore have to rethink how to guarantee universal access. The challenge of universal access policy is to expand access to infrastructural utilities services in under-served areas, minimize the subsidy to be paid and yet ensure service operators' profitability and long-run sustainability.

Among the most common measures used to finance universal access in a competitive environment are direct transfers to users that the government wishes to help, regulatory measures whereby universal service obligations are included in the concessions and licences granted to operators, taxes on asymmetric interconnections favouring rural operators and universal access funds (see Table 4). As has been emphasized in this report, lump-sum transfers are the best instrument for assisting the poor from an efficiency perspective. However, in practice, especially in the case of developing countries, a tax and transfer system might not be efficient, because of tax evasion and inefficiency in tax collection.

141 See Section E for a discussion of the incidence of subsidies in the telecommunications sector.

Table 4
Main mechanisms to provide universal access

Measure	Selected Countries
Universal access obligation on incumbent	Mexico, South Africa, France, Japan, United Kingdom
Universal access obligation on new entrant	Uganda, India, Ghana, Philippines
Universal access fund A fund is established and used to finance the extension of telecommunication services to targeted regions or population. The fund is financed by a tax on the operators, general tax funds, privatization, or the sale of licenses.	1. Uganda, Peru, Ghana, United States 2. Nepal, Brazil (1-3 per cent of sector revenue) 3. El Salvador, Chile (general tax funds) 4. Guatemala (sale of resources: privatization, sale of licenses)
Public-private partnership (Build-Operate-Transfer) Private investors build the telecommunications network, operate it and receive a share of the revenues. After a specified period of time, the network is turned over to the government.	Indonesia, Thailand, Bolivarian Rep. of Venezuela, Kenya
Private-Civil Society Partnership Civil society groups, NGOs or cooperatives can take the lead in introducing telephone connectivity in rural areas. Financing can be raised from both private and the public sources.	Bangladesh, Uganda

Source: OECD (2004a) DCD/DAC/POVNET(2004)13 Annex 1.

Increasingly, some developing countries are resorting to universal service funds (USFs). All firms would be required to contribute to a universal service fund and they can all draw resources from it when they provide a service to the targeted population (poor) or area (rural sector). In this way, the mechanism can be devised in a neutral manner that does not advantage one firm relative to another. One interesting way to determine the size of the subsidies is through auctions, i.e. firms can competitively bid for subsidies. Chile and Peru were among the first to implement this mechanism to provide subsidies (see Box 11 for a discussion of the Chilean case). A licence would be given to the firm that agreed to serve a certain area for the smallest subsidy. It is often the case that the regulator is not as informed as operators about the cost of providing a service to remote areas. Then, competitive auctions can be an effective way to determine the true cost of providing the service. Interestingly, in many cases the winning bid is for a subsidy that is below the maximum subsidy offered by government in exchange for the license. This might suggest that the subsidy previously granted to the monopoly to comply with the universal service obligations were above the real cost of service provision (Cannock, 2001). These models show how governments can harness the forces of competition, through the auction, in order to achieve their equity objective at a lower cost.

In most circumstances, the use of subsidies to assist domestic telecommunications firms is likely to impede access by foreign providers. But the effect may be mitigated if the subsidy is to be auctioned off competitively and foreign service providers are not ruled out from the auction. All providers, whether domestic or foreign, would be eligible for the subsidy *ex-ante* although *ex-post* there would only be one winner.

Box 11: Universal Services Funds in telecommunication services: the case of Chile

Chile is often seen as a successful model of how to combine the use of public money (subsidies) with the discipline of the market place to achieve universal access in telecommunication services.

In Chile, the move toward privatizing the telecommunications industry began in the late 1980s. This led to a more than doubling in the telephone penetration rate, from about 49 per 1,000 population in 1988 to 113 per 1,000 population in 1994. But the explosive growth still left out significant pockets of the population, mainly those in the rural areas which represented about 15 per cent of the population and pockets of the urban poor. To address this equity concern, the government established a Telecommunications Development Fund (*Fondo de Desarrollo de las Telecomunicaciones*) in 1994 to encourage additional private investment in payphone service in rural areas and urban areas with low telephone density.

The project cycle begins with the receipt of requests for payphones from regional and local authorities, neighbourhood associations, telecommunications companies, and the general public. The telecommunications regulator then groups these requests into projects, according to geographical proximity and technical characteristics. Cost-benefit analyses are then carried out on these projects to determine which could be eligible for subsidies under the fund. The maximum subsidy to be offered for a project is the amount estimated to make it commercially viable.

Potential telephone operators are then asked to bid for the projects and the subsidies that go along with them. The winning firm is whoever submits the lowest estimate of the subsidies that would be required to make the project financially viable. Bidding companies must be willing to provide payphones to the public 24 hours a day for at least 10 years. They are free to provide any other services and to determine the prices of those services. However, regulators establish a maximum fee for regional payphone charges.

Between 1995 and 2000 the fund was able to support the provision of payphone services to more than 6,000 rural localities with about 2.2 million inhabitants. During this period, about US$52 million was spent to install payphones, for which the fund provided subsidies of US$22 million. However, the companies also invested another US$109 million for additional services, so every dollar of public money was able to mobilize an addition six dollars of private investment.

However, some questions remain about whether the services can be sustained in the long term. The financial performance of the operating companies has been mixed, with some making small operating profits while others are not expected to break even. So there is real concern that at the end of the 10 year obligatory service, some of the companies might not continue operations.

Source: Wellenius, B. (2002) 'Closing the Gap in Access to Rural Communications: Chile 1995-2002' *World Bank Discussion Paper* No. 430.

(d) Regional development

Many governments are often concerned not only with the distribution of personal or household income, but also with regional disparities in income and employment. The "new economics of geography" (Fujita et al., 2001) suggests that regional differences in industrial structure and in income arise naturally from the interplay of certain economic forces, notably increasing returns to scale internal to the firm and transport costs. It is the tension between these two forces which leads to the simultaneous existence of geographic concentration of industry with dispersion. A key feature of agglomeration is that it is a process which feeds on itself, so that once started, it tends to reinforce the initial clustering effect.

It is easy to see how differences in the geographic concentration of economic activities can then lead to regional differences in income or development. Manufacturing and high technology industries, which tend to be associated with higher average wages and incomes, may become concentrated in certain (urban) regions of a country while agriculture remains in the periphery. Industries may also go through their own life cycles, with periods of strength and decline. Thus, regions that house sunset industries may suffer a process of economic decline and a loss of population.

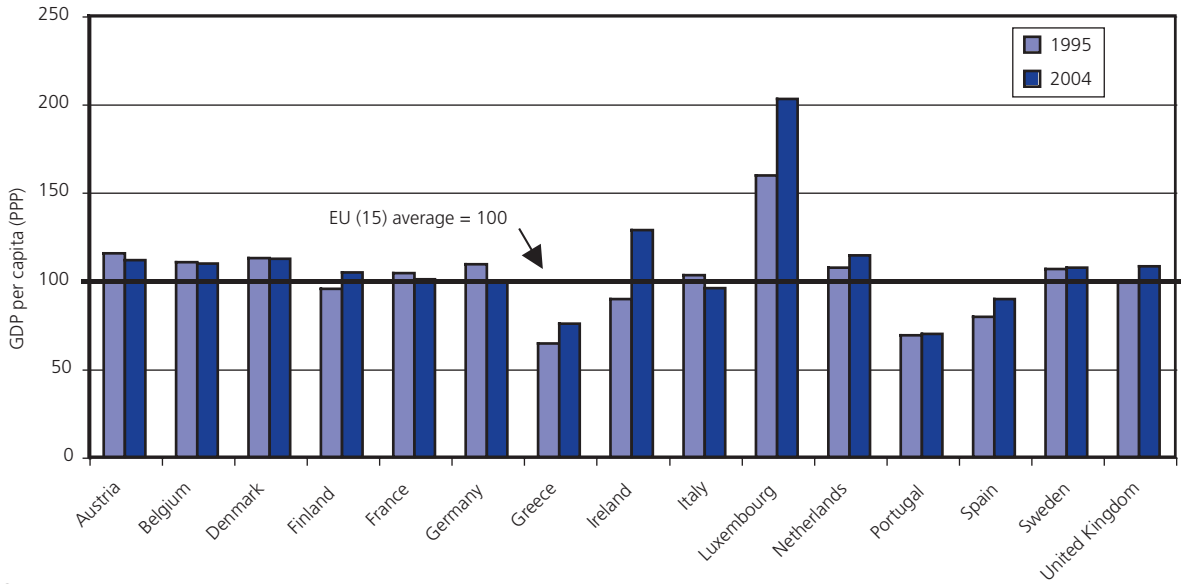
These differences in levels of development and economic activity across regions do not necessarily suggest that there is a failure of the market system. But political and social frictions are likely to arise if there is too big a gap in income or economic opportunities between regions of a country – between rural and urban areas, between the hinterland and coastal regions, etc. The costs of regional disparities could be more pronounced if these regions also differed in some other important ways, such as in religion, ethnicity or political allegiance.

Even in its beginnings, the European Steel and Coal Community placed a large emphasis on equitable regional development. This may have reflected the belief that the level of cohesion of the organization, and the degree of integration that could be achieved, would be markedly lower if the benefits from the establishment of the Community did not flow more equitably to the Members and to economically-lagging regions. In the Preamble to the Treaty of Rome, the founders of the European Community referred to the need "to ensure their harmonious development by reducing the differences existing between the various regions and the backwardness of the less favoured regions". The objective of current EU regional development policy is "to help lagging regions to catch up, restructure declining industrial regions, diversify the economies of rural areas with declining agriculture and revitalise declining neighbourhoods in the cities."[142]

But the pursuit of regional development is not cheap. The EU allocates more than a third of its budget for the purpose of regional development. The main financing facilities for regional development are the structural funds. For the funding cycle 2000-06, a total of US$235.1 billion (in 1999 prices) have been made available. Ninety-four percent of the structural funds are to be used to achieve three objectives. The first objective (Objective 1) is to assist regions whose development is lagging behind to catch up. The Objective 1 regions are those geographical areas with a per capita gross domestic product lower than 75 per cent of the European Community average. The second objective (Objective 2) is to support economic and social conversion in industrial, rural, urban or fisheries dependent areas facing structural difficulties. Finally, the third objective (Objective 3) is to modernise systems of training and to promote employment. There was also an additional €22 billion in pre-accession aid; and another €22 billion in structural interventions for the new Member States will be spent in the period 2004–06.[143]

Some idea of the economic diversity of the 15 members of the EU and of whether some convergence has taken place can be seen in Chart 1 below. Chart 1 shows GDP per capita on a purchasing power parity basis (indexed at 100 for the EU 15 average) for the members first in 1995 and then in 2004. In 1995, six of the members had GDP per capita in PPP terms that were below the EU 15 average. These were Finland, Greece, Ireland, Portugal, Spain and the United Kingdom. Between 1995 and 2004, five of the six increased their GDP per capita, some quite dramatically. The GDP per capita of Ireland, Greece and Spain grew by 43.5 per cent, 17.5 per cent and 12.8 per cent respectively. By 2004, the GDP per capita of Finland, Ireland and the United Kingdom were above the EU 15 average. Only Portugal showed no major improvement.

Chart 1
GDP per capita (PPP) of European Union (15) Members, 1995 and 2004



Source: Eurostat.

142 http://europa.eu.int/comm/regional_policy/intro/working1_en.htm.

143 http://europa.eu.int/comm/regional_policy/intro/working4_en.htm.

If one takes the broadest possible view of economic convergence, that is movement of GDP per capita on a PPP basis towards the EU average, there has certainly been movement towards that direction over the past ten years. Catching up has been particularly dramatic for a number of the poorer EU Member States. But it is not clear to what extent these improvements represent the working of the EU's regional policy, what can be attributed to the single market and to monetary union, and what can be explained by national economic policies.

Outside contractors who have evaluated the EU's regional programme during the previous funding cycle (1994-2000) in attaining Objective 1, reach broadly similar conclusions (ECOTEC, 2003) – namely that the structural funds have had a positive impact on the GDP of the Objective 1 regions and their overall performance relative to the EU as a whole has improved. But the report also stated that while Objective 1 is a significant contributor to the improved performance of those regions, it has probably been secondary to other factors in many cases. The extent of the beneficial impact is heavily dependent on both institutional capacities and factors such as the structure and openness of the economy.

(e) Adjustment

Governments sometimes justify subsidies to declining industries with income distribution arguments. For instance, as discussed in Section E below, financial aid granted by Members of the EU to their coal industries is considered compatible with the proper functioning of the common market if it helps in solving the social and regional problems created by total or partial reductions in the activity of production units. Note that this is not the only objective that would make coal subsidies acceptable to the EU. They would also be acceptable if they help achieve further progress towards economic viability with the aim of achieving a reduction of aid, if they help the coal industry adjust to environmental protection standards, or if they are part of an effort to strengthen the EU's energy security. While these other objectives are discussed in other parts of this Section, this subsection focuses on the income distribution argument.[144]

The productive structure of countries, that is the relative size of various sectors and industries in total production, evolves with changes in countries' relative competitiveness and the capacity for product and technology innovation. While new industries are created and expand, others decline and eventually disappear. As part of this process of industrial transformation, resources are reallocated from declining to expanding industries. Workers leaving a shrinking industry to find a new job in a growing industry may face two types of costs: a short-term adjustment cost and possibly a longer-term reduction in wage, if the new job pays less than the old one.

The short-term and long-term effects of industrial transformation raise different issues for policymakers. The size of the transitional adjustment costs is related to the speed and efficiency of the adjustment process. Government intervention designed to reduce adjustment costs would thus take place primarily for efficiency reasons. In contrast, the longer-term changes in wages reflect changes in the distribution of income among different groups of workers. If there is a risk of a permanent increase in inequality within the country, policy makers may consider intervening for equity reasons. As discussed in Bacchetta and Jansen (2003), the nature of the required government intervention is very different in these two cases.

There are two main cases where governments may subsidize firms with the objective of facilitating adjustment for workers. First, governments may provide credit assistance to ailing firms with the idea that if they manage to improve their competitiveness, adjustment by workers could be avoided. Because credit markets do not always function efficiently, firms may face credit constraints and not be able to obtain the funding necessary for adjustment-related investments, even though they would be able to pay back the loans. This argument, however, raises issues similar to those discussed in relation to selective industrial development policies.

Second, in cases of severe and unexpected shocks affecting the competitiveness of an industry, the question arises whether governments should intervene to slow down the adjustment process. In general, workers will choose the

[144] As far as the industrial restructuring aspect is concerned, a government intervention would be justified in the presence of some market failure. A subsidy, in turn, would be justified only if it is the instrument that addresses the market failure most directly. Note, however, that the market failures examined in relation to infant-industry promotion are unlikely to be present in the case of declining industries.

optimal rate at which to adjust.[145] However, government intervention may be warranted for political reasons or in the presence of certain market distortions. Governments may choose to temporarily subsidize an industry if they expect individuals to underestimate adjustment costs. This may be the case if the shrinking industry is a major regional or national employer. Shrinkage of the industry would imply a large number of workers being released from their current job, which may have serious negative repercussions on regional or national private sector activity in general. Those repercussions represent externalities which, if not taken into account, may result in excessive layoffs.

Governments may also subsidize workers more directly. Credit constraints, for instance, affect both firms and individuals. An unemployed person who cannot rely on his or her own savings may have to borrow money in order to cover current expenses or to invest in training. Because such loans are notoriously difficult to obtain, many industrialized countries have set up social safety nets. Governments may also subsidize training directly. In some industrialized countries, it is compulsory to participate in certain training courses in order to receive unemployment benefits. Such courses often aim at assisting workers in the search process directly, for instance by teaching them how to apply for a vacancy and how to conduct a job interview. Training may also aim at providing unemployed workers with skills that are in high demand. Note, however, that available evidence on the effects of retraining programs on unemployment duration and wage levels is mixed.

4. ENVIRONMENTAL PROTECTION

Environmentalists have long been concerned with the environmental consequences of growth on the environment. However, it is only since the end of the 1960s that the issue of sustainability of economic growth has received attention in the political debate and sensitivity to environmental quality has been deemed necessary for sustainable economic growth in the long run.

The increased attention of government policies toward environmental problems over the last 40 years has been triggered by the evidence of significant environmental degradation (including deforestation, global warming, reduced bio-diversity, air pollution, depletion of the ozone layer, over-fishing, energy resource scarcity) accompanying the exceptional economic growth over the same period. For example, pushed by development needs, global energy consumption has increased by about 70 per cent since 1970. As a consequence, greenhouse gas emissions have increased, leading to an increased risk of climate change and global warming. Industrialized countries are responsible for the majority of historical and current emissions, although OECD countries' share of CO_2 emissions has decreased by around 11 per cent since 1973. This does not remove the risks, as it has been estimated that developing countries may contribute up to 50 per cent of emissions by 2035. As an additional example, between 1960 and 1990, some 20 per cent of all tropical forests in the world were lost. Since 1990, tropical forests continue to recede by an average rate of close to 1 per cent a year. Globally, 94 million hectares of forest area were lost between 1990 and 2000. A leading cause of deforestation is land conversion to agricultural uses. Other reasons include overgrazing, logging, fuel wood gathering, urban growth and road construction.[146]

Widespread agreement exists in the international community that economic incentives which influence the behaviour of producers and consumers must meet sustainable development objectives, defined as "development that meets the needs of the present without compromising the ability of future generations to meet their needs". However, there is still divergence among governments and commentators as to what are the best policy practices to achieve sustainable development.

Parallel to the increased attention to environmental issues, there appears to have been an increase in the use of subsidies for environmental protection. Environment–related subsidy notifications under the Agreement on Agriculture have increased from an average of 23 notifications annually in the period 1997-1999 to a yearly average of 37 in the period 2000-2002 (WTO, 2005b). Similarly, EU state aid for environmental and energy-saving objectives have been increasing over time. They amounted to €8.5 billion in 2003, more than a doubling relative to the 1999 level. The share of environmental subsidies in the EU rose from 13 per cent (average 1999-2001) to 23 per

145 See Mussa (1986).

146 See UNEP, Global Environmental Output at http://www.unep.org/geo/yearbook/yb2004/

cent of total state aid in 2003. However, the incidence of environmental subsidies varies greatly across countries. Within the EU, Denmark, Finland and Sweden devote the largest share of their state aid to the environment and energy saving. In 2003, the figure for Sweden was 75 per cent (European Commission, 2005a).[147]

In order to understand the debate around sustainable development and optimal government intervention, it is important to understand the causes of environmental degradation. These can be pinned down to various causes of market failures and government policy failures. Market failure comes about when property rights are not well defined. There are different sources of market failures for environmental and natural resources.

One source of market failure is negative environmental externalities.[148] These can be consumption or production externalities. There is a negative externality any time a producer or a consumer does not have to bear the full cost of his actions, so that he over-invests in the polluting activity or over-consumes relative to the socially optimal level. For example, a company whose production causes air pollution through gas emissions, but is not made to pay for this, will continue to produce as long as the incremental revenue the firm will earn from selling its product exceeds its incremental cost of production. The firm's decision to produce will not take into account the cost caused to society by the pollution. As a consequence, the firm will produce more than is socially optimal and will over-damage the quality of air. An example of a negative consumption externality is the noise pollution of people playing loud music in a park.

There are other circumstances when the activity of a firm or a consumer may have positive environmental externality effects. The cause of a positive externality is the impossibility of fully appropriating the social benefits deriving from certain actions that are not taken into account by the individual agent, thus leading to under-investment or under-consumption. An example is a firm's research activity directed toward the development of solar energy technologies. When deciding how much to invest in research and development, a firm will compare the private benefits of producing solar energy with the cost of research. Since the firm cannot appropriate the social benefits, it will not take into account the environmental benefit to society of developing a new technology. As a result, the firm will under-invest in this type of research.

Another source of market failure relates to the public-good nature of environmental resources. A public good is pure when it satisfies two conditions – non-excludability (nobody can be excluded from its provision) and non-rivalry in consumption (one person's consumption does not reduce its availability to anyone else). A public good is impure when it is either non-excludable or non-rival in consumption. In environmental economics examples of public goods are the ozone layer, climate change, and biodiversity. Common property goods (like rivers, lakes, some parks) are impure public goods because people can be excluded from benefiting from them. Other natural resources are impure public goods because they do not satisfy the non-rivalry condition. An example is the fish stock, as each unit of fish caught diminishes the amount available to others.

The potential problem with using the market to provide public goods is free riding. That is, since nobody can be excluded, everyone has the incentive to let someone else provide the good. As a result, the public good will be under-provided. In the case of the commons (impure public goods), since one person's use of a good reduces the total available to all, everyone has the incentive to capture the benefits as quickly as possible before someone else gets them. If anyone, without restrictions, can fish from the sea, collect wood from the forests or chase wild animals, the likely result is the over-exploitation of these resources. This phenomenon is known as the "tragedy of the commons".[149]

147 See Section B for the definition of "state aid".

148 See Section C.

149 The tragedy of the commons can be seen as a collective prisoner's dilemma (Hardin, 1968). Individuals within a group have two options: cooperate with the group or defect from the group. Cooperation happens when individuals agree to protect a common resource to avoid the tragedy. By cooperating, every individual agrees not to seek more than his share. Defection happens when an individual decides to use more than his share of a public resource. Game theory shows that individuals benefit from defecting in the prisoner's dilemma (even though both would be better off if both cooperated than if both defected), unless there is some individual cost to defecting. In the iterated prisoner's dilemma, retaliation for past defection can make cooperation the best choice even for a selfish individual. Similarly, far-sighted groups that impose some sort of sanction on members that over-exploit a resource can make over-exploitation unprofitable. This is trickier for larger groups.

Finally, a market failure can occur because of the asymmetry in information available to the consumer and the producer about the quality of a good or of the environmental standards adopted in its production process. The problem is that of adverse selection against the provision of goods of better environmental quality. Products of higher environmental quality are more costly to produce and so must be sold at a higher market price. If producers cannot signal this to consumers, the latter will have an incentive to buy the cheaper good of poorer environmental quality.

A government has available a range of policy instruments to address these market failures. These are command-and-control instruments that take the form of rules and regulations prohibiting, limiting or requiring certain types of actions; economic incentives, including tradable permits, tariffs, taxes, and subsidies designed to create appropriate patterns of incentives for private behaviour; and informative instruments, such as campaigns and education policies. The effectiveness and the desirability of these different policies will depend on the source of market failure and specific circumstances.

Let us consider, for explanatory purposes, the case when a country wants to reduce air pollution by reducing the CO_2 emissions of domestic firms. The country may reduce CO_2 emissions via a range of policies, including by imposing a regulation that obliges firms to reduce emissions to the desired level, by introducing tradable permit schemes, taxing emissions directly, taxing production, providing a subsidy for each unit of emission reduction or for reducing capacity, and by conducting an information campaign targeted to increase environmental consciousness in the markets. What elements determine the best policy?

Economic theory suggests that the first-best policy is always to address directly the source of the problem, otherwise we impose unnecessary costs on society. A first-best policy in this case would be to introduce a tradable permit scheme. Under this approach, the government sets the limits of the maximum allowable amount of emissions. It then allocates this maximum amount among the sources of pollution by issuing permits that authorize industrial plants, say, to emit a stipulated amount of pollutant over a specified period of time. After their initial distribution, permits can be exchanged in the market and other polluters or victims of the pollution can buy them. Producers with a deficit of permits or with plans to expand their activity must reduce emissions from existing plants. Alternatively, they may purchase permits from other producers who are either able to reduce emissions at a lower cost or that find it more profitable to sell their permits rather than using them. Thus, the desired reduction of emissions is attained at the minimum possible cost to the society and a strong incentive is provided to improve efficiency and develop cleaner technologies. This system introduces something similar to a property-right regime, thus addressing directly the market failure. If the market is perfectly competitive and there are no transaction costs, then the system leads to a first-best outcome independently of who gets the permits initially (Coase, 1960). In practice, the problem with this policy instrument is that markets are not perfect, and tradable permits can also be used for strategic competition purposes.

Theory also suggests that emission standards are less efficient than emission charges. Emission taxes are an optimal instrument for environmental protection because the government can set the charge at the marginal environmental damage corresponding to the socially optimal level of pollution (this tax is known as the Pigouvian tax) and then firms will abate at the point where their marginal abatement cost equals the charge. In contrast, emission standards can be economically inefficient and excessively costly to implement. For example, under the regulatory approach, all producers would be subject to the same emission standards regardless of their pollution abatement costs. Ideally, only large scale producers would need to adopt pollution control technologies, as their cost per unit of output is lower than that of small-scale production firms. Although, theoretically, the Pigouvian tax represents an optimal policy instrument, in practice its implementation raises a number of concerns. These include distributional issues, uncertainty about the cost and the benefits of abatement and the cost of monitoring and enforcement. For these and other reasons, policy makers may prefer the use of environmental standards.

In addition, while emission taxes are an optimal policy, taxing production (rather than emissions) would be a second-best policy since production is not a problem per se. The problem is the emissions generated by the production process through, for example, the use of polluting inputs.

Economists tend to consider, from a theoretical point of view, taxes and subsidies[150] as similar instruments, for a subsidy can be thought of as a negative tax. For example, a tax on gas emissions or a subsidy for each unit of emission reduction can be designed in a way to have equivalent effects on one firm's emissions. To the extent that they are both targeted to the emissions, they are a first-best policy.

In general, it may be argued that a tax may be superior over time. This is because a tax deters entry and the expansion of the environmentally damaging activity, while a subsidy per unit of emission reduction may provide the incentive for firms to enter the market. If marginal abatement costs differ, some firms will be compensated for their actual abatement cost, but others will make a profit from the subsidy and this will encourage entry. In this case, even if each firm pollutes less, total pollution may not decrease as there will be more firms that pollute. Another advantage of an environmental tax policy is that it is consistent with the "polluter pays" principle, which argues that the public owns environmental resources and those who damage these resources should pay the public.

As far as information campaigns are concerned, they are an optimal intervention policy to the extent that the source of the problem of excessive emission levels is the asymmetry of information between consumers and producers on one side and the government on the other about the risks of environmental degradation, or the asymmetry of information between producers and consumers about the environmental characteristics of a product or its production process. An information campaign may serve the purpose of increasing the number of environmentally-conscious consumers and producers, which may act as a deterrent for firms against environmentally-damaging behaviour even in the absence of regulations. This may occur in two ways. First, additional information may provide firms with the incentive voluntarily to adopt more environmentally-friendly standards to be able to capture the higher demand for environmentally preferable products (which may be made distinguishable to consumers through eco-labels). Second, firms may find it convenient to adopt environmentally less-damaging processes or produce goods more compatible with environment conservation objectives in order to safeguard their reputation and avoid consumer boycotts. However, the effectiveness of this policy is likely to depend on the socio-economic structure of the country where it is implemented. Empirical evidence suggests that the level of education of the population is a crucial factor in determining pressure on industries to behave in an environmentally-responsible way (Hartman et al., 1997).

A complementary policy in this context can be represented by subsidies provided to the distribution sector to foster the use of eco-labels.[151] The economic justification for this subsidy is the market failure produced by the asymmetry of information between producers and consumers about the environmental damage of the various production processes adopted by different industries. Without an eco-label, consumers will not be able to distinguish between the good that is produced merely in conformity with the prevailing environment standard and the firm that adopts a better (but more costly) environment standard. Without the label the latter producer might not be able to compete in the market, as it will need to charge a higher price.[152]

So far, the analysis has focused on *ex ante* policy instruments available to a government to protect the environment. There are, however, also *ex post* policies or enforcement incentives. These policies, although implemented after the environmental damage has occurred, may work as a pollution deterrent. Indeed, if firms are made liable to repay the environmental damage once it has occurred, they will take every action to reduce the probability of the damage occurring and will abate at the efficient point. But environmental liability may not work, for example, if firms have limited financial liability.

Government intervention to protect the environment may not always lead to efficiency. Firstly, the removal of the cause of market failure in one sector does not necessarily result in more efficient allocation if other sectors of the economy are characterised by market failures. A second consideration is that government intervention may itself induce economic inefficiency. For example, poorly designed tax and subsidy schemes may distort the allocation of resources in an undesirable way.

150 We restrict the analysis to environmentally-motivated subsidies that are intended to improve the environment. Subsidies may also be environmentally harmful. A number of recent studies have focused on environmentally harmful subsidies. See, for example OECD (2005d and 2002).

151 For the use of regulations to solve problems of asymmetry of information, see WTO (2005c).

152 See Valentini (2005).

A general issue relating to the desirability of different policies to achieve environmental objectives is linked to the issue of a possible government failure. In practice, it is very difficult to define the exact amount of an emission tax or a subsidy per unit of emission reduction to achieve a certain environmental objective.[153] In order to calculate the Pigouvian tax, a policy maker needs to know the value of the environmental cost and benefits of abatement, and the abatement costs of firms. Since there is a great deal of uncertainty about the exact magnitude of these costs and benefits, the government may fail to set the appropriate value of the tax, thus missing the environmental target.[154]

The advantage of regulation over other instruments to reduce CO_2 emissions is that it may be designed to precisely achieve a target. Yet, the cost of the policy is uncertain in this case. Since a tradable permit combines certainty of outcome and least costs, the argument is made as to the superiority of this instrument.

An important issue related to the use of certain environment standards is that of the optimal level of environmental protection. For a certain country, this will depend on its level of development. To the extent that imposing a strict environmental standard may turn out to be costly, international competition may trigger a race-to-the-bottom[155], thus undermining the possibility of protecting the environment through regulation in a free trade environment.[156] An argument can be made, in this context, to justify subsidies to help firms to adjust to new regulations and avoid pressures toward a gradual slipping of environmental regulations. These subsidies are intended to help producers to adapt to the new regulations, insulating them from the full cost impact of new products, processes or production method requirements. However, the risk exists that this type of support may result in a perverse incentive to make regulation more stringent than necessary to keep competition out.

Another source of government failure to achieve environmental protection is the trans-national nature of some environmental problems. Air pollution and acid rain, for example, transcend national borders. These types of environmental externalities are not local in nature, but global. It may be the case that the government of one country does not have the necessary inclination to reduce these trans-boundary emissions. The question then arises of what other countries can do to combat these emissions. One solution is for the downwind country to pay for the abatement costs of upwind countries. This may prove to be an optimal policy, especially if abating emissions abroad is more efficient that abating emission at home. Yet this policy may be subject to mounting pressure from public opinion to use harsher solutions against the polluting country. Another approach is to negotiate an international agreement.[157] Finally, trade barriers against the upwind country can be raised in the hope of dissuading it from continuing to pollute. However, these measures may prove to be effective as a means to force upwind producers to install abatement equipment only if the downwind country absorbs a large share of the production of the upwind firm.[158]

An important issue is whether environmental subsidies should be cross-sectional or targeted to a specific sector. To the extent that the environmental problem is sector-specific, there is an economic argument for targeting the subsidy to that sector. For this reason, environmental subsidies are more likely to be found in sectors that are relatively more polluting (such as energy and transport) or natural resource intensive (such as fisheries or forestry).[159] In addition, the type of subsidies – production-enhancing or reducing, for example – is likely to depend on the particular type of externalities of the sector.

153 A similar argument also holds for the use of an information campaign to achieve environmental protection objectives: it is difficult to estimate to what extent a certain campaign may affect individual decisions.

154 Many environmental resources exist as a stock – from an economic perspective an asset yielding flows of environmental services over time. In considering the efficiency and optimality of their use we must take into account the pattern of use over time. That is, efficiency and optimality have an inter-temporal or dynamic dimension as well as a static one. Imperfect information and uncertainty become particularly important in these circumstances, especially when actions have irreversible effects.

155 See Swire (1996) and Wilson (1996) for a survey.

156 For a discussion on standards and environmental protection see WTO (2005c).

157 See UNEP (2004).

158 Nordström and Vaughan (1999).

159 As a way of confirmation, figures for environmentally-motivated subsidies based on national statistics data for Sweden and Denmark show that the highest share of environmental subsidies are related to the transport sector. Natural resource-related environmentally-motivated subsidies (including agriculture, forestry and the fishery) represent nearly 5 per cent of Sweden total subsidies (Larsson, 2003).

Table 5 provides some examples of subsidies whose stated objective is to improve the environment.[160] Environmental subsidies have been classified into four groups, depending on the specific market failure they target: the first type of subsidy (Type 1) includes subsidies provided to eliminate or reduce an external cost generated by the activity of a firm, such as a subsidy provided as an incentive to reduce emissions, energy efficiency measures, conservation of nature and so on. Type 2 subsidies are subsidies designed to capture an external benefit generated by the activity of a firm. These include subsidies such as support for forestation, bio-energy research, the introduction of new environmentally friendly technology, and so on. The third group (Type 3) of environmental subsidy includes subsidies related to the costs of compliance with environmental regulation. Often such support relates to the purchase of new equipment, characterized by better environmental standards. Other types of environmental subsidies, Type 4, are subsidies provided to enhance consumer information about the environmental benefits of consuming some goods rather than others. An example is Denmark's support to the distribution sector to foster the use of eco-labeling.

Table 5
Stated objectives for a sample of environmentally-motivated subsidies

WTO member	Beneficiary	Stated Objective	Type of subsidy
European Communities	Agriculture and forestry	Agro-environmental measures and afforestation of agricultural land (among others)	1 and 2
	Coal	To help the coal industry adjust to environmental protection standards (among others)	3
Denmark	Transport	To promote the use of hydrogen in the energy sector, primarily in transport	1
	Rail transport	To secure a more environmentally sustainable freight transport	1
	Agriculture	To facilitate the transition to and improve the conditions for organic farming	2
	Forestry and wood working industry	.. with the view to obtaining satisfactory utilisation of natural resource wood, which is an environmentally friendly raw material	1 and 2
	Energy	To support international endeavours to reduce emissions of carbon and sulphur and to conform nationally and internationally to agreed environmental targets	1 and 3
	Distribution services	To promote the energy label	4
	All companies	To ensure better energy efficiency or energy savings in private companies to reduce CO_2 emissions	1
Sweden	R&D (universities, institutes of technology, firms)	To establish fundamental competence and expertise, to facilitate the transformation of the Swedish energy system in order to reduce the environmental and climatic effects of energy systems	2
	R&D (transport, communication, energy)	To provide aid primarily for R&D but also for environmental aid and support for energy saving	2
	Firms	To obtain higher levels of environmental protection compared with what is demanded by international standards	3
	Energy (wind power)	To ensure viability for producers of wind energy	2
	All enterprises	To reduce emissions of CO_2	1
	Fishery	To enhance stocks of eel and salmons for the commercial fisheries in coastal and inland waters	2
Korea, Republic of	R&D	To obtain internationally-competitive environmental technology, to promote environment industry and to provide financial support to research institutes ... dedicated to R&D on environmental technology	2
Thailand	All industry	To favour ... investments for energy and environmental conservation	1
Tunisia	All industry	To encourage companies to make energy savings and conduct research into and develop renewable sources of energy as well as geothermal energy	1 and 2

Source: WTO Environmental Database (EDB) for 2001 (WTO, 2002a).

To sum up, the discussion above suggests that subsidies can be designed in an optimal way to internalize both negative and positive environmental externalities, to help in adjusting to new environmental regulations or to correct information asymmetries on the environment-related characteristics of a product. However, the desirability of a subsidy relative to an alternative instrument (a tax, a regulation or a tradable permit) to achieve

[160] Since 1998 the WTO Secretariat compiles annually an Environmental Database (EDB) containing all environmental-related notifications to the WTO, including subsidy notifications. The information contained in the table draws on the EDB for 2001.

a given environmental objective depends on the specific cause of the market failure, the socio-economic level of development of the country implementing the policy and the likelihood of a government failure. In order to identify the most efficient policy instrument, we must first identify what the source of the problem is. However, a national government may fail to set the appropriate policy, especially when the negative externality is global in nature. This may require international financial assistance and international agreements.

5. OTHER OBJECTIVES

This subsection discusses the use of subsidies whose stated objectives are: national security, non-trade concerns and cultural policy. In each of these cases, the existence and desirability of possible policy alternatives are analysed.

(a) National security

There are circumstances when the government-stated objective for the use of subsidies is the need to maintain national security. One example is that of food security.[161] This may be an issue for developing countries that are not able to produce or import and distribute the adequate amount of food for their population. For this purpose, governments sometimes provide subsidies to the poorest (consumer subsidies) or incentives to firms to invest in the production of food. At the global level this is an issue of redistribution and involves financial aid across countries.

However, food security is also an issue for developed countries. Japan, the Republic of Korea and Norway, for example, have stated a concern with the risk that their imports of food may be disrupted because of wars, embargoes, price shocks or natural disasters. In these cases, subsidies to increase the production of food have been justified on the grounds that maintaining capacity to produce food domestically is an insurance against moments of crisis.

The argument is that a country needs to have the capacity to produce a share of the national food demand in order to guarantee adequate food to all citizens. To the extent that the production of food requires learning-by-doing (that is, knowledge that can be acquired only by engaging in the production activity) and time is needed to make land fruitful, a certain level of production needs to be maintained. The market failure arises because of a problem of asymmetry of information, whereby it is difficult for each individual to have a correct perception of the actual risk. As a result, producers will under-invest in the production of food.

A similar argument is made for subsidies to other sectors, such as the energy sector, considered essential for any economic activity. The argument is that since a shortage of these resources would trigger a crisis in the whole economy, subsidies to these sectors to maintain a certain level of production would shelter the country from a risk of a negative external shock. Traditionally, subsidies to coal, for example, have been justified, among other reasons, on the basis of national security (see Section E). The recent dispute between Russia and Ukraine on the provision of gas has renewed political discussions on energy security in Europe.

There are ways, however, to achieve food or energy security other than subsidies to domestic industries. These include holding stocks, trading with a diversity of suppliers in order to minimize the dependency on one single country, or investing in other countries in the production of food or energy. A government policy could be, for example, to maintain a certain reserve of food or energy, say, that would partially cover the risk of emergency situations. The decision over the specific amount of the stock required would depend on the evaluation of the risk (its magnitude, duration and the likelihood of the event) and the country aversion toward risk. The stock could be maintained through import flows and the level of the stockpile could be guaranteed at any time by the diversification of countries from which the imports are originated. To the extent that the occurrence of events is not positively correlated among source countries, diversification of imports reduces the risk of emergency situations. In many circumstances, this is likely to represent a more cost-effective policy option than subsidizing domestic production.

[161] See Ingco and Nash (2004).

(b) Non-trade concerns in agriculture

The term "multifunctional", as applied to agriculture, seems to have first appeared in an international document in the World Food Summit of 1996. The Rome Declaration on World Food Security makes at least two references to the "multifunctional character of agriculture". But it was the OECD Ministers of Agriculture in 1998 who first gave it a definite meaning: "beyond its primary function of supplying food and fibre, agricultural activity can also shape the landscape, provide environmental benefits such as land conservation, the sustainable management of renewable natural resources and the preservation of biodiversity, and contribute to the socio-economic viability of many rural areas". The term "multifunctionality" is not found in the WTO Agreement on Agriculture although the related idea of "non-trade concerns" is mentioned.

There are a number of objectives that the United States, the EU and others state when providing subsidies to agricultural sectors.[162] These include socio-economic goals, such as maintaining farm income and employment in less-favoured areas, but also other goals such as protection of the environment and preservation of the countryside, control of soil erosion, extensification, aid for environmentally sensitive areas, support and protection of organic production, conservation of genetic resources, food security and providing agro-environmental amenities (for example, WTO, 2001 Committee on Agriculture, Notification EC-Domestic Support - Marketing Year 1998-99, G/AG/N/EEC/30).

The justification provided for subsidies to the agriculture sector on the ground of non-trade concerns is as follows. Agricultural production is seen as a process of joint production, where not only "commodities", such as food and fibre, are produced but also "non-commodities" which exhibit the characteristics of positive externalities and public goods (OECD, 2001b). Examples of these non-commodities include agricultural landscape and cultural heritage values, biodiversity, rural employment, food security and animal welfare. If the joint non-commodity output has a public good aspect, government provision may be necessary. If the joint non-commodity output is characterized by positive externalities, subsidies may be appropriate. For example, agricultural protection may be justified because it maintains scenic views and countryside. If there is a strong degree of complementarity between the agricultural activity and its benefit, there is a market failure. Complementarity implies that, for example, a nice landscape view is a by-product of the agricultural activity and would not exist without it. The market failure can be due to the fact that the scenic view is a sort of public good, having the characteristic of non-rivalry in consumption and non-excludability. There is a market failure because the person cultivating the land cannot appropriate all the property rights for the landscape. Under these conditions, it may make sense for the government to subsidize the agricultural activity to produce more of this public good. The notion of complementarity between agriculture production and the provision of non-commodities has been questioned. Non-commodities are not necessarily only supplied through agricultural production. One could argue that golf courses, for example, are equally attractive. Also, there are opportunity costs, including in terms of landscape and nature, to take into account when maintaining agricultural production.

In general, the concept of non-trade concerns and its analytical formulation have not been without critics. The OECD study itself admits some difficulty with the inclusion of rural employment and food security as joint outputs. In particular, rural labour is an input into the agricultural production process rather than an output. Some see the emergence of the concept of non-trade concerns as a reaction to the reduction of trade barriers in agriculture (Anderson, 2000). Others see it is a repackaging of the old rationalizations for protecting and subsidizing the agricultural sector (Freeman and Roberts, 1999). It is notable that the non-trade concerns encapsulated in the multifunctionality argument are so specific to agriculture. The argument for positive externalities in industry, such as learning-by-doing or other technological spillovers, has a much longer history in economic thought. The "infant industry" argument first appeared in List (1841). In fact, some see a parallelism in the theoretical underpinnings of multifunctionality and industrial protection in developing countries (Diaz-Bonilla and Tin, 2002).

[162] See Section E.

(c) Cultural policy

The protection of cultural heritage and promotion of cultural diversity are considered by several countries to be a public policy objective.[163] For example, audiovisual services are valued in some societies as a reflection of the social and cultural values of countries and their people. As a consequence, the manner that these services are provided and by whom are considered matters of social and political significance. The EU regulations in this area, for instance, state that "the primary purpose of regulation in the audiovisual sector is to safeguard certain public interest objectives such as pluralism, cultural linguistic diversity and the protection of minors" (European Commission, 2001, p. 3).

A policy intervention in pursuit of such objectives might be justified on the grounds that the production of local cultural products (e.g. movies, literature, theatre, music) is important for the preservation and development of a local identity, which has intrinsic value. Its value may emanate from various attributes, such as contributing to social cohesion. Products with these attributes may not be supplied by private providers in sufficient quantities to reflect their true social value. In that case, a social externality exists and governments may wish to intervene to increase production. A debate exists as to how far trade liberalization represents a menace to cultural heritage and diversity. Some argue that trade liberalization in cultural products erodes the national identity and narrows individual choice. Local cultural products are crowded out because they cannot gain enough market share to cover fixed costs. On the other hand, others tend to emphasise that trade liberalization enhances choice, which would be the case if local production were complemented by foreign competition and not squeezed out by it.

Across the world a number of different instruments have been used to achieve the objective of maintaining cultural heritage and diversity. Among these are restrictions on market access and the imposition of domestic content requirements in the audiovisual sector. For example, India has had a policy of explicitly limiting the number of foreign films. Canada has a local-content requirement in respect of television programming, as do many other governments. Where market access restrictions are imposed, these will typically take the form of quantitative restrictions of one sort or another since there are practical technology-related difficulties in applying price-based measures to imports of some of the products concerned. A number of countries exclude national treatment in respect of domestic subsidies and limit foreign shareholders (WTO, 1998a). For example, EU subsidies to the audiovisual sector are mainly targeted at supporting the production and distribution of European audiovisual products.[164] A recent study by Francois and van Ypersele (2002) identifies cultural products as products that are valued differently by consumers at home and abroad, and which are produced under economies of scale. In those circumstances, restrictions on trade in cultural products (such as quotas and tariffs), if operated by impartial, well-informed governments, can be welfare improving.

In general, subsidies and local-content requirements seem to prevail relative to tariffs as an instrument of protection in the audiovisual sector. As Janeba (2003) noted, this is probably due to three factors. First, the audiovisual sector is traditionally characterized by increasing returns to scale, and higher prices induced by tariffs or quantitative restrictions may not be sufficient to guarantee production. Second, many countries need to form local talent and local production facilities and this is more directly targeted through a subsidy. Finally, higher tariffs or more restrictive quotas increase prices and thus reduce overall consumption. To the extent that the consumption of a heritage or cultural product is deemed to have a value per se the government may want to increase the consumption of such products.

163 Literature on this topic is extensive and diverse. See, for example, Messerlin (2000), Acheson and Maule (2001), François and Ypersele (2002), Bernier (2004), Roy (2005).

164 See Section E.

6. CONCLUSIONS

This Section has illustrated how governments use subsidies to pursue a variety of objectives, either because they consider that some malfunctioning of the markets impedes them from delivering efficient outcomes or because they consider market outcomes unsatisfactory. Subsidies in the context of environmental policies and R&D support tend to be justified on the basis of positive or negative externalities. Subsidies in the context of industrial policies have been related to a variety of market failures, including learning-by-doing spillovers, information asymmetries and capital market failures. The use of subsidies to redistribute income is not linked to imperfections in the market, but to society's desire to change the market outcome.

Whatever the objective governments pursue, subsidies tend to be only one of a range of possible instruments to achieve it. The optimal policy instrument is situation-specific and needs to be determined on a case-by-case basis. Subsidies have a number of advantages compared with other instruments. They represent a relatively transparent form of government intervention, to the extent that expenses and recipients are reported in the government's budget. Given their direct impact on price signals, subsidies tend to have less undesirable side-effects than other instruments in situations where the government wishes to change market signals, for example in the presence of environmental or knowledge spillovers. But subsidies also have disadvantages. Because they have such a direct impact, beneficiaries have a strong incentive to lobby in favour of continued subsidization. In other words, the use of subsidies makes the government prone to capture by recipient industry groups or other groups in society. One way of reducing this danger is to link subsidization to objective performance criteria whenever possible.

As with any government intervention, it is difficult in practice to design subsidies in such a way that they do not have any unintended negative side-effects. This Section has shown that undesired side-effects can be minimized by targeting a subsidy policy as precisely as possible in terms of recipients. This is, however, not a general rule and it could be argued that the risk of government capture increases the smaller and better defined the recipient group.

The discussion in Section C showed that subsidies can have trade-distorting effects. Such effects may be intentional, for instance in the case of subsidies that respond to pressure from import competing industries, or they may be unintentional. The question therefore arises how WTO subsidy rules ensure that when subsidies are used, they serve an economically sound policy objective. This question will be analysed in more detail in Section F. The discussion in this Section indicates that such an economic analysis of the WTO rules on subsidies can only be carried out in the light of existing rules on the use of alternative instruments – like tariffs (to assist infant industries) or regulation (to protect the environment) – given that governments can pursue a given policy objective with various instruments.

Another issue that has been raised in this Section on government objectives will reappear in Section F. This is the issue of the targeting of subsidies. The SCM Agreement aims at disciplining so-called "specific" subsidies, i.e. subsidies that are limited to certain enterprises. It could therefore be argued that "more targeted" subsidy programmes are more likely to be considered "specific" under WTO law and more likely to be submitted to SCM rules. The discussion of each of the policy objectives has therefore included a discussion of the advantages and disadvantages of targeted or general subsidies in the different contexts.

This Section's examination of infant-industry arguments in favour of using subsidies for industrial development purposes shows that the controversy over this variant of the infant-industry argument does not centre on theory but rather on empirical and practical matters. In the presence of learning-by-doing spillovers, and of certain types of information asymmetries and capital market failures, selective subsidies can be theoretically shown to be welfare improving for the domestic economy. What is a matter of intense debate is whether, when political economy considerations and implementation problems are taken into account, such interventions are still advisable. Those who believe that government failures are more important than market failures support laissez-faire policies. Those who believe that government failures are not more important than market failures would not reject the use of subsidies for industrial development.

A survey of the industrial policy literature also showed that from the point of view of implementation, export promotion has some advantages over import substitution. The first is that chances to pick an industry where the country has a comparative advantage are better. The second is that the costs of subsidies, which, ideally, show up in budgets, are more transparent than those of tariffs. A third argument is that export performance is a criterion not too amenable to rigging by the firms or their bureaucratic counterparts.

The presence of knowledge spillovers linked to R&D activities is a well-known phenomenon and there is wide agreement on the need for government intervention in this field. The protection of intellectual property can partly correct for the existing market failure and increase private sector incentives to invest in R&D activities. But additional measures in support of R&D may be desirable, in particular in the case of R&D activities that require very high investments. It is generally accepted that R&D subsidies can form an appropriate tool to encourage knowledge creation, but there is no agreement on the form such intervention should take. Location and proximity matter for knowledge spillovers and some observers would argue that spillovers occur mainly within an industry. If such is the nature of knowledge spillovers, R&D subsidies should target specific locations and/or industries. This is to some extent what governments do when applying so-called cluster policies. Yet such policy approaches are prone to capture and imply that governments know how to "pick" or "recognize" winners. Many therefore continue to oppose targeted R&D policies and argue in favour of more general policies that aim at raising the economy-wide level of research expertise, like support to university education and research.

High R&D intensity is frequently associated with imperfect competition in the sectors concerned, which might induce governments to use subsidies to shift rents or pursue other strategic objectives. The use of subsidy programmes in support of "national champions" that are considered to be of particular value for the economy is a frequent phenomenon and is often observed in R&D-intensive sectors. Such policies are likely to be hurtful to trading partners that are themselves active in the same industry. On the other hand, they may be beneficial for trading partners that only import the relevant service or good, as increased competition may lower consumer prices. Given the nature of strategic subsidy schemes, the risk of government capture is particularly high. The more governments enter the rivalry, the more likely that funds end up being dissipated in excessive entry, possibly leading to consumer prices that are higher than necessary, as none of the supported companies can produce at an efficient scale.

Environmental subsidies can be designed in an optimal manner to internalize both negative and positive environmental externalities and to correct information asymmetries on the environment-related characteristics of a product. In addition, they may serve to favour the adjustment to new environmental regulations. However, the desirability of a subsidy relative to an alternative instrument (tax, a regulation or a tradable permit) to achieve a certain environmental objective depends on the specific cause of the market failure, the socio-economic level of development of the country implementing the policy, and the likelihood of a government failure. Whether environmental subsidies should be cross-sectoral or rather targeted at a specific sector also needs to be decided on a case-by-case basis. To the extent that the environmental problem is sector specific, there is an economic argument to target the subsidy to a specific sector.

Governments also frequently employ subsidies to pursue income distribution objectives, although this may not always be the most efficient instrument. Where they are used, however, subsidy programmes should be as targeted as directly at the beneficiary as possible, otherwise the amounts earmarked may end up benefiting those who are not deserving. This problem was highlighted in this subsection with the discussion of subsidies for water utilities.

By targeting the assistance so that it is delivered to the target population, industry or firm, the welfare cost of the subsidy programme is lowered. But, in a sense, this principle goes against the grain of WTO agreements which consider a subsidy a problem the more specific it is. This is because the more specific subsidies are, the greater the assistance that they will be able to provide to an industry or to a firm, with potentially a greater output and trade response. It is not the intention here to exaggerate this possible conflict, but only to highlight the careful balancing act that governments must perform to ensure that their pursuit of legitimate policy goals, with the use of subsidies, do not run counter to their obligations under international agreements.

E THE INCIDENCE OF SUBSIDIES

This Section provides an overview of the use of subsidies both at the global level and at different levels of geographical and sectoral disaggregation. Given the quantity and quality of the available data it is not possible to provide a comprehensive and systematic picture of the incidence of subsidies.

Although a number of sources exist from which information on subsidies can be obtained, definitions and classifications differ in most cases and are difficult to reconcile. Data from international sources that allow for cross-country comparability either only exist at a highly aggregated level, or are available for a limited number of (sub)sectors (e.g. fisheries and agriculture) or instruments (e.g. export credit support).[165] For other sectors, like services and export processing zones (EPZs), no comprehensive international data source exists that provides quantitative information which is comparable across countries. Among the sources of information used here are national and supranational subsidy reports, information from WTO notifications under the Agreement on Subsidies and Countervailing Measures (SCM) and the Agreement on Agriculture (AoA) and information from the WTO's Trade Policy Review (TPR) reports (Box 12). National subsidy reports provide quantitative information that is likely to be comprehensive and accurate but does not guarantee cross-country comparability. WTO notifications contain quantitative information. Compiling and analysing this information is difficult, however, as it has not been provided according to clear and consistent statistical definitions. The information contained in TPR reports is mostly descriptive, and has been reported in this Section mainly for illustrative reasons.

Box 12: The WTO's Trade Policy Review Mechanism

In order to enhance the transparency of Members' trade policies and thus facilitate the smooth functioning of the multilateral trading system, WTO Members established the Trade Policy Review Mechanism, whose function is to review the trade policies of each WTO Member at regular intervals. Annex 3 of the Marrakesh Agreement establishes that the four Members with the largest shares of world trade (currently the European Communities, the United States, Japan and China) be reviewed each two years, the next 16 be reviewed each four years, and others be reviewed each six years. A longer period may be fixed for least-developed country Members.

Reviews are conducted by the Trade Policy Review Body on the basis of a policy statement by the Member under review and a report prepared by staff in the Secretariat's Trade Policy Review Division. In preparing the reports, the Secretariat seeks the cooperation of the relevant Members, but has the sole responsibility for the facts presented and the views expressed.

The Trade Policy Review (TPR) reports contain detailed chapters examining the trade policies and practices of the Member and describing trade policymaking institutions and the macroeconomic situation. For the purpose of this report the information on Members' subsidies contained in the TPRs is of particular interest. Reflecting the different types of subsidies distinguished in the SCM Agreement, information on subsidies can be found in three parts of the TPR reports – in the subsection on measures directly affecting exports, in the section discussing trade policies and practices by sector, and in the subsection discussing government incentives or subsidies that do not directly target imports or exports but may nevertheless have an impact on trade flows. Although information on subsidies is generally collected against the background of the definition of "subsidies" established by the SCM Agreement, not all data recorded in TPR reports are necessarily compatible with this definition.

The selection of the content of reports is not driven by subsidy-related issues and problems, but rather by a Member's main policy challenges and constraints. Besides, the coverage of reports is to a large extent determined by the availability of data. As a consequence, the amount of information contained on subsidies in TPR reports varies from Member to Member. The fact that some reports do not include

[165] See the discussion on the OECD Export Credit Arrangement in Section D.

subsidy-related information, therefore, does not necessarily point to the absence of such schemes in the Members concerned. Nor does the availability of extensive and detailed information on subsidies in a TPR report necessarily mean that the use of subsidies is more predominant in the relevant Member than in other Members. TPR reports do not normally attempt to assess the effects of subsidies on trade and due to the limited level of detail available, it is in many cases difficult to identify the extent to which a benefit is actually being conferred or the identity of the recipient of the subsidy.

Notwithstanding their shortcomings, in particular with respect to cross-country comparability, TPR reports constitute one of the few sources that systematically collects information on subsidies for a broad range of countries and a broad range of economic activities.

The structure of this Section has to a large extent been determined by the availability of data. It starts with an overview section that serves two purposes. First, it attempts to give a picture of the evolution of the use of subsidies over time and across regions and countries. Second, it compares for a number of countries, information on the value of subsidies obtained from different sources, i.e. the National Accounts Statistics (NACC), national subsidy reports and WTO notifications. It therefore illustrates the implications that differences in subsidy definitions have for the measurement of subsidies.[166] The overview section is followed by three subsections focusing on specific sectors: agriculture, industry and services. The quantity and quality of the data available for each sector differs significantly, with the information available for the agricultural sector probably being the most comprehensive, whereas the information on the services sector can hardly be used for statistical analysis. Many of the findings presented in the report have to be interpreted carefully, given methodological limitations and the incomplete coverage of the underlying information.

1. OVERVIEW

The most widespread, standardized information on "subsidies" is provided in National Accounts Statistics (NACC) for which country data are available worldwide. The subsidy definition used in NACC has been discussed in quite some detail in Section B of this Report. There, it was pointed out that this subsidy definition is rather narrow, for example because it only comprises one particular form of subsidization, i.e. direct payments by the government. Other subsidies, like tax concessions and loan guarantees, are not included. On the other hand, all levels of government and all sectors are – in principle – covered.

The basic data sources for subsidies as defined by NACC are (a) the OECD National Accounts Statistics data base as provided through Olisnet, (b) United Nations, National Accounts Statistics Volume and (c) national sources. National sources provide, in some cases, a breakdown of subsidies by industry and by function, which is not found in the data provided by international sources. Sometimes a breakdown is also given by government level (federal/central, state and local). A breakdown combining industry and state level is rare. National account statistics from national sources have been used in this Section to give information on the sectoral breakdown of national subsidies. This information is only available for a small number of countries, including Brazil, Colombia, Germany and India.

The second source of information on national subsidies is government finance statistics. In a compact, standardized format, information on subsidies is provided by the IMF, Government Finance Statistics Yearbook (GFS). In addition to providing the overall government level of subsidies, this data set is broken down into central (federal), state and local government categories. In most cases, federal subsidies predominate, but in some cases they account for less than half of the total (e.g. Canada). Subsidies reported according to the GFS 2001 closely match those collected under the National Accounts System (for the developed countries). National sources of government finance often provide even more detailed statistics than is published internationally, but for this information standardization is often not assured.

166 Different definitions of subsidies were analysed in Section B.

Besides the NACC and the GFS one can also find national and supra-national studies on economy-wide subsidies. Such studies are publicly available only for a very limited number of countries, including Australia (Productivity Commission, Trade and Assistance Review), Germany (Ministry of Finance, Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen) and at the supra-national level the European Union (European Commission, State Aid Scoreboard). These studies have the advantage that they offer a wealth of detailed information not available in the NACC and GFS data, which is the main reason for including this information in this Report. The frequent references to subsidies in Australia, the European Union and, to a lesser extent, Germany are, therefore, entirely due to the fact that detailed and comprehensive information on subsidies can be easily accessed by the general public.

As for notifications by WTO Members, the SCM Agreement, the AoA Agreement and Article XVI of GATT 1994 require WTO Members to provide information about their use of subsidies. Members are required to submit a notification of all specific subsidies at regular intervals. In addition, Members are required to notify all other subsidies "which operate directly or indirectly to increase exports of any product from, or to reduce imports of any product into, the territory of the Member granting or maintaining the subsidies" pursuant to Article XVI of GATT 1994. In principle, therefore, WTO notifications represent a rather unique source of information on the use of subsidies.

Certain subsidies are actionable or forbidden under the WTO Agreements. Members are undoubtedly aware of this when making their notifications. Article 25.7 of the SCM Agreement is seemingly meant to encourage Members to provide information, as it clearly states that the notification of a measure does not prejudge the measure's legal status under GATT 1994 and the SCM Agreement, its effects under the SCM Agreement, or the nature of the measure itself. Even so, a significant number of WTO Members do not fulfil their notification requirements at the required intervals. This and other caveats with respect to the quality of the quantitative information provided in the WTO notifications under the SCM Agreement are explained in more detail in Box 13.

Box 13: Technical note on the compilation of quantitative data from WTO notifications according to the SCM Agreement

Article 25.1 of the SCM Agreement and Article XVI of GATT 1994 require WTO Members to provide information about the use of subsidies in their territory. Members are required to submit a new and full notification of all specific subsidies every three years, with updated notifications due in the intervening years. The frequency of notifications was discussed in the Committee on Subsidies and Countervailing Measures in May 2001, and Members agreed that their resources would be best utilized by giving maximum priority to submitting new and full notifications every two years, and by de-emphasizing the review of the annual updating notifications.

Not all Members fulfil the notification requirements at the expected frequency. Twenty nine of the currently 149 WTO Members have so far not submitted any notification pursuant to Article 25.1 of the SCM Agreement or Article XVI of GATT 1994. This group includes mainly LDCs like Bangladesh and Tanzania, but also non-LDCs like Kenya, Kuwait and Malta. Other Members do not provide quantitative information on subsidy programmes or do not provide this information systematically, like in the case of Chile, Colombia, Mexico and New Zealand. As a result, in most years, information is only available for less than half of the WTO Membership.[1]

The information used for this Report only takes into account programmes for which quantitative information is available. Article 25.3 requires Members to provide information on the value of subsidies per unit, or, "in cases where this is not possible, the total amount or the annual amount budgeted for that subsidy". Nevertheless, Members frequently indicate in their notifications that no information on the value of the subsidy is available. The "per unit" value of subsidies has probably the most

informative value for trading partners, as it indicates the extent to which subsidies may affect the costs of competitors in the subsidizing country and/or resulting market prices. This Section instead uses information on annual amounts budgeted for subsidy programmes, as it facilitates the comparison with the information from other data sources. Article 25.3 also requires Members to provide an assessment of the trade effects of subsidies. This information is, however, hardly ever provided.

In general, the quantitative information provided in the notifications is characterized by a lack of clarity and consistency, for instance as regards the unit and/or the currency of measurement that have been used. The impression also arises that not all programmes are reported consistently, as programmes may suddenly disappear and re-appear in notifications. Compiling the information contained in the notifications thus required a significant amount of interpretation and the analysis presented of those data should be read with caution.

[1] It cannot be concluded that Members who do not provide any information on subsidies for a specific year do not grant any subsidies in that year. Indeed, Article 25.6 of the SCM Agreement stipulates that Members who consider that they provide no specific subsidies should inform the WTO Secretariat in writing. Albania, for instance, notified that: "In accordance with Article 25.1 of the Agreement on Subsidies and Countervailing Measures and Article XVI:1 of the GATT 1994, the Government of Albania wishes to inform you that Albania does not grant or maintain within its territory any subsidy within the meaning of Article 1.1 of the Agreement on Subsidies and Countervailing Measures which is specific within the meaning of Article 2 of the Agreement, or which operates directly or indirectly to increase exports from or reduce imports into its territory within the meaning of Article XVI:1 of the GATT 1994". (G/SCM/N/123/ALB) .

(a) Tentative review of the subsidy incidence in an historic and cross-country perspective.

The description of the evolution and the structure of subsidies below is based on information provided in NACC. Information from other sources will be indicated in each case. The limitations of the subsidy data based on NACC should be kept in mind to appreciate the findings presented below.

Besides the absolute size of subsidy outlays, their historic evolution by country and worldwide is of major interest. As regards the absolute size, it would appear that 21 developed countries spend nearly US$250 billion in 2003 on subsidies. Governments throughout the world provided more than US$300 billion. In respect to the long term trend of national subsidy levels, the ratio of subsidies to GDP can be reported for most of the developed countries back to the 1960s and in some cases even back to the 1950s (Table 6). Looking at decade averages of this subsidy ratio, one finds that the 1970s and 1980s were periods with significantly higher subsidy to GDP ratios than either the 1960s or the 1990s. For the 1990s and the 2000-04 period, the ratios of subsidies to GDP decrease markedly from their levels prevailing in the 1970s and 1980s in the EU(15), Norway, Canada and Japan. For the United States, the ratio of subsidies to GDP remained rather stable. Over the entire 1960-2004 period, the level of subsidies (as measured by the NACC) in the United States, at about one-half of a per cent of GDP, was always smaller than in the other developed countries. The European countries report a much higher subsidy level, while Japan takes an intermediate position between the United States and the EU. Canada's subsidy level was rather close to the EU level, while those of Norway and Switzerland exceeded the EU level.

As regards the more recent evolution of subsidies, the available national accounts data point to rather stable and historically low levels of subsidies since 2000. The (value weighted) average ratio of subsidies to GDP for the developed countries remained at or slightly below 1 per cent in each year between 1998 and 2003. The average ratio of the EU(15) stagnated at a record low of 1.2 per cent in 2000-02 and rose to 1.6 per cent in 2003. In Australia, the ratio remained flat at 1.3 per cent over the 2000-03 period. In the United States, there was a peak in the subsidy ratio in 2001 (partly due to the special subsidies granted to US airlines), but by 2004 the nominal value of subsidies had fallen below the level reached in 2000. In Japan, the ratio reached 0.9 per cent in 2000 and remained unchanged at 0.8 per cent in 2001-03. The stability of subsidy levels is also confirmed if one looks at the median and average arithmetic value of the ratio of subsidies to GDP of all developed countries, which stayed at around 1.5 per cent between 2000 and 2003.

Table 6
Long-term development of subsidy levels in developed countries, 1950-2004
(Percentages, subsidies as a ratio of GDP)

	1950-60	1960-69	1970-79	1980-89	1990-99	2000-04
Austria	...	2.0	2.3	2.9	2.9	3.1
Belgium	...	2.0	3.3	3.5	2.1	1.5
France	...	...	2.2	2.8	1.8	1.3
Germany	0.5	1.4	2.2	2.2	2.0	1.5
Italy	...	...	2.5	3.4	1.9	1.1
Spain	...	...	1.2	2.3	1.9	1.1
Sweden	...	...	2.8	4.6	3.9	1.5
United Kingdom	1.8	1.9	2.4	1.9	0.8	0.6
EU (12 joined series)	...	...	2.2	2.8	2.0	1.4
EU (15 joined series)	...	...	2.3	2.8	1.9	1.2
Norway	4.5	3.9	5.2	4.5	3.7	2.2
Switzerland	...	...	...	...	4.1	4.0
Australia	...	...	1.1	1.6	1.3	1.3
Japan	0.4	0.8	1.3	1.2	0.8	0.8
Canada	0.4	...	1.6	2.4	1.3	1.2
United States	0.1	0.4	0.4	0.5	0.5	0.4

Note: For 1950-60 not always full period covered. Germany refers to West Germany up to 1989.
Source: OECD, National Accounts Statistics.

For the developing countries, the information is more scattered. A general conclusion is therefore not possible but the fragmentary data available suggest that the evolution is not uniform. In the case of Brazil, the ratio declined between the years 2000-01 and 2002-03 (from 0.4 per cent to 0.2 per cent), while it increased in the case of India from 2.5 per cent on average for FY 1999-00 and 2000-01 to 2.9 per cent on average for FY 2002-03 and 2003-04.

It is often assumed that subsidy levels are lower in developing countries than in developed countries. Indeed, on the basis of National Accounts data for the years 1998 through 2002, the share of subsidies to total government expenditure and to GDP in developing countries seems to be lower than for developed countries, as illustrated in Table 7 (and Appendix Table 1). From a sample of 22 developed and 31 developing countries it was found that the arithmetic average ratio for the period was with 0.6 per cent for the developing countries, less than half the corresponding rate of the sample of developed countries (1.4 per cent). The difference between the developing and developed countries is also pronounced for the ratio of subsidies to government expenditure (4.4 per cent and 8.2 per cent respectively).[167]

Table 7
Overview of worldwide subsidies as a ratio of government expenditure and GDP, 1998-2002
(Percentage)

	Ratio of GGFCE[a]	Ratio of GDP
All countries (69)		
Median	5.5	0.9
Average	6.6	1.2
Maximum	36.1	5.7
Minimum	0.2	0.0
Developed countries (22)		
Median	6.7	1.4
Average	8.2	1.5
Maximum	36.1	4.1
Minimum	0.9	0.2
Developing economies (31)		
Median	3.3	0.5
Average	4.4	0.6
Maximum	21.0	2.6
Minimum	0.2	0.0

[a] General Goverment Final Consumption Expenditure.
Source: OECD, National Accounts Statistics, UN, National Accounts Statistics, IMF, Staff reports Article 4 consultations and national statistics.

Subsidies are granted at the central, state or local government level and sometimes even at the supra-national level. For the year 2003, a large variation was found in the relative importance of the central

[167] For the developed countries the weighted average subsidy ratio is significantly smaller than the arithmetic average subsidy ratio as the weight of the large economies with low ratios (e.g. United States and Japan) is larger than in the simple average calculation. For the 1998-02 period, the developed countries average ratio of subsidies to GDP was 1.5 per cent while the weighted average was 0.95 per cent.

government in total government subsidies, as illustrated in Appendix Table 2.[168] It is therefore important to be aware which level of government is covered by a specific review of subsidies. In some countries the federal government accounts for more than 90 per cent of total subsidy expenditures (e.g. United States, Finland and Portugal) while in other countries the federal government accounts for less than half (e.g. Canada 25 per cent, Germany 35 per cent, Belgium and Japan 49 per cent). In most of the countries examined, the share of the federal government in total subsidy expenditure is in the range of 60 to 70 per cent (e.g. France, Italy, Netherlands and the United Kingdom). Again, data for the developing countries are more difficult to obtain, especially for recent years. In the case of Brazil and India the share of the federal government in total subsidy expenditure was 77 per cent and 55 per cent respectively.[169]

One of the major differences between the subsidy data provided by NACC and the (supra-)national subsidy reports is the treatment of tax concessions. In order to have a first rough guess about the relative importance of direct grants and tax concessions in total subsidies, one has to review the special studies which report both grants and tax concessions. In the case of Australia (and for the limited range of sectors and government units covered), it seems that subsidies in the form of tax preferences are as important as direct payments reported as budgetary allowances. In Germany, the share of tax preferences in total subsidies was 46 per cent for all government units and nearly two-thirds at the federal level alone.[170] In the case of the EU, the majority of subsidies provided by member governments for manufacturing and services are in the form of grants (67 per cent in the 2001-03 period).[171] Tax exemptions and tax deferrals account for 25.3 per cent and the remainder are in the form of soft loans, guarantees and equity participation. However, significant differences exist among EU Member States in the use of the various instruments.

(b) How much do countries subsidize according to different data sources?

Comparing the information on the use of subsidies provided by different data sources is an interesting exercise in itself as it illustrates how much or how little is actually known about the incidence of subsidies. This subsection compares information from NACC, subsidy reviews from a selected number of countries and the WTO notifications. This comparison therefore also serves to highlight to which extent the notification obligation under the WTO fulfils its purpose of providing transparency on the use of subsidies.

(i) Incidence at the national and supra-national level

When comparing information from alternative data sources, the different subsidy definitions used need to be kept in mind. It is difficult a priori to determine whether the definition of subsidies in NACC is broader or narrower than that used in the (supra-)national subsidy reviews mentioned above. In the case of the German government's subsidy report, all subsidies covered in NACC are also covered in the subsidy review and the subsidy component of tax preferences is also provided. Therefore, in its summary overview the overall subsidy level indicated by the subsidy report is significantly larger than indicated in German national account statistics (e.g. for the year 2000, the government study indicates subsidies worth €59.4 billion while the NACC data report only €40.7 billion). In respect of federal government subsidies, NACC data report subsidies worth €10.5 billion in 2000 while the subsidy review reports €23.1 billion with tax preferences included.

In the Trade and Assistance Review 2003-04 of the Australian Productivity Commission, all those subsidies that are considered not to distort competition are excluded from the review. Also excluded are almost all subsidies at the state and local level, which in FY 2002-03 accounted for half of the subsidies registered under

168 "General" subsidies refer to the total amount of subsidies in the terminology of relevant IMF statistical sources.

169 The large variation observed in the share of the federal government in total subsidy expenditure should be a warning for all those who study detailed subsidy expenditure programmes at the federal level only. In this respect, the detailed review of the Australian Productivity Commission on budgetary assistance provides only information on about half the subsidies granted by government units in Australia (the restricted coverage is well flagged by the authors of the report).

170 Data for year 2002, see 19th Subventionsbericht, p. 27, Table 9.

171 See Chart 5 in EU Spring 2005 State Aid Scoreboard.

the NACC (see Appendix Table 2). The exclusions in the report of the Productivity Commission exceed by far the value of the additions made in the form of tax breaks/exemptions (see Table 8).[172]

Table 8
Subsidy expenditure according to different sources, 1998-2002
(Period averages, billion dollars)

	National Accounts Data (NACC)	National/supra-national review	WTO notifications
Developed countries			
Australia	4.7	2.3 [a]	0.3
Canada	7.7	...	0.9
EU (15) - total	109.0	...	96.3
EU (15) community level	...	...	82.4
EU (15) member level	...	80.3 [b]	13.9
Germany	33.7	56.9 [c]	3.1
Japan	34.3	...	4.2
Norway	4.1	...	2.9
Switzerland	10.8	...	0.7
United States (all)	43.5	...	16.3
United States (federal)	41.5	...	16.2
Developing economies			
Brazil	2.0	...	1.7
China	13.2 [d]	...	...
India	12.2	...	...
Korea, Republic of	1.0	...	1.3
South Africa	0.9	...	...

[a] Mainly federal level, not all sectors.

[b] Including partly estimated railway subsidies.

[c] All government levels (incl.EU) and all sectors.

[d] State level. Referring to 2000-02.

Source: Bundesministerium der Finanzen (2003), European Commission (EC) (2005a), IMF (2005), Productivity Commission (2004) and WTO Secretariat.

The definition of "government" in the SCM Agreement is rather comprehensive as it includes all the administrative units at the federal, state and local level and also any other "public body". As discussed in Section B, the various forms of subsidy covered by the SCM definition is also rather wide, as it includes direct transfers of funds, tax concessions and potential direct transfers. Covered by the definition are also the second category of subsidies, i.e. "the provision by the government of goods and services (other than infrastructure) or and the purchase of goods" in the terminology of the SCM Agreement. Notifications under the SCM Agreement only cover goods. Subsidies to the services industries are not covered by WTO notification requirements.[173] The empirical evidence shows that subsidies to the services sector are a major part of government subsidies reported in NACC or Government Finance Statistics.[174] Comparing the subsidies data provided by the WTO notifications with those given in NACC, one has to recall that both have a similar definition of government but the former covers more forms of subsidies, in particular tax preferences, while the NACC has a significantly higher sectoral coverage due to the inclusion of services industries. In addition, the notifications data are in principle limited to "specific subsidies" which may imply that horizontal subsidies – that is, subsidies not explicitly targeting a sector – may not always be included. When interpreting the

[172] True, the Productivity Commission adds an estimate on the subsidy equivalent of the tariff structure which can be quite substantial for some sectors. However, the subsidy element of tariffs is not available for other countries and is therefore excluded from our comparisons.

[173] Some notifications do contain information on subsidies to services sectors. Their value, however, tends to be negligible in the notifications.

[174] Enterprises in the German services industries (private and public) received two-thirds (or €23.8 billion) of all subsidies granted to resident enterprises in 2003. (Source: Fed. Statistical Office, Volkswirtschaftliche Gesamtrechnungen, Produktions und Importabgaben sowie Subventionen. Gliederung nach Wirtschaftsbereichen, 2005).

quantitative information presented here on WTO notifications, a number of technical issues need to be kept in mind. These are explained in Box 12.

Comparing the data on subsidies from various sources for the period 1998-2002 not only reveals large discrepancies, but also raises questions about the completeness of WTO Member notifications (see Table 8). For the United States, the reported annual average value for the four-year period, including state and local subsidies, was US$16.3 billion, less than half the value reported in national accounts (US$43.5 billion). In Japan, the notifications report US$4.2 billion in subsidies while the national accounts report US$34.3 billion. Australia notifies subsidies of US$0.3 billion to the WTO, while in the NACC they rise to US$4.7 billion. For the EU(15), the notifications amount to US$96.3 billion (community and individual members combined) which are not so far off the NACC figure of US$109 billion and the EU Scoreboard (which excludes community subsidies) value of US$80.3 billion. As indicated above, the exclusion of services in the notification requirements and the absence of quantification of many subsidy programmes in the notifications are an important element in the discrepancies.

(ii) Sectoral allocations

The breakdown of subsidies by industry is rarely provided in the summary National Accounts data. For a few countries this information was found in NACC (e.g. Brazil, Colombia, Germany and India). For the United States, only a very broad breakdown by five industry groups is published. Specific regular reports on subsidies by industry are prepared in at least two countries (Australia and Germany) and by the EU Commission on subsidies provided by Member States. Analysing the industry breakdown of these reports is not a straightforward exercise. First, there is often a difference between total subsidies granted and the amount broken down by industry, as some subsidies are not specific to a particular industry but of a general nature. Sometimes these subsidies are labelled as "horizontal" subsidies. Second, the comparability of the different subsidy reports and the data derived from NACC are quite limited due to differences in the definition of subsidies, as discussed before.

Given the present data situation, it is impossible to come up with an estimate on the sectoral breakdown of global subsidies. Nevertheless, some indications can be obtained on the sectoral distribution of subsidies. The first observation which can be made is that the available data point to a large variation in the sectoral distribution of subsidies among countries. For Colombia and Brazil, the data point to a low share for agriculture (less than 20 per cent) and a high share for services (more than 50 per cent). In India, the data point to a very large share of agricultural subsidies (more than 50 per cent), followed by industry (about one-fifth) and services (about one-eighth).[175]

Among the EU members, the share of industries in national subsidies differs substantially (excluding the subsidies provided by the EU directly, which are focused on agriculture and fisheries). According to the EU scoreboard data, the overall state aid, which excludes subsidies to rail transport, provided by member countries is concentrated in the industrial sector (more than two-thirds in 2003). Within industry, most aid goes to the manufacturing sector but in some cases coal subsidies also account for a large share. Services subsidies have a small share (less than 10 per cent at the combined country level). Portugal is a unique case among the EU members, with a share of nearly two-thirds for services (see Table 3 in EU scoreboard update Spring 2005, page 16). By adding the subsidies provided by the EU (which focus on agriculture and fisheries) the importance of agriculture rises substantially and that of services dwindles even further.

The Annual Review of Trade and Assistance by the Australian Productivity Commission provides some detail on the sectoral distribution of subsidies. If one excludes the subsidies which are not allocated by sector, one finds that Australian subsidies go largely to the industrial sector (in particular to motor vehicles), one-quarter to agriculture and one-fifth to services.[176]

[175] India, Central Statistical Office(CSO), National Accounts Statistics 2005 website http://mospi.nic.in/mospi_cso_rept_pubn.htm, accessed January 2006. For the sectoral distribution in India only subsidies for "economic services" have been taken into account, which cover more than 90 per cent of all subsidies reported in India's National Accounts Statistics.

[176] Data refer to fiscal year 2003-04. See Table 2.1 of Trade and Assistance Review 2003-04.

WTO notifications also provide information on the sectoral allocation of subsidies and this information has been used to generate Table 9. Members are required by Article 25.4 to organize their notifications by product or sector, if subsidies are granted to specific products or sectors. Often the title of a subsidy program therefore indicates whether the subsidy targets the agricultural sector or industry. In other cases, the name of the granting authority or the description of the programme was used to classify information. All programmes that could not be allocated clearly to either the agricultural sector or the industrial sector were classified as "horizontal programs". This category, for instance, includes regional and R&D programmes.

Table 9
Sectoral allocation of subsidies notified by selected WTO Members, yearly average 1999-2002
(Percentages)

	Agriculture	Industry	Horizontal
Australia	30	51	19
European Communities	42	8	50
EU (15)	1	19	80
Japan	78	22	0
United States	60	8	32

Source: WTO Secretariat.

The sectoral breakdown of subsidies provided in the notifications reveals that agriculture accounts for a much larger part than industry in total subsidies for the EU(15) at the community level, Japan and the United States. In Australia, however, industry takes the largest part. The importance of horizontal subsidies also varies greatly, ranging from nil in Japan to one-half in the case of the EU(15).

(c) Conclusions

To sum up, the choice of the yardstick to measure subsidies (NACC, specific reviews or WTO notifications) has a significant impact not only on the level of subsidies but also on their composition by industry or instrument (grants or tax preferences). Given the uncertainty surrounding the economy-wide subsidy estimates, industry specific data sources such as those on agriculture and fisheries are likely to be more reliable for economic analysis.

The comparison presented in this Section of WTO Member notifications with data on subsidies from other sources raises questions about the completeness of WTO Member notifications. As a consequence, it is questionable whether the notification requirement has so far achieved its aim of enhancing transparency with respect to the use of subsidies by WTO Members.

Appendix Table 1
Subsidies, government expenditure and GDP, 1998-2002
(Percentage, period average)

Country	Subsidies as % of government expenditure Average	Subsidies as % of GDP
Developed countries		
North America		
Canada	5.8	1.1
United States	3.1	0.5
Europe		
Austria	16.4	3.0
Belgium	6.9	1.5
Bulgaria	11.7	2.0
Czech Republic	12.7	2.8
Denmark	8.6	2.2
Estonia[a]	5.1	1.1
Finland	7.1	1.5
France	5.6	1.3
Germany	8.7	1.7
Greece	0.9	0.2
Hungary	7.6	1.7
Iceland	7.1	1.7
Ireland	5.4	0.8
Italy	6.6	1.2
Latvia	5.3	1.1
Lithuania	4.2	0.9
Luxembourg	9.6	1.6
Netherlands	6.5	1.5
Norway	11.7	2.3
Poland	4.3	0.7
Portugal	6.9	1.4
Slovakia	11.7	2.3
Spain	6.5	1.1
Sweden	6.4	1.8
Switzerland	36.1	4.1
United Kingdom	2.8	0.5
European Union (25)	6.8	1.5
Asia		
Australia	6.7	1.2
Japan	4.9	0.8
Commonwealth of Independent States (CIS)		
Armenia	6.1	0.7
Azerbaijan	8.7	1.3
Belarus	28.1	5.7
Kazakhstan	1.3	0.1
Kyrgistan	4.1	0.8
Republic of Moldova	8.1	1.4
Russian Federation	14.9	2.5
Ukraine	11.3	2.3

Country	Subsidies as % of government expenditure Average	Subsidies as % of GDP
Developing economies		
Mexico	3.3	0.4
South and Central America		
Aruba[b]	1.1	0.2
Bolivarian Rep. of Venezuela	3.1	0.2
Brazil	1.8	0.3
Chile[a]	3.6	0.4
Colombia[a]	3.4	0.7
Costa Rica	6.8	0.9
El Salvador[e]	0.2	0.0
Netherlands Antilles[c]	3.3	0.8
Panama	3.2	0.5
Trinidad and Tobago[a]	7.0	0.9
Africa		
Benin[c]	0.9	0.1
Botswana	1.6	0.5
Côte d'Ivoire[b]	3.9	0.6
Kenya	0.3	0.1
Morocco[a]	10.8	1.8
Mozambique[a]	1.0	0.1
Namibia[a]	1.2	0.3
Nigeria[d]	0.2	0.0
South Africa	3.9	0.7
Tunisia	10.3	1.6
Middle East		
Israel	2.6	0.7
Iran, Islamic Republic of	11.7	1.6
Kuwait[c]	1.2	0.3
Oman[a]	0.6	0.1
Qatar[a]	0.4	0.1
Asia (developing economies)		
China[e]	5.7	1.1
India	21.0	2.6
Malaysia	7.9	1.0
Mongolia[b]	0.7	0.3
Philippines	2.4	0.3
Korea, Republic of	1.7	0.2
Sri Lanka	4.8	0.7
Taipei, Chinese	3.8	0.5
Thailand	3.8	0.4

[a] Average 1998-2001; [b] Average 1998-2000; [c] Average 1998-99; [d] Average 1999-2002; [e] Average 2000-02.
Source: OECD, NACC; UN, National Accounts Statistics; IMF, Staff reports Article 4 consultations and national statistics.

Appendix Table 2
General and central government subsidies in selected countries in 2003
(Percentages)

	Year	Subsidies as a ratio to GDP		Share of central government in total government subsidies
		General government	Central government	
Developed countries				
United States	2003	0.4	0.4	99.7
Canada	2003	1.2	0.3	25.4
Australia	2003	1.3	0.7	51.1
Japan (FY)	2003	0.8	0.4	48.9
Euro Area				
Austria	2002	2.8	1.6	58.5
Belgium	2002	1.6	0.8	49.4
Finland	2003	1.3	1.3	94.0
France	2003	1.3	0.8	56.4
Germany	2003	1.4	0.5	35.0
Italy	2000	1.2	0.7	56.5
Netherlands	2003	1.4	0.8	58.7
Portugal	2001	1.3	1.2	92.2
Spain	2002	1.1	0.6	56.1
Denmark	2003	2.1	1.7	78.0
Iceland	2002	1.8	1.4	81.8
Norway	2003	2.6	2.3	88.5
Sweden	2002	1.5	1.1	71.4
Switzerland	2001	...	0.9	...
United Kingdom	2003	0.7	0.6	83.6
Developing economies				
Brazil	2001	0.4	0.3	77.2
India	1999-2002	2.8	1.6	55.5

Source: IMF, *Government Finance Statistics Yearbook 2004* and national statistics.

2. THE INCIDENCE OF SUBSIDIES IN AGRICULTURE

(a) Introduction

This subsection on agricultural subsidies is divided into five main parts. The first is a discussion of the various policy objectives governments pursue in the agricultural sector. The second describes the available information and databases on domestic and export subsidies in agriculture. The third reports trends in subsidies to agriculture and the amounts spent by country and by commodity. The primary source is notifications by WTO Members. In an effort to go beyond a purely descriptive account of subsidies, the fourth part reviews some recent computable general equilibrium (CGE) simulations on the welfare effects of removing domestic and export subsidies on agriculture. The simulations allow us to compare the baseline – where subsidies to agricultural producers (importers or exporters) are provided – against the counterfactual, where all the subsidies are removed. The difference in the levels of welfare of countries between the baseline and the counterfactual reflects the incidence of subsidies in agriculture. Finally, some concluding thoughts are offered on the likely evolution of agricultural subsidies, given the trends discerned in this analysis and the outcome of the recent Hong Kong Ministerial Conference.

(b) Why do governments provide subsidies to agriculture?

Section D (Objectives of Subsidies) covered all of the important objectives of governments in providing subsidies. But there is no one objective discussed in that Section which fully explains the support that many governments have given to agricultural producers. Rather, it is a mix of those objectives that have motivated the provision of financial support – redistribution, income support, protection of the environment – plus a few others which are unique to the agricultural sector, such as food security and rural development. Also, the stated policy objectives do not appear to have remained the same but have tended to evolve over time, as witnessed, for example, by the growing weight now being put on the environmental value of agriculture.

Objectives may also vary by level of development. In developing countries, agricultural policy issues revolve around basic concerns like food security, poverty alleviation, rural development, and stabilization of export revenues. In developed countries, food self-sufficiency may continue to be important but increasing attention is being paid to food safety and environmentally sustainable farming. Agriculture and fisheries are expected to also provide a diversity of rural amenities and to contribute to community development (see Box 13 on the shared goals of OECD agriculture ministers).

To take a specific example of the evolution of an agricultural policy, consider the EU's Common Agricultural Policy (CAP). Initially, the principal objective of the CAP was to guarantee self-sufficiency in basic foodstuffs in response to post-war food shortages. The CAP was also seen as an early framework for intensified cooperation and integration among Member States of the European Community. The CAP was a production-oriented subsidy policy which lived on into the 1990s, by which time side-effects began to appear, such as mountains of beef and cereals. These were accompanied by increasing concerns about the environmental impact of the CAP and, indirectly, health scares such as Bovine Spongiform Encephalopathy (BSE), leading to increased dissatisfaction by consumers and taxpayers. The first major reform of the CAP was implemented in 1992 (under Agriculture Commissioner Ray MacSharry), setting in motion a process aimed at cutting guaranteed agricultural prices to render products more competitive, while at the same time compensating farmers for losses in income. The second major CAP reform was adopted as part of the Agenda 2000 package. Its main objectives are: increasing competitiveness of agricultural products; ensuring a fair standard of living for farmers; creation of substitute jobs and other sources of income for farmers; introducing a new policy for rural development (the second pillar of the CAP); more environmental and structural considerations; improvement of food quality and safety; simplification of agricultural legislation and decentralisation of its application. Following the Agenda 2000 reforms, another overhaul in 2003 sought to radically simplify the CAP with the amalgamation of different direct payment schemes into a single farm payment (SFP). Despite these reforms, the continued importance of the CAP is underlined by the fact that it consumes just under half of the EU's budget, although this figure is projected to be reduced to one-third in ten years (Leguen de Lacroix, 2004).

Box 14: Shared goals of OECD agriculture ministers

The expectations that developed countries have from their agricultural sector are perhaps best captured by the set of shared goals that the OECD agriculture ministers adopted in 1998:

- responsive to market signals;
- efficient, sustainable, viable and innovative, so as to provide opportunities to improve standards of living for producers;
- further integration into the multilateral trading system;
- provide consumers with access to adequate and reliable supplies of food, which meets their concerns, in particular with regard to safety and quality;
- contribute to the sustainable management of natural resources and the quality of the environment;
- contribute to the socio-economic development of rural areas; and
- contribute to food security at the national and global levels.

Source: OECD Council at Ministerial Level, April 1998, Ministerial Communiqués Related to Agricultural Policies.

However, there has been a change in perspective that is reflected in the reforms of the CAP. While farmers now have to comply with certain standards on public health, animal and plant health, the environment and animal welfare in order to receive full payment (cross-compliance), the market organizations for agricultural products remain targeted towards its primary objectives of market stabilization, securing the standard of living for farmers and increased productivity. Therefore, market organizations continue to fix indicative prices (at which transactions should take place), minimum threshold prices for imports and intervention prices below which authorities buy and store the quantities produced. They also grant aid to producers, in principle through single farm payments (SFPs), to be reduced progressively for large holdings until 2012, with the savings going to rural development policies. Currently, the EU also continues to refund producers who export to the rest of the world in order to bring their prices in line with world prices, but it has been acknowledged that the CAP should be less trade-distorting, taking particular account of the needs of developing countries (European Commission, 2005b; Leguen de Lacroix, 2004).

While developed and developing country governments may have different expectations from their agricultural sector, a number of them share a similar perception that market forces alone cannot achieve their policy goals and government intervention of one form or another, including the use of subsidies, have a role to play in meeting these policy objectives.

This discussion does not discount the role of political economy factors in explaining the amount of agricultural subsidies. OECD (2003a) holds that considerable disparities exist in the distribution of agricultural support depending on farm size, farm type (i.e. crops or livestock farmed) and region. With a large share of agricultural support in OECD countries being linked to the level of production or the level of input, it is not surprising that the largest farms, and often the most prosperous ones, are the main beneficiaries.

In the United States, the Environmental Working Group (EWG) discloses farm payment data on its website. Its "farm subsidy database" allows the user to extract disaggregated information by name of recipient, product or postal code. According to the EWG, the top 10 per cent of recipients (some 312,000 large farming operations, cooperatives, partnerships and corporations) collect over 70 per cent of farm support (on average more than US$33,000 per annum), while, in 2002, two-thirds of US farmers and ranchers received no direct government support.[177] Goodwin et al. (2004) have shown that a substantial part of the benefits from US farm support are captured by landowners through higher land values and higher lease rates. But most agricultural landowners (57 per cent) in the United States are non-farm corporations or individuals that work in or are retired from

[177] See http://www.ewg.org/farm/findings.php, visited on 23 February 2006.

non-farm-related activities. A significant proportion of landowners (15 per cent) live more than 150 miles from the land they rent. Almost half (42 per cent) of the landowners live in a city, town or urban area.[178]

Payment data for the CAP are provided by the European Commission (2002b), albeit at a highly aggregated level. The European Commission leaves the decision on whether to disclose detailed payment information and, if so, in what form to Member States and their national agencies that distribute CAP funding to receiving entities. If payments in excess of €5,000 are summed up over both the number of recipients and value, Table 10 indicates that on average in the EU (without Greece, for which insufficient data are available), 21 per cent of beneficiaries receive 82 per cent of direct payments. These numbers hide considerable detail. Oxfam (2005) identifies seven individuals in Spain, who as owners, majority shareholders or managers of agricultural enterprises and farms, received in 2003 as much money under the CAP (€14.5 million) as 12,700 small Spanish farms. Adding up support for a variety of operations, the study also calculates that one large company alone earned over €20 million in 2003 from CAP disbursements. Similarly, an Oxfam (2004) study of the cereals sector in England finds that CAP subsidies to a large extent benefit some of the wealthiest agricultural regions and biggest landowners. In spite of difficulties in obtaining information from the relevant authorities, they estimate that the largest 2.5 per cent of holdings account for around 20 per cent of total cereal subsidy payments, while the smallest 30 per cent receive less than 6 per cent of the total. Much will depend in the near future on how the SFP, which in theory is "decoupled" from production, will be implemented by national governments.

Table 10
Distribution of direct payments by recipient in the European Union (15)[a], 2000
(Percentages)

Payments in €	Share in total value	Share in total number of recipients
Up to 5,000	17.8	78.6
5 to 20,000	32.0	16.0
20 to 100,000	37.3	5.1
More than 100,000	12.9	0.3
	100.0	100.0

[a] Excluding Greece.
Source: European Commission (2002b), available at http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/02/198.

Following the "Freedom of Information Act" which entered into force in 2004, the rural payment agencies (RPA) of the United Kingdom published lists of the recipients of farm support in the UK (on 22 March 2005), which had not been accessible to the public until then.[179] While the data are now publicly available at a completely disaggregated level, namely by receiving entity, it is not easy to identify individual persons or enterprises that may collect payments made to several entities. Some have attempted to do so, focusing, for instance, on the Royal family.[180] Boulanger (2005) notes that, besides the United Kingdom and Spain (for which information is provided only by some regions), information on CAP disbursements by recipient are also publicly available in Denmark and, upon request, in Sweden. According to this study, the Dutch Government has committed to follow suit, and campaigns in other Member States, such as Finland, Germany, Greece and Poland, to release CAP payment data to the public have been launched. Countries like Belgium or Estonia provide partial information, such as lists of beneficiaries without disclosing the amounts received.[181]

(c) Main sources of data on agricultural subsidies

In this subsection, the two main sources of information on agricultural subsidies which are used in this Report are described. These are the notifications made by WTO Members to the WTO Committee on Agriculture and the OECD's agricultural database, particularly its Producer Support Estimate (PSE). Since there are only 30 member countries of the OECD while the WTO currently has 149 Members, information from the WTO

178 USDA (1999) and Mishra et al. (2002).

179 See http://www.rpa.gov.uk/rpa/index.nsf/vContentByTaxonomy/F0D124030D4B3EA78025703E00357979?OpenDocument, visited on 1 February 2006.

180 See, for instance, http://image.guardian.co.uk/sys-files/Guardian/documents/2005/03/23/CAP.pdf, and http://www.freedominfo.org/case/cap/index.htm, both websites visited on 1 February 2006.

181 For an evaluation of the degree to which the 25 Member States of the EC have released CAP payment data see also http://www.farmsubsidy.org, visited on 24 February 2006.

notifications should be more comprehensive. But since most agricultural subsidies is provided by OECD Members, the same set of countries figure prominently whichever source of information is used.

While it is always possible to look for information on agricultural subsidies from individual countries, there are several drawbacks. Firstly, the data collected may not be comparable between countries because different classifications or definitions are used. Second, the data needed should be easily linked to the economic concepts that will inform the discussion in this report. For these reasons, the OECD database and WTO notifications are deemed the most suitable for the task at hand.

(i) WTO and OECD data on agricultural subsidies

Many refer to the OECD's producer support estimate or PSE when they quantify the amount of subsidies given by rich countries to their agricultural sector. One possible reason for this is the fact that WTO Members have not provided timely notifications of their agricultural subsidies, while OECD data on producer support tends to be up-to-date and easily available. In 2004, the PSE was about US$280 billion. However, the PSE includes more than the financial outlays made by governments to support their farmers, or foregone revenues; it includes the transfers from domestic policies and border measures (e.g. tariffs and export subsidies) that create a wedge between border and domestic prices. For these and other reasons to be discussed in more detail below, the WTO estimate of the most trade-distorting subsidies, as measured by the aggregate measurement of support (AMS), does not correspond to the OECD calculation of PSE even with the same set of countries.

These two measures of support to agricultural producers arose for different reasons. In the case of the WTO, it was from a desire by Members to reform their agricultural policies and to have the necessary instruments to monitor the implementation of legally binding commitments. The AoA refers to the "long-term objective" of providing "for substantial progressive reductions in agricultural support and protection sustained over an agreed period of time, resulting in correcting and preventing restrictions and distortions in world agricultural markets". This reform process entailed binding commitments in three policy areas – market access, domestic support and export competition.[182] In the case of the OECD, the estimates are used as the basis for the organization's annual monitoring and evaluation of the implementation of the principles for agricultural policy reform agreed to by the OECD Ministers (see Box 13 for the OECD agricultural reform principles).[183] The OECD methodology estimates the annual monetary value of gross transfers arising from policy measures which support agriculture. The methodology distinguishes between those (gross) monetary transfers granted to individual producers (PSE), transfers paid by or benefiting consumers (Consumer Support Estimate or CSE) and transfers granted to the sector as a whole (General Services Support Estimate or GSSE).

These differences in objectives have produced alternative ways of measuring support to the agricultural sector. What is crucial in the WTO context is the distinction between support that is considered trade-distorting and support that is considered less or non-trade distorting. Under the AoA, the most trade-distorting support is to be subject to reduction commitments, while other support measures are to be subject to greater discipline. Hence, the various categorizations or "coloured boxes" that were developed during the Uruguay Round negotiations which were intended to reflect this distinction.

Those subsidies considered to be the most trade- and production-distorting are subject to reduction commitments by WTO Members and these are expressed in terms of total Aggregate Measurement of Support (AMS). These measures are sometimes described as *Amber Box Measures*. The main components of AMS are: (i) market price support as measured by the gap between a fixed world reference price fixed in terms of a historical base period (1986-88) and the domestic administered price (which may not be the same as the current domestic market price); and (ii) the level of budgetary expenditure on domestic support policies that is considered to be trade distorting. The AMS is to be calculated both on a product-specific and a non-product-specific basis. It is to include both budgetary outlays and revenue foregone by governments or their agents at both the national

[182] The AoA also included reference to "reaching an agreement on sanitary and phytosanitary issues", which suggests that WTO Members were equally concerned with SPS measures as possible non-tariff barriers.

[183] However, as Diakosavvas (2002) recounts, the Uruguay Round negotiations also provided part of the drive for the OECD to develop measures of support to the agricultural sector.

and sub-national level. There is, nevertheless, a *de minimis* level of product-specific and non-product-specific domestic support, which a Member is allowed to retain. For product-specific (non-product-specific) support, the *de minimis* level is equal to 5 per cent of the value of production of a basic agricultural product (value of total agricultural production) for developed countries and 10 per cent for developing countries. Annex 3 of the Agreement on Agriculture provides a set of detailed guidelines for calculating a Member's AMS.

However, there are a range of support measures that are not subject to reduction commitments. These include:

Green Box Measures. These are domestic support measures that have no, or at most minimal, trade-distorting effects or effects on production. These measures include expenditures for general government services, public stockholding for food security purposes, domestic food aid, direct payments to producers, decoupled income support, government financial participation in income insurance and income safety-net programmes, payments for relief from natural disasters, structural adjustment assistance, payments under environmental programmes and under regional assistance programmes. The basis for exemptions from the reduction commitments are spelled out in greater detail in Annex 2 of the AoA.

Blue Box Measures. Payments under production-limiting programmes are not subject to reduction commitments if such payments are based on fixed area and yields, or are made on 85 per cent or less of the base level of production or in the case of livestock payments, are made on a fixed number of head.

Article 6.2 Measures (Development Programmes). Exempt from domestic support, reduction commitments are direct or indirect measures of assistance to encourage agricultural and rural development; investment subsidies which are generally available to agriculture in developing countries; agricultural input subsidies generally available to low-income or resource-poor producers in developing countries and domestic support to producers in developing countries to encourage diversification from growing illicit narcotic crops.

In the OECD methodology, the PSE is not intended to be solely a measure of "domestic support". It is a measure of the additional receipts of farmers, irrespective of whether those receipts are a consequence of border measures or of domestic policies. Thus, the PSE includes transfers created by domestic policies which increase prices in domestic markets such as public stockholding, production quotas and state-trading enterprise, as well as the transfers associated with border measures that create a gap between current domestic and external prices.[184] One multiplies this price gap with all of domestic production to obtain the transfers associated with market price support. This represented about 60 per cent of the PSE in 2004.

Even under the WTO's three-pronged reform process (domestic support, market access and export competition), it is not always possible to fully disentangle domestic support from the effects of border measures.[185] In the case of the AMS for example, the market price-support component is calculated using the gap between a fixed external reference price and the applied administered price multiplied by the quantity of production eligible to receive the applied administered price. This fixed external reference price is based on the years 1986 to 1988 and is generally the average f.o.b. unit value of the commodity. So market price support in the AMS is calculated using a different set of prices, only for products which have administered prices, and the price gap is applied to a subset of domestic production.

While this choice of reference price may appear difficult to understand, there is an explanation for it which dates back to the purpose of the AMS, which is to make it possible for WTO Members to make legally binding commitments to reduce domestic distortions. The intention of the AoA is not necessarily to show the actual value of market price support in a given year of implementation, but to see how the support compares with

[184] One point that could be made about using the gap between the domestic and the border price to calculate market price support in the PSE is that it may be picking up the effects of other factors that are not related to agricultural policies in general. These other factors could include market power by domestic firms in the agricultural marketing system, or the effects of SPS measures, and it is not clear if the OECD includes these as part of the set of agricultural policies whose effects on gross transfers to producers need to be accounted for.

[185] See Baffes et al. (2005) for some critical analysis of the AMS along these lines. Their criticisms include "the use of arbitrary world and domestic reference prices, and double counting with border protection".

the base period and the commitments established on the basis of the base period. The use of external prices that refer back to the base period reflects the fact that there is no way of predicting external prices nor of controlling them, and WTO Members were not going to be asked to make commitments that they could not keep.

To summarize, the AMS would in general be a narrower measure than the PSE because it restricts itself to the most trade-distorting form of support. Compared to the PSE, the market price support component of the AMS uses a different set of prices, is applied only to a subset of commodities (only to those with administered prices) and to a smaller volume of domestic production (only to production eligible to receive the applied administered price). One should expect, then, the estimates of market price support in the AMS to be frequently lower than in the PSE.[186]

The AoA requires WTO Members to notify the Committee on Agriculture on expenditures related to domestic support and the volume and value of export subsidies. The AoA also requires any new domestic support measure, or modification of an existing measure, for which exemption from reduction commitments is claimed, to be notified. The notifications provided by WTO Members, organized along the lines described in Box 15 below, will be used in the presentation on the incidence of agricultural subsidies.

Box 15: WTO notifications of agricultural subsidies under the AoA

Domestic Support - DS:1 notification, Current Total AMS

The DS:1 notification, Table DS:1, indicates a Member's current AMS support against its bound commitment level (i.e. bound AMS). It also includes a number of supporting tables which set out expenditures under the green box, the blue box as well as the composition of the amber box (i.e. AMS). These supporting tables are organized along the following lines :

- Supporting Table DS:1 is used to signify measures which Members have placed in the green box of measures exempt from reduction as defined in Annex 2 of the AoA.
- Supporting Table DS:2 is used to signify those measures which, for developing countries, are exempt from reduction commitments under Article 6.2 of the AoA relating to development programmes.
- Supporting Table DS:3 is used to signify direct payments under production-limiting programmes (blue box measures) under Article 6.5 of the AoA.
- Supporting Tables DS:4 to DS:9 are used to signify measures which do not fit into the exempt categories as set out above. These tables are used to indicate non-exempt support which is below the *de minimis* level (as set out in Article 6.4 of the AoA), or which is included in the Total AMS of the Member concerned. The figures include market price support (Supporting Table DS:5), non-exempt direct payments (Supporting Table DS:6), other product-specific support (Supporting Table DS:7) plus any support measured via the Equivalent Measurement of Support methodology (Supporting Table DS:8) for each product concerned. Where relevant, a total of non-product-specific support (Supporting Table DS:9) is also given. It should be noted that all products shown in Members' notifications are included in this section whether or not that support is below the relevant *de minimis* level for the Member concerned.

[186] However, there are instances when this is reversed, as it depends on whether the difference between current market prices and the administered prices is higher than the difference between the border prices used in the MPS calculations and the 1986-88 fixed reference prices used in the MPS of the AMS (see Table 4 in Diakosavvas, 2002).

Domestic support - DS:2 notification - new or modified exempt measure

- A DS:2 notification is used for all new or modified support measures for which an exemption from reduction commitments is claimed (i.e. for a measure falling under either the green box, Article 6.2, or the blue box).

Export subsidies - ES:1 to ES:3:

- Table ES:1 is used to indicate budgetary outlay and quantity reduction commitments as well as actual outlays and quantities of subsidized exports. These commitments are on a per product basis. The products and groups of products used for the establishment of export subsidy reduction commitments were based on document MTN.GNG/MA/W/24 and, in relation to total exports, on document G/AG/2.

- Supporting Table ES:1 is used to indicate actual budgetary outlays and quantities.

- Supporting Table ES:2 is used for developing countries which make recourse to Article 9.4 of the AoA, which permits these Members to use export subsidies in respect of reducing marketing costs, including handling, upgrading and other processing costs, as well as internal and international transport costs.

- Table ES:2 is used to notify the volume of total exports of all Members with export subsidy commitments and of those Members considered to be significant exporters in accordance with G/AG/2/Add.1.

- Table ES:3 is used to notify the total volume of food aid donations.

Each WTO Member needs to meet specific criteria in order to place a subsidy in the green box, blue box and as part of Article 6.2 measures. In addition, how a Member classifies a subsidy measure is not safe from legal challenge. Other WTO Members can dispute the classification and the support measure can be the subject of a dispute settlement case (see Box 16).

Box 16: Challenging notifications of agricultural subsidies

How each Member notifies its agricultural subsidies to the Committee on Agriculture can often be the subject of a serious challenge by other Members. In some cases, it can be part of a dispute settlement proceeding. In the case of *United States-Upland Cotton* (DS267), for example, the classification of a number of US measures was challenged by Brazil.

The United States had notified payments under its Direct Payments (DP) programme and, before that, payments under the production flexibility contract (PFC) as decoupled payments belonging to the green box. The DP programme was established by the US Farm Security and Rural Investment (FSRI) Act of 2002. It provides support to producers for nine commodities, including upland cotton. The amount of payments were not based on actually planted acreage but on "base acreage", which was calculated based on the average of past plantings, primarily (but not exclusively) during the 1998 through 2001 crop years. Further, the DP payments do not depend on current prices of commodities; rather the FSRI Act sets fixed payment rates on a per unit basis for the 2002 through 2007 crop years.

Many features of the programme thus were consistent with decoupled payments as described in Annex 2 of the AoA. In particular, the income support was determined based on factors that occurred during the base period. However, while producers were permitted to plant any commodity or crop on base acres, payments were either eliminated or reduced if they planted fruits and vegetables on base acres,

although with certain exceptions. Because of this feature of the programme, the Panel found that support under the DP (and the PFC) was related to the type and volume of production undertaken by the producer in a year after the base period. The Panel concluded that the DP (and PFC payments) were not decoupled payments and were thus not green box measures. However, the Panel did not find that these measures resulted in serious prejudice to the interests of Brazil.

Another US measure which was challenged was user marketing (step 2) payments on cotton. This was a special marketing loan programme for upland cotton which provides for the issuance of marketing certificates or cash payments to eligible domestic users and exporters of eligible upland cotton when certain market conditions exist, such that US cotton pricing benchmarks are exceeded. The United States had reported the benefits conferred under the programme as product-specific amber box domestic support. Also, it did not list any scheduled commitments on export subsidies on upland cotton. In the dispute, Brazil argued that the payments under the programme were prohibited export subsidies. The Panel concurred with Brazil and found that step 2 payments to exporters constituted an export subsidy (was "contingent on export performance"). Step 2 payments to domestic users were found to be an import substitution subsidy prohibited by the Subsidies and Countervailing Measures Agreement. The US Congress has since approved legislation to eliminate Step 2 payments and the US President has indicated his intention to sign such legislation into law.

Source: WTO document WT/DS267/R.

(ii) Comparing different data sources

Any figure on subsidies is subject to specific reporting standards, so using data derived from dissimilar sources can give quite divergent pictures. These differences in standards make comparisons difficult and make it almost impossible to add up numbers from different sources. Even if definitions are compatible, merging certain aggregates carries the risk of double-counting due to inclusions or exclusions of specific components.

In the following discussion, the estimated amounts of subsidies from different official sources will be compared to see if they differ widely or not. The possible reasons for these differences will be explored and consideration given to some of the pitfalls that can arise from using one measure of subsidies without taking into account how it is defined and how that measure is intended to be used. To provide some concreteness in the discussion, two specific examples – the United States and the European Union – will be employed.

The case of the United States

Table 11 brings together information on US agricultural subsidies for the period 1995-2001 from three different sources of data: the US national income accounts, US notifications to the WTO and the OECD agricultural database. According to the US national income accounts, federal spending on agricultural subsidies averaged US$14.2 billion over the 1995-2001 period. On the other hand, current total AMS averaged US$10.9 billion during the same period while total domestic support, which is the sum of AMS, *de minimis*, blue box and green box measures, averaged US$ 66.2 billion. The average for the OECD's PSE was US$40.9 billion. Additional information on the GSSE (which averaged about US$65.4 billion) is also included in Table 11.

Table 11
United States' agricultural subsidies by data source, 1995-2001
(Million dollars)

Source	1995	1996	1997	1998	1999	2000	2001	Average 1995-2001
National income accounts [a]	**7279**	**7340**	**7495**	**12380**	**21513**	**22896**	**20727**	**14233**
Total Domestic support [b]	**60770**	**58899**	**58302**	**64962**	**74046**	**74200**	**72130**	**66187**
AMS	6214	5898	6238	10392	16862	16803	14413	10974
Market price support	6161	5898	5773	5956	6216	6686	5849	6077
De minimis	1485	1176	811	4750	7435	7341	7045	4292
Blue box	7030	0	0	0	0	0	0	1004
Green box	46041	51825	51252	49820	49749	50057	50672	49917
Domestic food aid	37470	37834	35963	33487	33050	32377	33916	34871
OECD PSE [c]	**20180**	**28963**	**29768**	**46144**	**55942**	**53670**	**51838**	**40929**
Market price support	9147	14382	13977	21249	21643	18762	19066	16889
Payments based on output	67	58	330	4251	10517	10226	9355	4972
Payments based on area planted/animal numbers	2470	699	192	2851	2818	3510	2862	2200
Payments based on historical entitlements	0	5186	6286	8470	10939	10530	8739	7164
Payments based on input use	6002	6090	6056	6116	6633	6986	7534	6488
Payments based on input constraints	1940	1963	1902	1954	1808	1778	1918	1895
Payments based on overall farming income	554	584	1026	1252	1585	1877	2364	1320
Miscellaneous payments	0	0	0	0	0	0	0	0
OECD GSSE [c]	**26459**	**25757**	**24739**	**22840**	**23328**	**22902**	**25126**	**24450**

Source:

[a] US Department of Commerce, Bureau of Economic Analysis: detailed national accounts data on website.

[b] WTO notifications by the United States: G/AG/N/USA/10, G/AG/N/USA/17, G/AG/N/USA/27, G/AG/N/USA/36; G/AG/N/USA/43 and G/AG/N/USA/51.

[c] Producer and Consumer Support Estimates: OECD Agricultural database, 1986-2004.

Let us first try to account for the difference in the subsidy figures based on the US national income accounts and the WTO and OECD. Some of the difference can be explained by the fact that the US fiscal year (1 October to 30 September of the following year) is different from the agricultural marketing year, which in turn varies by commodity. To control for that, the average of the figures for the whole period is included in the last column of the table. The use of the average over the whole period should dampen any problem arising from the difference in fiscal and marketing years.

However, the magnitude of the gaps among the three measures is not affected at all. The subsidy figures from the national income accounts tend to be smaller because they only reflect financial outlays. They do not reflect foregone revenues nor do they include the support that comes from the use of border measures (mainly through market price support). Finally, US domestic food aid, which is included in the green box and which averaged nearly US$34.9 billion annually during the period, would not be considered an agricultural subsidy in the national income accounts but a form of social payment or benefit.[187]

Next, let us turn to the comparison of the WTO and OECD numbers, focusing on the difference between the AMS and the PSE. Table 11 shows that market price support in the AMS averaged about US$6.1 billion during the 1995-2001 period, while market price support in the PSE was about three times higher, at US$16.9 billion. This is consistent with the expectation that the estimates of market price support in the AMS would frequently be lower than in the PSE. In the US case, administered prices are applied only to four commodities: beef and veal, dairy, peanuts and sugar. On the other hand, the principle underlying calculation of market price support in the PSE is that this should be calculated for all commodities (although if the domestic price does not exceed the border price, the calculated support would be zero). In practice, what happens is that market price support is first calculated on a set of "MPS commodities", which varies by country. In the case of the United States, these "MPS commodities" are

[187] See the discussion of subsidy figures from the national income accounts at the beginning of Section E.

wheat, maize, barley, sorghum, rice, soybean, sugar, milk, beef and veal, sheep meat, wool, pig meat, poultry, and eggs. The calculated MPS average for these commodities is then applied to all commodities (i.e. to the total value of production of the whole agricultural sector) according to their share in the value of production (OECD, 2005e). Finally, in order to obtain the market price support in the AMS, one needs to multiply the difference between the fixed reference price and the administered price with the volume of eligible production only.

As was noted above, US domestic food aid is included in the green box and represents nearly 70 per cent of green box spending. The OECD includes many of the US food aid programmes in its Consumer Support Estimate (CSE), not in the PSE nor in the GSSE, since the programmes are seen as a transfer to consumers.[188] Given the differences in calculating market price support and what goes into the green box, a better way to compare the WTO and OECD measures might be to take total domestic support (less market price support and green box spending) and compare it with the PSE (less market price support). Unfortunately, there is still a large gap between the two. Over the 1995-01 period, the PSE (less market price support) exceeded total domestic support (less market price support and the green box) by an average of about US$17.7 billion.

Finally, a fourth source of information on US agricultural subsidies are the notifications under the Agreement on Subsidies and Countervailing Measures (SCM). Article 25.2 of the SCM requires Members to notify any specific subsidy which they grant or maintain. Typically the notifications would include subsidies provided to the agricultural sector. The SCM notifications of the United States pertaining to agriculture included both export and domestic assistance measures. However, using these notifications, the latest year for which it is possible to paint a complete picture of US agricultural subsidies was fiscal year 1999.[189] Export assistance measures (the Export Enhancement Programme and the Dairy Export Incentive Programme) for fiscal year 1999 amounted to US$137.9 million. The domestic assistance measures included information on outlays and estimates of tax revenues foregone. Outlays on domestic assistance measures in fiscal year 1999 amounted to US$21.3 billion, mainly for spending on the production flexibility contracts (US$5.476 billion), emergency supplemental income support for PFC contract holders (US$5.466 billion) and non-recourse marketing assistance loans and loan deficiency payments (US$8 billion). The total figure for tax revenue foregone was about US$800 million, the bulk of it from capital gain treatment of certain agricultural income. So if one only takes total outlays on export and domestic assistance measures to the agricultural sector in fiscal year 1999, the sum (US$21.452 billion) is very close to the figure from the national income accounts in Table 11 (US$ 21.513 billion).

The difference in definitions, concepts and objectives underpinning the various measures make cross comparisons fraught with difficulty. Nevertheless, this is precisely what has been tried in this part of the Report so as to account for some of the major differences in estimates. Ultimately, the choice of the measure should be driven by the purpose to which it is to be put. If the intention is to determine how much in total a Member spends per fiscal year on agricultural subsidies, regardless of whether that support distorts trade or not or whether it is decoupled or not, then the national income account data is appropriate. If the intention is to determine how WTO Members are implementing their commitments to reduce the most trade-distorting domestic support, then the AMS is the most appropriate. If the intention is to estimate the receipts of agricultural producers arising from the implementation of government policies to support the agricultural sector, then the OECD PSE is appropriate.

That being said, and despite wide differences in the numbers that come from these different sources of subsidy information, the trends that emerge from Table 11 are nevertheless consistent. Whatever source of subsidy information one uses, it shows that US support of its agricultural sector has increased between 1995 and 2001. Based on national income account information, that support has risen threefold, and based on the OECD PSE, it has more than doubled. The increase in the WTO's total domestic support has been less pronounced, just a 20 per cent increase over the six-year period. But the bulk of the increase has been in the AMS and *de minimis*, a pattern which is also mirrored in the OECD's PSE, by the doubling of market price support and the sharp rise of output-based payments.

[188] The major domestic food aid programmes included are the food stamp program, child nutrition programs and the Special Supplemental Nutrition Program for Women, Infants, and Children.

[189] See WTO notifications G/SCM/N/48/USA, G/SCM/N/60/USA and G/SCM/N/71/USA issued on 2 July 2002 and G/SCM/N/95/USA issued on 31 October 2003.

The case of the EU

In order to gain a sense of the degree of agricultural subsidization in the European Union (EU), for instance, one could turn to a variety of sources. A natural starting point would be the EU's own statistics on CAP spending, in particular the annual "Financial Reports on the European Agricultural Guidance and Guarantee Fund (EAGGF)" (European Commission, 2004a). The EAGGF, set up specifically for the financing of the common agricultural policy (CAP), consumes a large part of the EU's general budget. The Fund's guarantee section, its larger part, covers expenditure on the "agricultural market organisations", i.e. on individual product markets. It includes both export refunds and intervention expenditure, consisting mainly of direct aid, storage and withdrawals. It also provides for special financing, notably of certain rural development measures, veterinary expenditure and information measures relating to the CAP. The Guidance Section finances other rural development expenditure. Information for the latter can be found in the EU's general budget under "Structural Funds", since its main purpose is to contribute to reducing disparities between the different regions.[190] In the 2001 fiscal year,[191] the EU spent €42,083 million under the Guarantee and €2,502 million under the Guidance Section, amounting to a total of €44,585 million.

These Community Funds are made available by the EC Commission to "paying agencies" in the individual Member States for distribution to beneficiaries. In addition, each country, on its own account, provides state aid, including in the area of agriculture. As mentioned earlier in Section B on the definition of subsidies, state aid is understood to confer an economic advantage to recipients and, hence, to have the potential to distort competition and trade in the EU's internal market. For that reason, state aid is monitored by the Commission in accordance with Article 87(1) of the EU Treaty. State aid rules in the agricultural sector, in addition to the general principles of competition policy, have to be coherent with the CAP and with rural development policies and in accordance with WTO obligations, in particular the AoA. Reporting requirements in the agricultural sector are particularly strict, comprising all support granted at the national and sub-national levels in terms of direct payments, reductions of input costs and general services as well as transfers supporting agro-environmental programmes and other payments relating to the "multifunctional" character of agriculture. Some of the competition rules on state aid, in particular the *de minimis* exceptions, do not apply to agriculture. According the "Scoreboard" available on the EU website, state aid in agriculture amounted to €13,040 million in 2001 across all Member States.[192] If this figure is added to Community outlays, total spending by the EU and its Member States on agriculture amounted to €57,625 million in the 2001 fiscal year.

This number differs both from the subsidy amounts notified to the WTO under the AoA and from the support calculated by the OECD. The latter provides by far the highest subsidy estimate. The PSE alone amounts to €93,061 million in 2001. If transfers from taxpayers to consumers (from the Consumer Support Estimate (CSE)) and the General Services Support Estimate (GSSE) are added, total support equals €105,899 million.[193] The GSSE comprises payments for general agricultural services, such as public stockholding, veterinary and plant inspections and marketing and promotion that, in general, are also covered by the CAP and state aid budgets. The large difference between OECD estimates and total spending in the EU must then principally be due to the PSE. As explained above, the PSE is a measure of all current additional receipts by farmers. In particular, its market price support component is calculated on the basis of current domestic and border prices. Transfers due to tariffs and higher consumer prices, for instance, do not lead to government expenditures and, hence, do not feature in Community and Member State budgets.

190 Statistics on the Guidance Section have been taken from the EU's Online Budget under Title B2-1, Subtitle B2-100 Structural Funds, EAGGF, Guidance Section. Available at http://europa.eu.int/eur-lex/budget/data/D2003_v4/EN/AAHPB_frm.htm, visited on 20 December 2005.

191 For comparison purposes, the year 2001 is chosen, since it is the latest date for which the EU has notified its domestic support under the AoA.

192 Available at http://europa.eu.int/comm/competition/state_aid/scoreboard/indicators/stats1, visited on 20 December 2005. The official statistics on the EU state aid scoreboard website are expressed in constant 2003 € millions. In order to obtain current 2001 values, the Eurostat Harmonised Index of Consumer Prices (HICP) for the EU-15 was used as an indicator of inflation. Available at http://epp.eurostat.cec.eu.int/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=EU_MAIN_TREE&root=EU_MAIN_TREE/economy/main/overview/yearlies/B2/B21/dba10000, visited on 20 December 2005.

193 This so-called total support estimate (TSE) by the OECD measures the overall cost of agricultural support financed by consumers and taxpayers net of import receipts. See Producer and Consumer Support Estimates, OECD Database 1986-2004. Available at http://www.oecd.org/dataoecd/44/5/35043954.xls. See also OECD (2005f).

A similar caveat applies to the total subsidy amount notified to the WTO under the AoA, which in 2001 stood at €87,075 million (sum of domestic support and export subsidies).[194] Again, the PSE market price support component captures all factors that contribute to the price gap between current market prices and the higher prices received by producers, i.e. border measures, such as tariffs and export subsidies, as well as transfers created by domestic policies, such as public stockholding, production quotas and state-trading enterprises, which increase the price in the domestic market. Several of these elements are not included in the methodology used under the AoA to assess compliance with reduction commitments. Perhaps even more importantly, OECD PSE calculations are based on current prices, and the price wedge between current domestic market prices and world prices at the border is likely to differ from the difference between administered prices and the 1986-88 fixed reference prices used in the market price support calculations for the purposes of the AMS under the AoA.

Table 12
European Union (15) agricultural subsidies by data source, 1995-2001
(Million euros)

Measure	1995	1996	1997	1998	1999	2000	2001	Average
EAGGF, Guarantee Section[a]	**34503**	**39108**	**40675**	**38748**	**39541**	**40467**	**42083**	**39304**
State aid[b]	**16696**	**16395**	**16537**	**14054**	**14823**	**14122**	**13568**	**15171**
Total domestic support[c]	**90476**	**95422**	**89347**	**86733**	**89994**	**88286**	**84502**	**89251**
AMS	50026	51009	50194	46683	47886	43654	39281	46962
De minimis	825	761	543	379	400	561	833	615
Blue box	20845	21521	20443	20504	19792	22223	23726	21293
Green box	18779	22130	18167	19168	21916	21848	20661	20381
Total export subsidies[c]	**4885**	**5565**	**4361**	**5336**	**5614**	**2763**	**2573**	**4442**
OECD PSE[d]	**96779**	**93199**	**95318**	**100917**	**107173**	**93338**	**93061**	**97112**
Market price support	58492	52284	54012	61923	68750	52768	48819	56721
Payments based on output	1758	3283	3473	3336	3328	4041	4186	3344
Payments based on area planted/animal numbers	24200	25871	24927	25235	24386	26093	28302	25573
Payments based on historical entitlements	1772	977	864	715	616	627	591	880
Payments based on input use	6608	7036	7987	7013	7326	7089	7324	7197
Payments based on input constraints	2979	3873	4884	3182	3310	3714	3944	3698
Payments based on overall farming income	0	0	3	1	0	0	0	1
Miscellaneous payments	970	-125	-833	-487	-544	-993	-105	-302
OECD GSSE[d]	**6729**	**8829**	**11581**	**8973**	**9594**	**8549**	**9162**	**9060**

Source:

[a] European Commission, DG Agriculture, 31st Financial Report - EAGGF Guarantee Section – 2001, COM (2002) 594 final, available at http://europa.eu.int/comm/agriculture/fin/finrep01/tab_fr/a10.pdf, visited on 9 December 2005.

[b] European Commission, DG Competition, State Aid Scoreboard, available at http://europa.eu.int/comm/competition/state_aid/scoreboard/indicators/k9.html#stats1, visited on 7 December 2005.

[c] WTO notifications by the European Communities to the Committee on Agriculture: G/AG/N/EEC/5/Rev.1, G/AG/N/EEC/11, G/AG/N/EEC/20/Rev.1, G/AG/N/EEC/23, G/AG/N/EEC/32, G/AG/N/EEC/36 and G/AG/N/EEC/44 (export subsidies); G/AG/N/EEC/12/Rev.1 and Corr.1, G/AG/N/EEC/16/Rev.1, G/AG/N/EEC/26 and Corr.1, G/AG/N/EEC/30 and Corr.1, G/AG/N/EEC/38 and Corr.1, G/AG/N/EEC/49 and Corr.1 and G/AG/N/EEC/51 and Corr.1

[d] Producer and Consumer Support Estimates, OECD Agricultural Database 1986-2004, available at http://www.oecd.org/dataoecd/44/5/35043954.xls, visited on 7 December 2005.

Community and state aid outlays are also incongruent with the amounts notified to the WTO. The Current Total AMS calculations of the value of domestic support provide for a common concept used to assess compliance with the legal commitment not to exceed the Final Bound Total AMS set out in Members' Schedules.[195] Its objective is not to allow for an economic assessment of the value of current support. As mentioned above, market price support[196] is calculated from the gap between the applied administered price and a fixed external

194 See WTO notifications G/AG/N/EEC/51 and G/AG/N/EEC/52.

195 However, the precise methodology may vary from Member to Member but each Member has to use the same methodology that it used in preparing its supporting data or, if a new support programme is introduced, the methodology set out in Annexes 3 and 4 of the AoA.

196 For the purposes of AMS, a Member may even choose to calculate certain direct payments in this manner, which are dependent on a price gap, instead of using budgetary outlays. See AoA Annex 3, para. 10.

reference price. Since the latter is based on the years 1986 to 1988,[197] current total AMS levels determined in this way cannot be interpreted as actual subsidy values, particularly for price or market support programmes. Table 12 provides an overview of the EU support data from different sources.

As noted before, Members are required to notify agricultural subsidies not only under the AoA, but also under the SCM Agreement. For 2001, the EU notified all price support measures and direct payments introduced by the common market organisations. State aid by individual member states is notified separately as addenda to the EU's notification. Payments for general services and rural development seem to be excluded, as they do not constitute "specific" subsidies. The financing of export refunds in 2001 amounted to €3,404 million and of measures on the internal market to €33,873 million resulting in a total of €37,277 million.[198] The notification under the SCM Agreement relies on EAGGF data and one would therefore expect a certain correspondence to the EAGGF report. This seems to be the case, with total EAGGF spending equalling about €38 billion in 2001, excluding rural development. If general services, such as veterinary and phytosanitary measures are subtracted, the amount roughly coincides with the €37 billion notified under the SCM Agreement. If broken down at the product level, the data from both sources are identical for most, but not all agricultural products. For instance for sugar and dairy products, it is hard to reconcile the data despite the additional expenditure breakdown or explanations given in either the SCM notification or EAGGF report.

Table 13
Notification by the EU under the AoA (Table ES:1) and the SCM Agreement (pursuant to GATT Art. XVI and SCM Art. 25) of export refunds, 2001
(Million euros)

Agreement on Agriculture (AoA)		SCM Agreement	
Product	Value	Product	Value
Wheat and wheat flour	8.5	Arable crops	259.8
Coarse grains	112.8		
Rice	30.3	Rice	38.7
Rapeseed	0.0		
Olive oil	0.0	Olive oil	0.2
Sugar	482.8	Sugar	1008.2
Butter and butter oil	324.9	Dairy products	1106.5
Skimmed milk powder	36.7		
Cheese	188.6		
Other milk products	402.2		
Beef meat	388.4	Beef meat	362.6
Pig meat	20.0	Pig meat	55.2
Eggs	6.0	Eggs and poultry	60.5
Poultry meat	60.2		
Wine	22.9	Wine	22.5
Fruit and vegetables, fresh	20.8	Fruits and vegetables	50.8
Fruit and vegetables, processed	3.6		
Raw tobacco	0.0		
Alcohol	52.8		
Incorporated products	411.6		
		Non Annex I Products	438.8
Total	2573.1	Total	3403.8

Source: WTO Secretariat.

What about the consistency of AoA and SCM notifications? At least for export subsidies, one would expect a match between the EAGGF and SCM data on the one hand and the amounts notified under the AoA on the other, since export subsidies largely refer to actual disbursements. Table 13 compares the amounts

197 In fact, the external reference price is generally determined as the average f.o.b. unit value for the basic agricultural product concerned in a net exporting country and the average c.i.f. price unit value in a net importing country in the base period 1986 to 1988.

198 See WTO notification G/SCM/N/95/EEC.

notified under the AoA and the SCM Agreement on a disaggregated basis. It has to be presumed that the discrepancies for almost all product categories may be explained, to a large extent, by the different time periods for which account is given. While under the AoA, the 2001 notification specifies marketing years for each product beginning anywhere between 1 July of 2001 and 1 January 2002, the EAGGF data used for the SCM notification refers to the 2001 financial year lasting from 16 October 2000 to 15 October 2001. Also, totals differ, given that in the SCM notification, disbursements for products are detailed that are not included in AoA Annex I, containing the list of agricultural products covered by the AoA.

(d) The incidence of domestic support

The analysis starts with the most trade-distorting domestic support, total AMS, which is subject to reduction commitments under the AoA. Thirty-six WTO Members have total AMS commitments.[199] Annex Table 3 lists all WTO Members with such commitments and shows their Final Bound Total AMS and the relevant year in which it came into force. For developed countries this was in 2000 and for most developing countries, the year was 2004. For some recently acceded Members, the year that the final bound total AMS comes into force differs from 2004. For example, in the case of Chinese Taipei, the year is 2000. It is important to note that commitments are in nominal terms and not in real terms, although some Members may have stated such commitments in a foreign currency (US dollars, ECU) or in Special Drawing Rights (SDRs) rather than in local currency terms. If one uses the relevant exchange rates to the US dollar as of year 2004, the Final Bound Total AMS of the 36 Members amounts to US$170.1 billion.

(i) Trends in current total AMS and domestic support

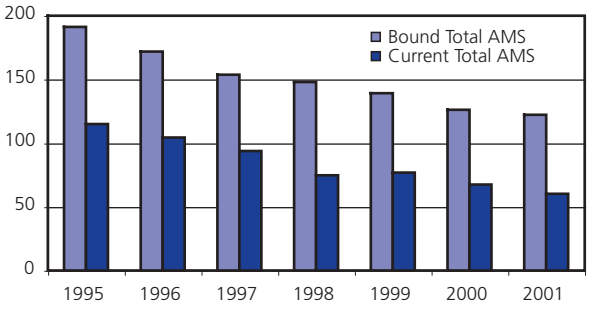
Notifications by WTO Members have tended to lag by several years, making it difficult to provide the latest information on Current Total AMS. Further, not all Members have notified every year since 1995, so there are gaps in the data. This lack of timely reporting represents an important constraint to up-to-date and relevant monitoring of Members' implementation of their WTO obligations. It may also partly explain why alternative sources of information on domestic support, such as that from the OECD's PSE, has obtained greater currency even though it was not designed with a trade objective in mind.

To avoid problems concerning the comparability of the data series over time, a panel (i.e., a sample) of WTO Members who have reported their Current Total AMS uninterruptedly since 1995 until 2001 has been constructed. The cut-off year of 2001 was chosen because that was the latest year in which there are data on the three Members (EU, US, and Japan) with the highest levels of Current Total AMS. The panel consists of 21 Members (out of the 36 who have Total AMS commitments). Those included in the panel are Australia, Brazil, Colombia, Cyprus, Czech Republic, the EU, Hungary, Iceland, Israel, Japan, Morocco, New Zealand, Norway, Poland, Slovak Republic, Slovenia, South Africa, Switzerland-Liechtenstein, Thailand, Tunisia and the United States.

Chart 2 shows the Bound and Current Total AMS from 1995 to 2001 of the panel of 21 WTO Members. The Current Total AMS refers to the actual level of total AMS in a given year while the Bound Total AMS is the legally binding ceiling of total AMS for that year. These amounts have all been converted into US dollars in order to be able to aggregate and compare the figures. Bound Total AMS has fallen by an average of 7.2 per cent over the 1995-2001 period, from US$191.4 billion to US$122.1 billion. But Current Total AMS has been reduced at a far sharper rate of 10.3 per cent per annum. For the 21 WTO Members, actual levels of trade-distorting support (expressed as Current Total AMS) have been reduced by nearly half, from US$115.1 billion in 1995 to US$60.1 billion in 2001. Thus, Current Total AMS has fallen from an average of 60 per cent to less than half of the Bound Total AMS in 2001. Furthermore, since the figures on Bound Total and Current Total AMS are in nominal terms, they understate the real reduction in trade distorting support that has occurred over the 1995-2001 period, given that the US inflation rate (as measured by the US GDP deflator) averaged around 2 per cent annually over the period.

[199] In other words, these WTO Members have inscribed commitments in Section I of Part IV of their Schedules.

Chart 2
Bound and current total AMS, 1995-2001
(Billion dollars)

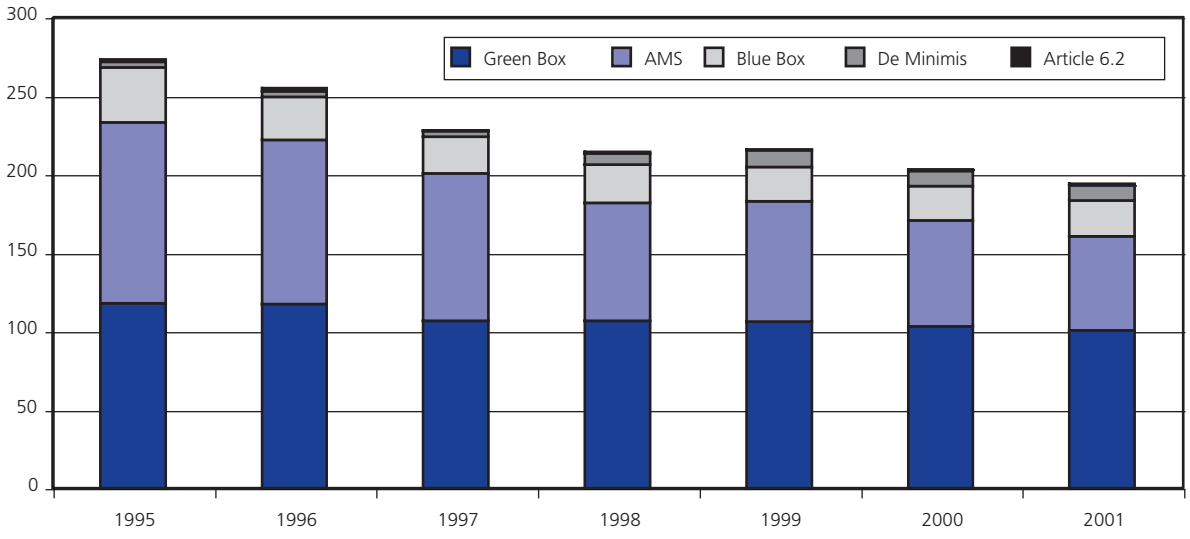


Source: WTO Secretariat.

Although there is only a commitment to reduce total bound AMS, other components of domestic support have also decreased, although by a slower rate. Thirty-nine WTO Members have been able to notify their domestic support measures over the entire 1995-2001 period.[200] Using this larger sample of Members, one finds an annual average reduction of 6.9 per cent on blue box spending, 5.7 per cent on Article 6.2 measures, and 2.6 per cent on green box measures. The only component of domestic support which has increased over the six year period is *de minimis,* which nearly tripled in amount from US$3.8 billion in 1995 to US$9.6 billion in 2001.

Thus, if one looks at all of domestic support, including not only Current Total AMS, but *de minimis* levels, blue box, green box and Article 6.2 measures, one observes a downward trend. Chart 3 shows total domestic support (Current Total AMS, *de minimis*, blue box, green box and Development Programmes) from 1995 to 2001 of the 39 WTO Members. Total domestic support has fallen from US$272.9 billion in 1995 to US$193.8 billion in 2001, representing an average annual reduction of 5.5 per cent. Again, since the figures on domestic support are all in nominal terms, they understate the real reduction that has occurred over the 1995-2001 period.

Chart 3
Domestic support and its components, 1995-2001
(Billion dollars)



Source: WTO Secretariat.

So as of 2001, 52 per cent of domestic support represented spending on green box measures; 31 per cent is AMS; 12 per cent is on blue box measures; 5 per cent is on *de minimis*; and less than half a per cent is on Development Programmes spending.

(ii) Leading providers of domestic support

Table 14 shows the top ten providers of domestic support. Instead of taking just one year, say 2001, to determine the list of Members with the largest subsidy programmes, the figures were averaged over the 1995-2001 period. Since the subsidy figures have been converted into US dollars, the ranking established with just one year of data may be sensitive to how strong the US dollar was during that year. Taking the

[200] In addition to the 21 already identified, the Members included in this larger sample include Barbados, Bolivia, Chile, Cuba, Dominican Republic, El Salvador, Guyana, Honduras, Hong Kong, China; Macao, China; Nicaragua, Paraguay, Philippines, Romania, Singapore, Trinidad and Tobago, Turkey and Uruguay.

average over a longer period should help smooth changes in exchange rates. In addition, a number of other Members with large support programmes were included in the calculation even though they provided notifications only until the year 2000.

Table 14 shows that the bulk of the support is provided by three Members; the EU, the United States and Japan. During the 1995-2001 period, the EU spent an average of US$96.1 billion on domestic support, followed by the United States with US$66.2 billion and then Japan with US$41.8 billion. After the top three Members, the amount provided by the others drop off very quickly. The fourth largest provider of support, Republic of Korea, averaged US $7.5 billion during the period. While seven of the top ten providers of support are OECD members, three are not – Brazil, Thailand and Cuba.

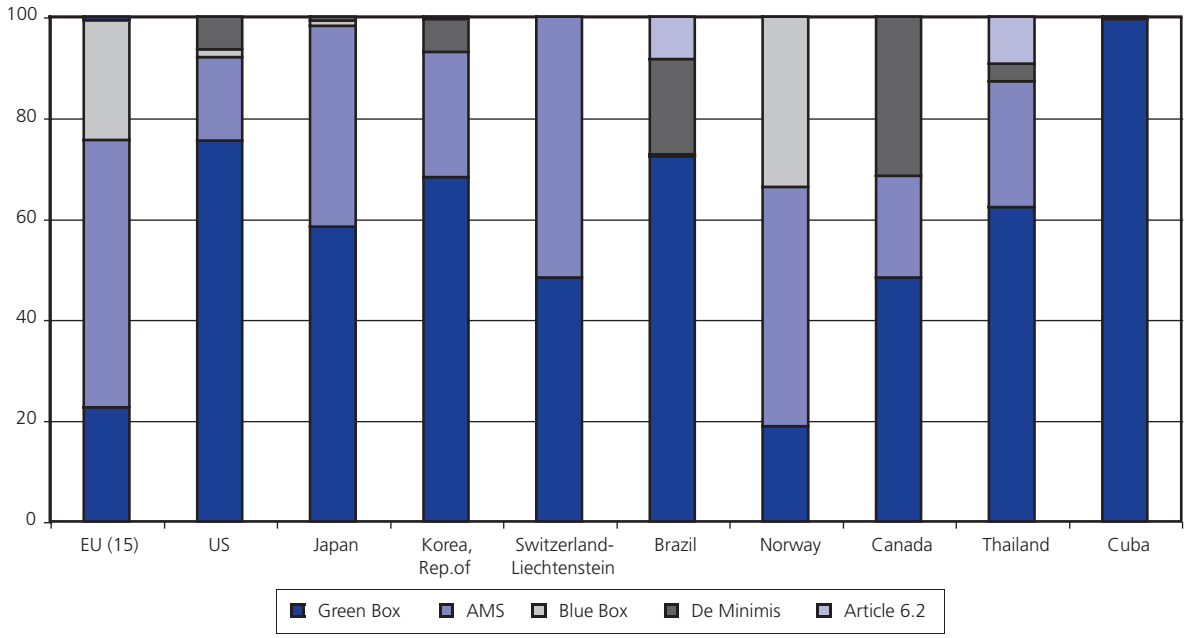
Table 14
Leading providers of domestic support, 1995-2001
(Billion dollars)

Rank	Member	Total domestic support
1	European Union (15)	96.1
2	United States	66.2
3	Japan	41.8
4	Korea, Rep. of [a]	7.5
5	Switzerland - Liechtenstein	4.6
6	Brazil	3.5
7	Norway	3.0
8	Canada [a]	2.6
9	Thailand	1.9
10	Cuba	1.3

[a] Period 1995-2000.
Source: WTO Secretariat.

Chart 4 shows the composition of the expenditures on domestic support of the top providers. The AMS and green box measures predominate. The Members where the AMS constituted nearly half of domestic support were the EU (15), Switzerland-Liechtenstein and Norway. For all the developing countries in the list, the bulk of their spending was notified under green box measures. *De minimis* is important for Brazil, Canada, Republic of Korea and the United States. The blue box is important only for the EU(15) and Norway.

Chart 4
Composition of domestic support of leading providers, 1995-2001 or available years
(Percentages)



Source: WTO Secretariat.

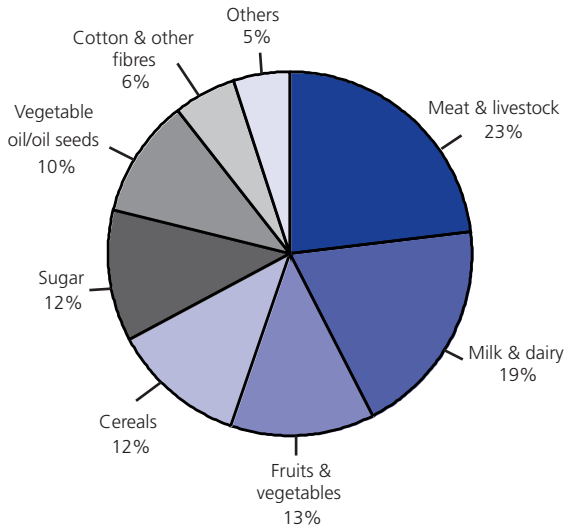
Table 15 provides a sense of the scale of total domestic support as well as Current Total AMS, by showing them as a share of the total value of agricultural production. This can only be done for a selected number of WTO Members, but the list includes the Quad countries as well as a number of large developing countries, like Brazil and South Africa. As shown by Table 15, there is a large variation in the amount of agricultural subsidies, even for this limited sample of Members, and this variation is most evident for total domestic support. Even when scaled against the total value of agricultural production, domestic support looms large in the EU, the US, and Japan, with domestic support spending representing over a third of the value of agricultural production in 2001.

Table 15
Total domestic support and AMS as share of total value of agricultural production of selected WTO Members
(Percentages)

	Share of total value of agricultural production	
Member	Total domestic support	AMS
Australia	3.9	0.7
Bangladesh	1.2	...
Brazil	7.2	0.0
Bulgaria	1.6	0.7
Canada	14.5	2.7
Chile	5.2	...
Estonia	6.5	...
EU (15)	34.3	15.9
Hungary	14.6	10.7
India	10.6	...
Israel	20.9	7.8
Japan	37.6	7.5
Jordan	14.3	0.0
Korea, Rep. of	22.2	5.1
Peru	11.3	...
Romania	3.3	...
South Africa	6.5	0.9
Tunisia	4.7	0.0
United States	36.3	7.3
Uruguay	3.6	...

Source: WTO Secretariat.

Chart 5
Composition of product-specific AMS, 2001
(Percentages)



Source: WTO Secretariat.

However, Australia which is also an OECD member provides less than 4 per cent of total support to its agricultural sector. Among developing countries, the Republic of Korea and Israel provide domestic support that amounts to over a fifth of the total value of agricultural production.

Turning to the case of Current Total AMS, the variation tends to be more muted. It exceeds a tenth of the value of agricultural production only in the case of the EU (15) and Hungary. The Current Total AMS is between 7 per cent to 8 per cent of the value of agricultural production for both Japan and the United States.

(iii) Product-specific AMS

WTO Members' notifications also provide information about the incidence of subsidies at the product level. In 2001, the total amount of product-specific subsidies notified was US$59.7 billion. The commodities which obtained the most support were meat and livestock (23 per cent of product-specific AMS), milk and dairy products (19 per cent), fruits and vegetables (13 per cent), cereals (12 per cent), sugar (12 per cent) and vegetables oils and oilseeds (10 per cent).

(e) Incidence of export subsidies

(i) Introduction

Export competition measures can include all, or elements of, direct export subsidies (such as export refunds), officially supported export credits, food aid (notably the component used to facilitate the disposal of a country's surplus production) and exporting State Trading Enterprises (STEs). The defining characteristic of all of these instruments is their potential to set different prices that are lower for foreign buyers than for domestic producers or domestic consumers, if not for both groups.[201] With a total of close to US$3 billion in the year 2000 (last year for which complete information is available), total export subsidy spending is small compared to approximately US$200 billion of domestic support notified for the same year. However, owing to their highly trade-distortive nature,[202] the phasing-out of export subsidies agreed at the Hong Kong

201 For an overview of export competition measures see OECD (2004b).

202 Export subsidies are considered to be more harmful than production subsidies because they distort two price margins (consumption and production).

Ministerial Conference is important in order to prevent more widespread use in the future and bring agriculture in line with non-farm trade.[203]

The AoA requires all Members with annual commitment levels to notify for each product the budgetary outlays for export subsidies and subsidized export quantities, as well as food aid volumes (Table ES:1 in the AoA). Supporting Table ES:1 is meant to provide a breakdown of these figures into the categories direct export subsidies, sales of stock, subsidies financed by producers by virtue of government action,[204] cost reduction measures and internal transport subsidies. Furthermore, notifications must be submitted by developing Members using exempt export subsidies under Article 9.1(d) and (e) (Supporting Table ES:2), by Members without export subsidy commitments that are significant exporters of individual products (Table ES:2), as well as by all food aid donors (Table ES:2 and Supporting Table ES:2 and Table ES:3). Other forms of export subsidization need not be notified. However, export credits and export credit guarantees as well as STEs are part of the export competition pillar in the Doha negotiations. Each of these four instruments will be discussed in more detail in the following subsections.

(ii) Product-specific export subsidies

Various WTO Secretariat documents put together on the basis of notifications under the AoA provide a comprehensive though hardly up-to-date overview of major subsidizing countries and subsidized sectors. WTO (2005d) lists the 25 Members with export subsidy reduction commitments. Of these, 14 Members provide export subsidies:[205] the European Union (plus the recently acceded countries Cyprus, the Czech Republic, Hungary, Poland and the Slovak Republic), Israel, Mexico, Norway, Panama, Switzerland, Turkey, the United States and the Bolivarian Republic of Venezuela. In addition, seven countries with commitments had subsidized exports but ceased to do so at some point in the past (Australia, Canada, Colombia, Iceland, New Zealand, Romania and South Africa), while four Members have scheduled commitment levels but have not used them (Brazil, Bulgaria, Indonesia and Uruguay). Six countries (India, Republic of Korea, Morocco, Pakistan, Thailand and Tunisia) have used export subsidies exempt from reduction commitments.[206]

WTO (2005d) gives an overall summary, for each Member concerned by product or product group, of the final bound export subsidy commitment levels by implementation year in relation to budgetary outlay and volumes. Table 16 indicates that despite significant reductions the EU has remained the dominant subsidizer throughout the 1995-2000 period as far as absolute outlays are concerned. Switzerland comes a distant second, and the United States and Norway alternate as the third and fourth largest subsidizers during that time period. However, as shown in Chart 6, export subsidies by Switzerland and Norway constitute a much larger share of their agricultural output than in the two other major subsidizers. The share of export subsidies in total agricultural production appears to be particularly low for the United States. Over the six-year period under consideration, despite large variations, these shares appear to edge downwards, with the exception of Norway.

203 Paragraph 6 of the Hong Kong Ministerial Declaration contained in document WT/MIN(05)/DEC of 22 December 2005 reads in part: "We agree to ensure the parallel elimination of all forms of export subsidies and disciplines on all export measures with equivalent effect to be completed by the end of 2013. This will be achieved in a progressive and parallel manner, to be specified in the modalities, so that a substantial part is realized by the end of the first half of the implementation period.".

204 For instance, the EC sugar regime, which is further explained below, through a complex system of quotas and other regulations, creates additional incentives for sugar farmers to export despite their financial contributions.

205 Notification information to the Committee on Agriculture have been reviewed up until 4 October 2005. For consistency purposes with the remainder of the Report, the focus here is on budgetary outlays, although commitments have also been made in volume terms.

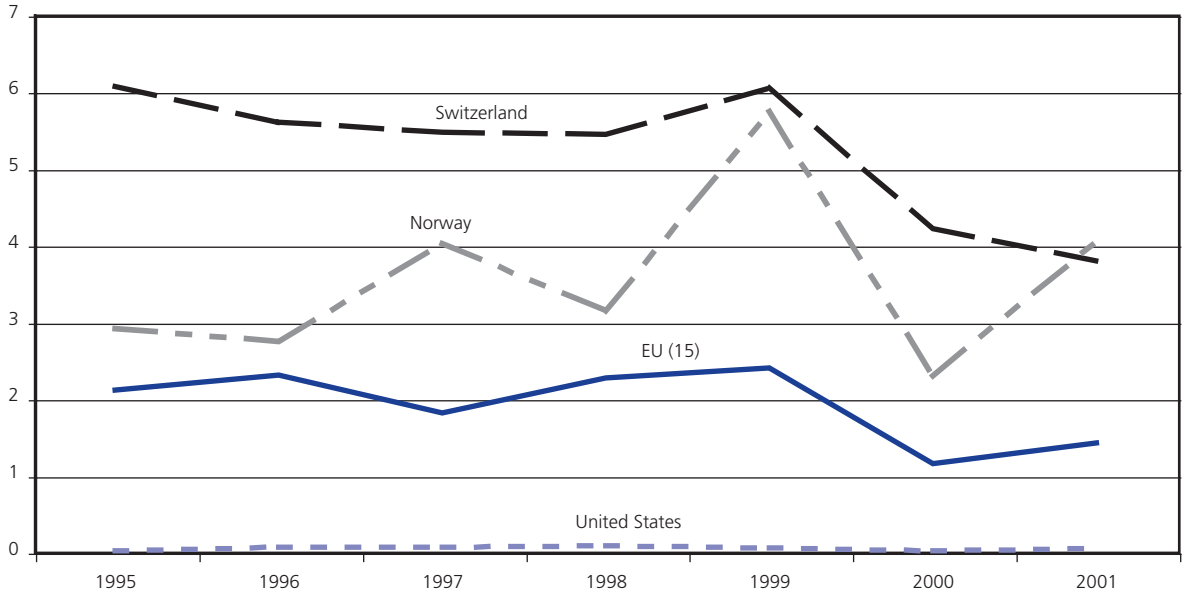
206 For an overview, see WTO (2002b). These subsidies have been notified in relation to AoA Article 9.4 which allows developing Members during the implementation period – and subject to certain conditions – to provide subsidies to reduce the costs of marketing exports and the costs of international transport and freight, as well as to arrange for internal transport and freight charges on export shipments to be provided on terms more favourable than for domestic shipments without undertaking reduction commitments as normally required under AoA Articles 9.1(d) and (e).

Table 16
Export subsidy outlays, 1995-2000
(Million dollars and percentages)

	1995		1996		1997		1998		1999		2000	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
European Union (15)	6314	88.8	6748	89.7	4797	87.7	5976	90.1	5628	89.6	2462	87.1
Switzerland	446	6.3	369	4.9	295	5.4	292	4.4	290	4.6	189	6.7
Norway	83	1.2	78	1.0	102	1.9	77	1.2	128	2.0	45	1.6
United States	26	0.4	121	1.6	112	2.1	147	2.2	80	1.3	15	0.5
Other countries	243	3.4	202	2.7	166	3.0	144	2.2	151	2.4	116	4.1
Total	7112	100.0	7519	100.0	5473	100.0	6636	100.0	6278	100.0	2826	100.0

Source: WTO Secretariat.

Chart 6
Export subsidies as share of total value of agricultural production, selected countries, 1995-2001
(Percentages)



Source: WTO Secretariat.

Chart 7 portrays total export subsidy disbursements and WTO bindings of all Members with export subsidy commitments. According to WTO notifications, overall outlays over the 1995 to 2000[207] period always remained well below commitment levels. At about 17 per cent annually on average, budgetary outlays in dollar terms declined more than commitment levels, which only shrank by approximately 14 per cent. In addition, real reductions were more significant than suggested by these nominal values, since annual inflation, as measured by the US GDP deflator, amounted to 1.6 per cent on average over the 1995 to 2000 time period. After 2000, commitment levels for the developed countries have remained unchanged, since their implementation period expired after six years. Judging from EU data as the biggest spender, budgetary outlays continued to be reduced in 2001, hence further increasing the gap between actual spending and commitment levels, but went up again in 2002.

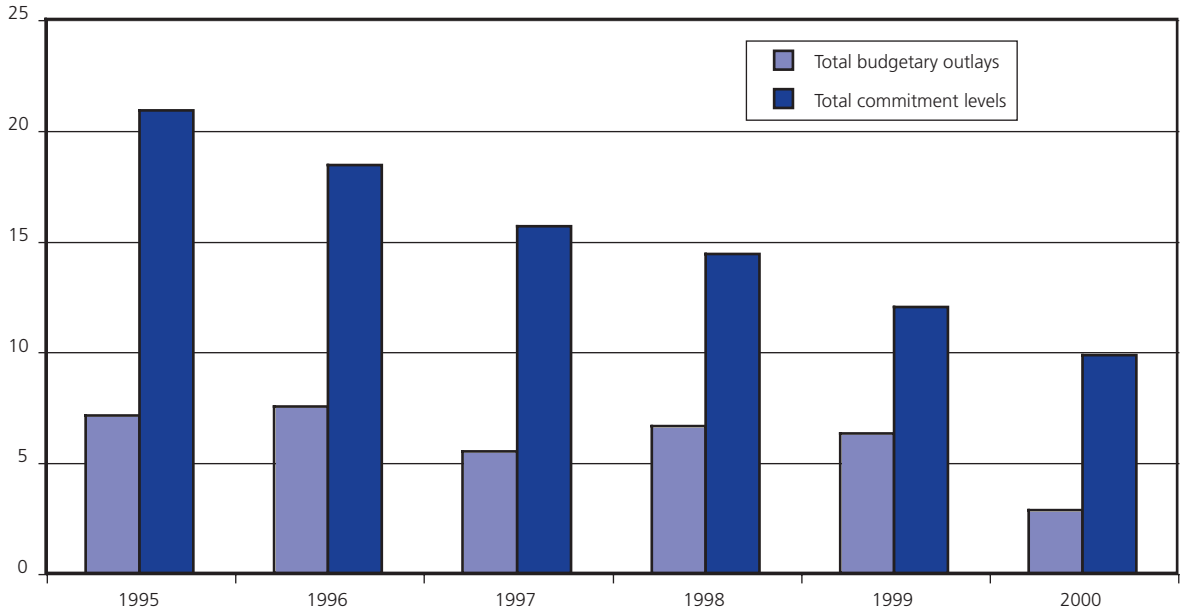
These aggregate averages conceal a considerable amount of variation between countries and products. In individual years, while commitment levels declined (also in dollar terms), spending increased.[208] For instance, in 1998 the EU spent almost US$1.2 billion more than the year before. This substantial increase in dollar terms was not due to movements in the exchange rate, which was quite stable during that time. Conversion into

[207] 2000 is the last year for which this aggregation can be made, since thereafter data on key Members is missing.

[208] Conversions into dollars are purely made for aggregation and comparability purposes. It is important to recall that each Member is bound by commitments in the currency specified in its schedule, which for most is their local currency.

a common currency also makes spending increases by the EU between 1995 and 1996 appear more modest than they actually were owing to a devaluation of about 6 per cent of the ECU against the dollar. Between 1998 and 1999, despite additional outlays of ECU 280 million, spending in dollar terms even appeared to be lower than in the previous year after an 11 per cent devaluation of the ECU. Hence, in local currency, outlays by the EU were reduced by only about 11 per cent on average, which is still more than the overall decline in commitment levels of around 9 per cent per year. As a general rule, export subsidies were high when world market prices for key agricultural products were low. For instance, beef prices were at historically low levels in 1996, and cereals and butter prices strongly fell between 1997 and 1999.

Chart 7
Total export subsidy commitment levels and budgetary outlays, 1995-2000
(Billion dollars)



Source: WTO Secretariat.

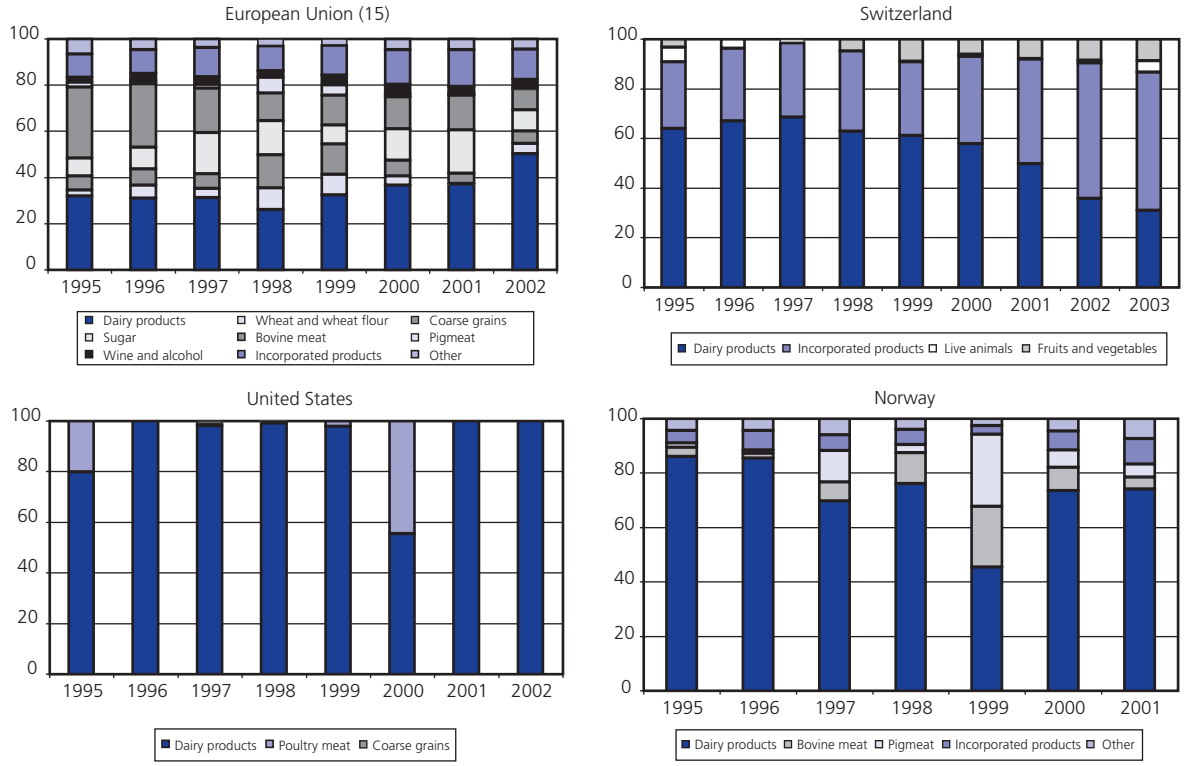
Chart 8 shows the incidence of export subsidies by product for the four principal subsidizers.[209] For the EU, sugar, other milk products, beef and butter and butter oils accounted for more than 60 per cent of budgetary outlays in 2001. With the exception of sugar, commitment levels are not normally exhausted. There has been a notable reduction in export subsidies for beef over time. Switzerland, in the year 2000, spent almost half of its export subsidies on milk products. Overall, commitment levels are used to a large extent. Despite having committed a range of products, the United States has allocated its notified export subsidies mainly to three products in the dairy sector between 1995 and 2002. Butter and butter oil received almost half of budgetary outlays with skimmed milk powder accounting for most of the remaining funds. In Norway, over the time period under consideration, the largest outlays have gone to dairy products (mostly cheese), although their relative importance varied between 86 per cent in 1995 and 45 per cent in 1999, when expenditures for bovine and pig meat tripled compared to the year before.

209 Some of the product groupings listed in WTO document TN/AG/S/8/Rev.1 relating to product-specific commitments have been aggregated or renamed for analytical purposes and easier graphical display. The following modifications have been made: for the EU and United States, butter and butter oil, skim milk powder, cheese and other milk products form the category "dairy products". For the EU, wine and alcohol are combined into one category. Rice, olive oil, poultry meat, eggs, fruit and vegetables (both fresh and processed) as well as raw tobacco are categorized under "other". For Norway, butter, cheese and whey powder are combined into the category "dairy products". Lamb meat, poultry meat and eggs and egg products form the category "other". "Processed agricultural products" have been relabelled as "incorporated products". For Switzerland, *"produits laitiers"* have been translated into "dairy products", *"produits transformés"* into "incorporated products" and "*bétail d'élevage*" and *"chevaux"* have been combined and translated into "live animals". *"Fruits"* and "*pommes de terre*" are combined into the category "fruits and vegetables". In addition, for Switzerland, the values for the year 1996 in the categories "*fruits*" and "*pommes de terre*" are missing. In order to calculate totals, presumed values had to be calculated as the average of the years 1995 and 1997 in each category. Detailed data according to the product groups defined in WTO document TN/AG/S/8/Rev.1 for the last available year are given in Annex Table 2.

At the product level, export subsidy outlays occasionally went beyond commitment levels. For instance, in 1999, Norway exceeded its product-specific commitment levels for bovine and pig meat, and, to some extent, also for butter and cheese. Also in 1999, the EU overspent in relation to its commitments on skim milk powder, other milk products, incorporated products, pig meat and alcohol. In the same year, this was the case for the United States in regard to cheese. As mentioned above, these surges in export subsidization of certain commodities reflect world market price fluctuations reaching very low levels in 1999 for cereals, dairy and, to a certain extent, meat products.

Almost every year between 1996 and 1999 has seen over-subsidization of exports by some Member on some product. Despite being legally covered under AoA Article 9.2(b), which, during that time period and within certain limits, allowed for export subsidization in excess of commitment levels if these were not fully exhausted in previous years, these practices were heavily criticized in meetings of the Committee on Agriculture as being incompatible with the spirit of the Agreement. The possibility of such "rollover relief" has expired since and one of the conditions, namely that the total cumulative amounts of budgetary outlays over the entire implementation period do not exceed the amounts that would have resulted from full compliance, appeared to have been fulfilled, judging from the absence of further complaints.

Chart 8
Shares of export subsidy outlays by product, selected countries, various years
(Per cent)



Source: WTO Secretariat.

The breakdown by instrument of product-specific budgetary outlays in the respective Supporting Tables ES:1 show that for the four major subsidizers, export subsidies mainly come in the form of direct subsidies, such as export refunds, i.e. compensation upon export for the wedge between the international market and the higher domestic price. Notified export subsidies by the United States exclusively relate to direct payments. For the most part, this is also the case for the EU, which in addition, in several years, has notified sales of stock of coarse grains and alcohol. Switzerland, in addition to direct payments, undertakes sales of stock of fruit, which also benefit from cost reduction subsidies.[210]

[210] Cost reduction subsidies provided by Switzerland under the "Price Compensation Scheme" are export refunds to compensate for higher costs of locally produced raw materials (due to agricultural policy measures) used as inputs in the production of processed agricultural goods for exports. For mainly imported raw materials, the refunds correspond to the border charges paid. For more see the Trade Policy Review Report of Switzerland and Liechtenstein by the WTO Secretariat contained in document WT/TPR/S/141.

A quite complex system of export subsidization is in place in the EU's sugar sector. Exports of sugar by the EU are exclusively supported by producer financed subsidies in an extensively regulated market that increases the incentives to export. The EU sugar regime sets production quotas (so-called A and B quotas), regulates prices of sugar beet and establishes a framework for the contractual relationships between beet growers and sugar producers. Production levies are applied to all quota sugar to cover the costs of export refunds for the surplus of A and B sugar beyond domestic consumption. At the same time, producers realize highly remunerative sales in the domestic market through a system of import controls and minimum prices. Hence, despite being self-financing and budget-neutral, the system provides an incentive for farmers to produce sugar beets at a marginal cost that exceeds the world price, even though they must fund export subsidies. This type of governmentally-managed system has therefore also been included in the list of export subsidies under AoA Article 9.1(c).[211] Similar systems of producer financed subsidies and governmental intervention are the major form of export subsidization in Norway, in particular for cheese, butter and eggs and egg products for which no additional direct export subsidies are provided.

(iii) Export credits

Export credits are insurance, guarantee or financing arrangements that enable a foreign buyer of exported goods and/or services to defer payment over a period of time. They may come in the form of official financing support, i.e. direct credit (re-)financing or interest rate support, or in the form of export credit guarantees or insurances, i.e. pure cover, or as any combination of both (OECD, 2004c). At Hong Kong, Members agreed, inter alia, that export credit, export credit guarantee or insurance programmes should be self-financing, reflecting market consistency, and of a sufficiently short duration.

Information on the incidence of export credits is difficult to obtain given that (i) countries are not currently obliged to notify their use of such expenditure to the WTO; and, (ii) the terms under which export credits are provided are deemed to be of a confidential nature. Most analyses on officially-supported export credits in agriculture are based on information presented by the OECD and derived from a confidential survey of Participants to the Arrangement on Officially Supported Export Credits[212] covering the time period from 1995 to 1998. From this study (OECD, 2000a) it appears that the export subsidy equivalent of export credits is most pronounced for the United States, Australia, Canada and a number of European Union member countries.[213] According to publicly available OECD statistics on export credit activities presented in Table 17, long-term (over five years) export credits to agricultural products barely represent half of one per cent of the total or less than one-hundredth of the amount going to manufacturing in OECD countries in 2002. A comparison of the aggregate results presented in OECD (2000a) shows that these numbers do not capture the full extent to which export credits are provided in agriculture. The main reason appears to be that, in agriculture, most credits are short-term (i.e. less than one year) or medium-term (between one and five years), for which the OECD does not collect publicly available data, at least not at the sectoral level in the latter case.[214]

211 In addition, the WTO Appellate Body found that so-called C sugar (production beyond the A and B quotas), despite being ineligible for domestic price support or direct export subsidies, also constituted an export subsidy in the sense of AoA Article 9.1(c) through cross-subsidization. See Appellate Body Report, *European Communities-Export Subsidies on Sugar*, WT/DS265,266,283/AB/R, adopted on 19 May 2005. The operation of the EU sugar regime has since been under review. On 20 February 2006 EU agriculture ministers adopted a wide-ranging reform of the Common Market Organisation for sugar, based on a proposal tabled by the European Commission in June 2005. The reform of the sugar sector is to come into force on 1 July 2006. For a press release on the agreement by ministers see http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/194&format=HTML&aged=0&language=EN&guiLanguage=en. The original proposal by the European Commission is available at http://europa.eu.int/comm/agriculture/capreform/sugar/prop_en.pdf, both sites visited on 28 February 2006.

212 It should be noted that although the focus of the survey of Participants to the Arrangement on Officially Supported Export Credits (resulting in the OECD, 2000a, study) was on the use of export credits in agriculture, agricultural commodities are not covered by the Arrangement as per its paragraph 5(c) (OECD, 2004c: 8). Pursuant to AoA Article 10.2, which obliges Members to work towards the development of internationally agreed disciplines to govern the provision of export credits, export credit guarantees or insurance programmes, the Arrangement's Participants, from 1996 to 2000, negotiated disciplines on export credits for agricultural products in the OECD. A Draft Understanding (which can be downloaded at http://www.oecd.org/dataoecd/31/12/1939746.pdf) represents the state of play reached in November 2000, at which time a consensus could not be achieved. Sector Understandings already exist for ships, nuclear power plants and civil aircraft.

213 For an economic analysis of export credits see also Vercammen (1998).

214 In contrast, OECD (2000a) is based on a rather complete, albeit confidential dataset.

Table 17
Long-term agricultural export credits by OECD member countries, 1998-2002
(Million dollars and percentages)

	1998	1999	2000	2001	2002
Million dollars	76.1	31.5	22.1	97.0	46.2
Share of total export credits	0.4	0.1	0.1	0.6	0.3

Source: OECD (2002b).

In individual countries, export credit information on agriculture is made publicly available. In the United States, for instance, when private financial institutions extend loans to countries that want to purchase US agricultural exports, the governmental Commodity Credit Corporation (CCC) issues a guarantee and assumes the default risk on the loans. Annual funding for such export credit guarantee programmes by the United States has been of the order of US$3 billion, supporting between 5 and 6 per cent of total agricultural exports (see Table 18).[215] If food aid under P.L. 480,[216] Title I is included, under which long-term credit agreements are available to facilitate government-to-government purchases of agricultural commodities by developing countries with the potential to become commercial markets, this type of support increased to 7 per cent of agricultural exports in several years and to about 2 per cent of total agricultural production. Most of the agricultural export credit guarantees are indeed short-term. Under the GSM-102 programme, the CCC guarantees repayment of 98 per cent of the principal and part of the interest in case of default or non-payment, when US banks extend credit to foreign banks to finance sales of US agricultural goods for up to three years. The intermediate-term programme (three to ten years) seems to be used less, with supplier credit guarantees gaining in importance instead. Under the latter programme,

Table 18
United States' agricultural export credit guarantees, 1995-2002
(Million dollars and percentages)

	1995	1996	1997	1998	1999	2000	2001	2002
Total agricultural production	191088	204808	205080	190082	183777	189318	197892	193151
Total agricultural exports	54729	59867	57338	53711	49148	50798	52699	53294
Total CCC Programs	2921	3230	2876	4037	3045	3082	3227	3388
Short term (GSM-102)	2772	3079	2809	3963	2955	2928	2959	2936
Intermediate term (GSM-103)	149	151	63	56	44	33	42	0
Supplier credit guarantees	0	0	4	18	46	116	226	452
Facilities financing guarantees	0	0	0	0	0	5	0	0
P.L. 480, Title I	172	219	153	164	687	157	105	102
Memorandum items:								
Agricultural exports covered by export credit programmes as share of total agricultural production (%)	1.6	1.7	1.5	2.2	2.0	1.7	1.7	1.8
Agricultural exports covered by export credit programmes (%)	5.7	5.8	5.3	7.8	7.6	6.4	6.3	6.5

Source: CRS (2004).

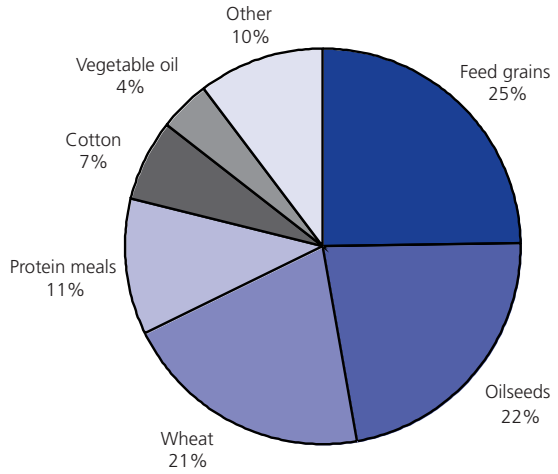
215 These values do not represent actual outlays, for instance due to defaults, nor the total amount of loans that have been guaranteed. They simply refer to the funding made available to commercial parties by the government. Calculating the subsidy equivalent of export credits and export credit guarantees is a complex undertaking. It depends, among other things, on repayment periods and minimum interest rates. Under the OECD's Export Credit Arrangement, the latter role is fulfilled by Commercial Interest Reference Rates (CIRR), which exist for most OECD countries and are adjusted on a monthly basis. They are intended to reflect market rates of interest in the domestic market of the currency concerned, closely corresponding to the rate for first-class domestic borrowers, i.e. they are mostly based on treasury bond yields, plus a margin. The prevailing CIRRs are available on the OECD website: (http://www.oecd.org/topic/0,2686,en_2649_34169_1_1_1_1_37431,00.html). While CIRR may help to control subsidy elements in the form of interest rate support, it is also important that governmental export credit facilities charge premium rates adequate to cover long-term operating costs and losses if circumvention is to be prevented. Hence, in the so-called "Knaepen" package that came into force in 1999, it was agreed that pricing should be risk-based, converge and reflect the differing quality of officially-supported export credit products. For that purpose, guidelines on minimum premium benchmarks assigned to seven country risk categories have been established. For more see OECD (1998).

216 Public Law 480 (P.L. 480) is also known as the so-called "Food for Peace Program".

the CCC guarantees to repay 65 per cent of the export value to US exporters that have extended credits directly to the importer for 180 days or less. A programme which indirectly supports agricultural exports by guaranteeing repayment to investors who export manufactured goods and services to emerging country markets to improve or establish agriculture-related storage, processing or handling facilities has hardly been used (Canada, 2004).

Chart 9 shows that for US export credit guarantees the commodity composition is quite different from the incidence of export subsidies notified to the WTO (see above). While practically all of the notified direct subsidies go to the dairy sector, export credit guarantees mainly relate to cereals. Cotton, on which there is a special focus under the Doha Development Agenda, also enjoys about 7 per cent of this type of support.

Chart 9
Commodity shares in total agricultural export credit guarantees, United States, 2002
(Percentages)



Source: CRS (2004).

(iv) State-trading enterprises

State-trading enterprises (STEs) enjoy a range of privileges made available by the government which are generally unavailable to other traders, such as the underwriting of losses. In addition, they may be given the exclusive right to import and/or export a commodity.[217] Their objectives in the agricultural sector vary across countries and include income support for domestic producers, price stabilization, expansion of domestic output, continuity of domestic food supply or increase in government revenue, with their functions and privileges varying accordingly (OECD, 2001c). STEs in developed countries usually act in a way to support farmers' incomes, whereas in developing countries, there have been cases where the activities of STEs are targeted at reducing food prices for consumers, thus squeezing margins received by farmers.[218]

At the Hong Kong Ministerial Conference, WTO Members decided to develop disciplines on STEs on export subsidies, government financing and underwriting of losses that would eliminate trade-distorting practices. They also affirmed their commitment to prevent circumvention of these disciplines. A major concern in that regard relates to the exercise of market power. Exporting STEs may be granted single desk status, i.e. the exclusive right to purchase and sell in the domestic market as well as export markets. It has been shown that STEs can exploit imperfect competition in these markets and realize the potential for price discrimination (OECD, 2001c). As a prerequisite, markets must be segmented through import barriers, such as tariffs or tariff rate quotas, in order to prevent lower-priced exports from being re-imported into the higher-priced domestic market. If it is sole buyer[219] in the domestic market, an STE may collect supplies from producers but delays payments until after both domestic and export sales have been effected. It determines the quantities offered for export and domestic sales respectively, so as to maximize producer surplus. With demand being less elastic in the domestic than in the export market (for instance due to better substitution possibilities at the international level), domestic prices exceed export prices and domestic consumption is lower than if both markets were integrated. At the same time, with farmers receiving a blended (or so-called "pooled") price

217 For the precise WTO definition, see Understanding on the Interpretation of Article XVII of the General Agreement on Tariffs and Trade 1994: para. 1.

218 McCorriston and MacLaren (2006) propose a model to assess the potential trade impact of exporting STEs that arise in both developed (where there typically is bias towards producers) and developing countries (with a typical bias towards consumers or taxpayers). While the authors confirm that that STEs in certain developed countries have trade effects which are equivalent to an export subsidy, the trade distortion in the latter countries may rather be equivalent to an export tax.

219 While being the only buyer, STEs should not be assumed to act as monopsonists, since they usually do not maximize profits.

(less marketing costs), production expands and is absorbed into increased exports. Schluep and De Gorter (2000) and others have calculated the per unit export subsidy equivalents of such practices.[220]

Domestic producers may benefit in several ways from STEs acting in such a manner. On the export side, STEs can wield market power and fully exploit the potential for price discrimination. In particular, given the oligopsonistic structure in many agricultural markets, i.e. the market power of processors, wholesalers and traders represented by a few dominant firms (Hranaiova et al., 2002), STEs can obtain higher export prices than can individual producers. If controlling domestic supply, STEs face less uncertainty in sourcing supplies for export than other competitors and may make long-term export arrangements with importing countries. Farmers can also benefit from economies of scale in marketing and quality control. Finally, STEs may contribute to stabilizing producer income through price pooling and the management and disposal of stocks (Ingco and Ng, 1998). However, in the absence of competition, and with profits (and losses) bundled in producer returns, it is difficult to assess whether these activities, such as exclusive marketing, are cost effective and indeed generate a net benefit to producers (Gropp et al., 2000).

At the WTO, a relatively small number of STEs seem to have received most attention in the past, such as the Australian Wheat Board (AWB) and the Canadian Wheat Board (CWB), which together account for 40 per cent of the global wheat market (OECD, 2000b; OECD, 2000c; Carter and Wilson, 1997). Table 19 confirms the expected price structure with domestic consumer prices exceeding export prices. The table also shows that, in both cases, a large part of the domestic production is exported and almost all exports are carried out through the STE. However, the question to what extent these STEs indeed subsidize exports is not easily answered. Much also depends on the market structure that would replace an STE in the counterfactual. Veeman et al. (1999) argue that agricultural trade is preconditioned to take place in an oligopolistic setting. OECD (2001c) and Scoppola (2003) develop models demonstrating that, under certain conditions, an STE exports more than a private profit-maximizing firm with the same degree of market power, and, hence, can be considered to subsidize exports.[221]

Table 19
Exports of wheat by Australia and Canada, selected years
(Million tonnes, A$ and Can$/tonne)

Country	Year	Total exports Quantity	Exports by STE Quantity	Av. rep. dom. sales price	Average export price	National production Quantity
Australia	1995-96	13.3	13.3	A$304/t	A$287/t	16.5
	1996-97	19.2	19.2	A$241/t	A$227/t	23.7
	1997-98	15.7	15.7	A$247/t	A$235/t	19.4
Canada	1994-95	20.8	17.0	Can$212/t	Can$225/t	22.9
	1995-96	16.2	16.1	Can$265/t	Can$280/t	25.0
	1996-97	19.4	21.4	Can$215/t	Can$234/t	29.8

Note: Total quantity exported by Canada may be greater or less than the quantity exported by state-trading enterprise (STE) due to the differences in the statistical reporting periods used by Statistics Canada (cleared by Customs) and the CWB (marketing year).
Source: WTO notifications G/STR/N/4/AUS, G/STR/N/5/AUS and G/STR/N/4/CAN.

Additional complications arise when STEs enjoy privileges, such as discounts on transportation and storage rates, preferential exchange rates, interest rates and the like that are not available to other traders. A specific privilege has sometimes been government underwriting of an STE's losses, potentially leading to more aggressive pricing strategies by the STE and, as a result, higher exports. In the case of the CWB, producers receive an initial payment that is equivalent to 70-80 per cent of the final price with additional payments being made at a later stage when the total supply of the commodity has been marketed. The initial pool payments are guaranteed

220 Schluep and De Gorter (2000) have also demonstrated that price pooling leads to higher exports than under mere price discrimination and under an equivalent taxpayer-financed subsidy.

221 This is mainly due to the inclusion of producer welfare in the STE's objectives. Profits are redistributed to producers by paying them a pooled price of domestic and world prices. Hence, exports do not only increase, as in the case of a private monopoly trader, because a lower quantity is sold on the domestic market, but, in addition, because the STE buys a higher quantity from producers as a consequence of maximizing producer surplus.

by the Canadian government such that, if the pooled price is below the initial price paid to producers, it will underwrite CWB's losses. However, government guarantees have rarely been utilized in practice. Yet, loans to the CWB are perceived as lower risk, since the government would cover in case of default, and are hence less costly to obtain (OECD, 2001c). McCorriston and MacLaren (2005) in examining both the AWB and CWB conclude that while STEs distort trade, the direction and extent depend on the differing nature of the exclusive rights enjoyed by these STEs and their objectives, as well as a range of other factors, such as the benchmark market situation, other agricultural support policies, the relative inefficiency of STEs compared to private firms and the right of private exporting firms to sell on the domestic market.

(v) Food aid

International food aid – i.e. the provision of food commodities by one country to another, free of charge or under highly concessional terms to assist the country in meeting its food needs (Thompson, 2001) – has the potential to undermine local production or displace imports from other countries. Donors may provide more food aid in times of surplus production, which usually varies countercyclically with need, i.e. food aid volumes surge when global production and food availability are high and prices low. The disposal of excess stocks (which may put downward pressure on world market prices) may, therefore, be considered an implicit export subsidy. Also, food aid may be used to develop commercial opportunities, in particular if it is tied to commercial exports of agricultural commodities in the future.[222]

The extent to which other producers are displaced depends on a host of factors, not least on the form that international food aid may take. Thompson (2001) identifies three general types: (i) emergency or relief food aid, which is targeted and freely distributed to victims of natural and man-made disasters; (ii) project food aid, which is targeted to vulnerable groups to improve their nutritional status and to support specific developmental activities; and (iii) programme food aid, which is provided directly to a recipient government or its agent for sales on local markets (so-called monetized aid), the proceeds of which are under the control of the recipient government but are subject to some form of agreement with the donor about their management and use. Emergency aid to fight hunger or to address critical food shortages arising from natural disasters is targeted at additional consumption and therefore unlikely to displace existing suppliers.[223] On programme versus project food aid, Alston et al. (1999), for example, find that farmers in the recipient country prefer international food aid to be given to the government for sale to consumers, since their losses are smaller than when it is distributed to consumers.[224]

At the Hong Kong Ministerial Conference, Members agreed to ensure the elimination of commercial displacement through "effective disciplines on in-kind food aid, monetization and re-exports so that there can be no loop-hole for continuing export subsidization" (WTO, 2005e: para. 6). At the same time, food donations addressing genuine nutritional concerns are not be hindered by subsidy disciplines. The Ministerial Declaration therefore reconfirms the commitment by WTO Members to maintain an adequate level of food aid and to take into account the interests of food aid recipient countries. It also specifies that to this end, a "safe box" for bona fide food aid is to be provided to ensure that there is no unintended impediment to dealing with emergency situations.

Several WTO provisions already deal with food aid. AoA Article 10 prohibits the tying of food aid to commercial exports of agricultural products to recipient countries and requires donors to observe the FAO's

222 Of course, in supplying international food aid donors may pursue objectives other than farm policy considerations, ranging from genuine emergency relief to foreign policy goals. One may think of food donations to North Korea by the Republic of Korea and China, which besides being targeted at malnourished children, also have political implications. See, for instance, http://news.bbc.co.uk/2/hi/asia-pacific/4568182.stm, visited on 19 January 2006.

223 Famines can be demand- or supply-driven. In the latter case, prices will climb due to insufficient food production. In this case, food aid imports are likely to be an appropriate response. A demand-driven famine is caused by the collapse of livelihoods and the inability to access food, even where there is adequate supply and low and stable prices. Here, a more appropriate response may be to support local purchases of the needy rather than adding food imports to the local supply which could depress local prices and have a negative impact on economic activity. For more information on famine see, for instance, http://www.wfp.org/aboutwfp/introduction/hunger_what.asp?section=1&sub_section=1 as well as http://www.usaid.gov/press/releases/2002/02fs_famine.html.

224 Alston et al. (1999) use a comparative static model assuming a "large" recipient country. Producers are unaffected by food aid in the small-country case. Consumers always prefer food aid given to them rather than to the government.

Principles of Surplus Disposal and Consultative Obligations.[225] The "Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries" adopted by Ministers at the end of the Uruguay Round[226] recognizes the need to provide adequate levels of food aid, while ensuring that food aid does not circumvent disciplines on export subsidies. A set of follow-up activities was agreed, including reviewing the level of food aid established periodically by the Food Aid Convention (FAC).[227]

From the long-standing discussions on food aid within the WTO, it appears that the development of criteria to decide where genuine food aid ends and the export subsidy component begins is not a straightforward exercise. The various forms of food aid - whether provided in-kind or cash, whether given to consumers or to the government, whether donated in fully grant form or on concessional terms, whether channelled through multilateral agencies or from government to government, etc. – are at the heart of discussions on possible food aid disciplines in the context of the Doha negotiations. Some of the more controversial aspects in designing specific disciplines are the following.[228] Should food aid only be given in full grant form and, if not, should the monetary value of non-grant aid be limited? Should there be a commitment not to reduce food aid volumes when prices are high? Should there be disciplines on both cash and in-kind food aid if not provided in response to appeals from relevant international or regional food agencies or if not channelled through such organizations? Should cash food aid be considered bona fide if not sourced from the donor country? In order to make disciplines work, much will also depend on the effective monitoring of international food aid, and several proposals on improved transparency have also been made.

Various international agencies, such as the WFP, UNICEF and UNHCR, have repeatedly warned against too stringent export subsidy disciplines on food aid citing that in 2004 three out of four tonnes[229] of food donated worldwide were purchased in donor countries and made in kind. In their view, past donor behaviour suggests that it was unlikely that equivalent levels of cash could be made available by donor governments, especially new developing country donors with limited cash resources.[230] It has also been stressed that these discussions come at a time, when, according to FAOSTAT, food aid volumes have dropped over recent years from 12.5 million tonnes in 1999 to not even 9 million tonnes in 2003 and even further in the most recent past, according to the WFP.[231] At the same time, Hoddinott et al. (2003) find that considerable amounts of food aid continue to flow to the

225 These Principles seek to assure that food and other agricultural commodities which are exported on concessional terms result in additional consumption for the recipient country and do not displace normal commercial imports. They are also meant to ensure that domestic production is not discouraged or otherwise adversely affected. In view of the exigencies of AoA Article 10 and concerns over circumvention of WTO export subsidy commitments the procedures for notification and consultation were revised in 1997 as set out in FAO Council Resolution 1/113. The Annex to this Resolution contains a register of 16 commodity transactions to which the reporting obligations for bilateral consultations and notifications to the Consultative Subcommittee on Surplus Disposal (CSSD) apply. The recipient country must make a commitment to maintain a normal level of commercial imports of the commodity concerned and the supplying country is required to provide import data to show that the consumption is indeed additional, i.e. would not have taken place in the absence of the transaction on concessional terms. These procedures are waived for transactions effected through intergovernmental organizations (in particular the World Food Programme, WFP) and emergency transactions. See FAO (2001).

226 This Decision can be found in GATT Secretariat (1994): 448-449.

227 Under the FAC, donors undertake to provide a minimum level of food aid expressed in tonnage or value terms. The Convention also specifies eligible recipients, the needs to be addressed and the forms that aid may take and the terms under which it should be given, precluding, for instance, the tying to commercial exports of goods or services. The existing FAC 1999 has expired and is due for renegotiation. This renegotiation is however on-hold, pending the outcome of the Doha Round. For the complete text see http://www.fao.org/Legal/rtf/fac99-e.htm.

228 For a comprehensive overview see WTO document TN/AG/6. Some of the proposals have been raised in other WTO fora as well. For instance, a proposal by the Africa Group to channel food aid through international organizations like the WFP and provide food aid exclusively in fully grant form has been submitted in the regular Committee on Agriculture in the context of implementation discussions as well under the S&D mandate of the Special Session of the Committee on Trade and Development. See for instance WTO documents TN/CTD/W/3/Rev.2 and G/AG/20.

229 "Tonnes" refers to metric tonnes.

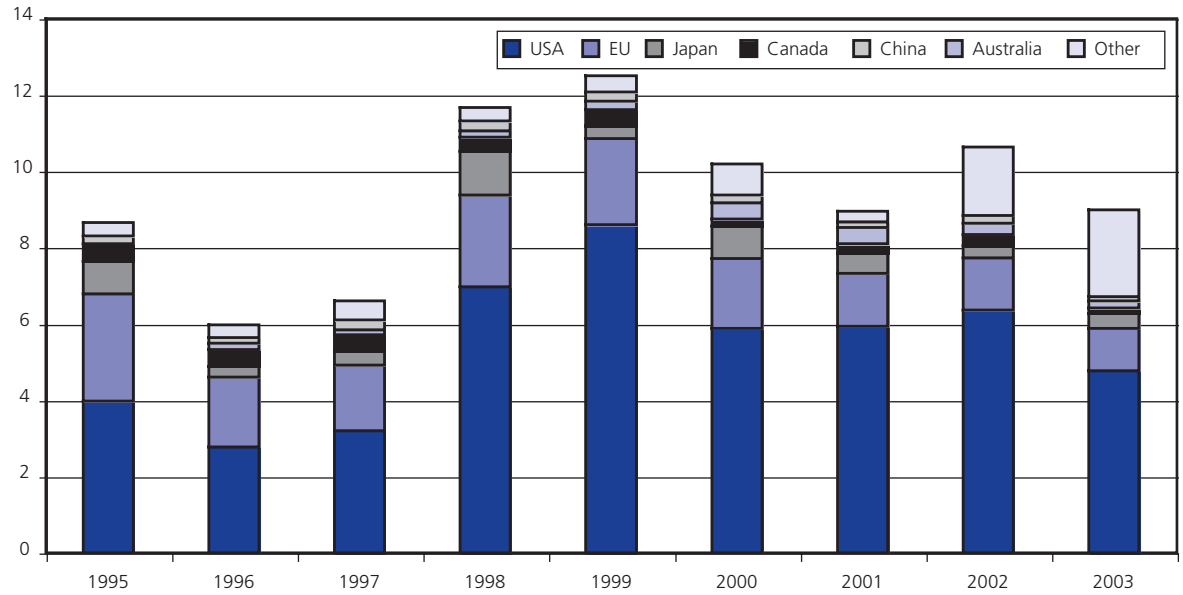
230 See, for instance, their joint press statement for the WTO Ministerial Conference in Hong Kong, China, at http://www.wfp.org/english/?ModuleID=137&Key=1956, visited on 15 December 2005.

231 See press release available at http://www.wfp.org/english/?ModuleID=137&Key=1956, visited on 15 December 2005.

relatively better-off developing countries or to the less needy.[232] They argue that besides the uncontroversial provision of food aid for emergency relief, a better targeting of available food aid resources could provide an insurance function in regions, where other mechanisms such as food markets, stock-holding and household strategies fail. In the remaining cases, i.e. where local food surpluses, well-functioning markets etc. exist, they advocate cash donations rather than in-kind contributions.

Data on food aid volumes are included in WTO export subsidy notifications. Depending on the form it takes, food aid may also be documented in specialized statistics, like the United States' regular overviews of export credit guarantees mentioned above. Perhaps the most comprehensive picture of global food aid can be obtained from the WFP and from the FAO which have created specialized databases on this issue. Chart 10 illustrates that the United States is by far the largest contributor of global food aid. It is also the most important donor for a range of individual items, especially cereals, the major commodity provided through food aid. Given its prominent role, especially between 1995 and 1999, it is also responsible for the relatively large variations in total food aid supply during that time period. It is noteworthy that the US contribution in 1999, when wheat prices stood at an all time low (price index of 63, 1995=100), was more than three times higher than its food aid shipments in 1996, when prices were almost double (price index of 117). Food aid by Japan also features substantial upward swings in 1995, 1998, 2000 and 2001. In these years, rice donations were increased by several multiples compared to the otherwise fairly constant amounts provided ranging roughly between 100,000 and 200,000 tonnes. However, there is no apparent relationship between these expansions and price developments (with prices of milled rice being consistently on decline until 2001 and only slightly increasing since) nor with variations in rice imports by Japan, which are governed by a system of tariff rate quotas to guarantee minimum market access levels.

Chart 10
Global food aid shipments by major donor, 1995-2003
(Million tonnes)



Note: The data represent aggregates of cereal and non-cereal food aid shipments. Purchases made in recipient countries are excluded. Processed and blended foods are converted into their original food components equivalent by applying the conversion factors included in the Rule of Procedures under the 1999 Food Aid Convention to facilitate comparisons between deliveries of different commodities. Food aid provided by the European Communities and its formerly 15 member states have been aggregated into one single number.
Source: FAOSTAT online at http://faostat.fao.org/, visited on 11 November 2005.

[232] Many developing countries have programmes in place to support the urban poor who often face much higher food prices than the rural population. However, Ahmed et al. (2004) find for Bangladesh that historically, the relatively well-off section of the urban population has been the principal beneficiary of food aid. Again, while the continued provision of bilateral food aid in similar cases may also be due to foreign policy considerations by donor countries seeking to support the local government, in the case of Bangladesh, several international donors persistently have demanded a better targeting of food aid, and progress has been made in this regard.

China has become a major donor over recent years, providing more food aid than Canada as of the year 2000. Webb (2003) predicts that food aid supplies will be heavily influenced by developments in United States' farm legislation and the European Union's CAP, despite the emergence of other donors, in particular China and India, and continued reliance on traditional donors such as Japan, Canada, Australia and the Republic of Korea.

Table 20 shows that the shares of bilateral channels have decreased in recent years compared to the multilateral provision of food aid. The United States are also the by far largest donor to the WFP, with the majority of its contributions going to relief operations (WFP, 2005).[233] The trend towards multilateral provision of food aid goes hand-in-hand with the relative decline in programme aid, which is provided exclusively on a bilateral government-to-government basis as grants or on concessional terms. As was said before, unlike project and relief operations, it is often not targeted at poor and food insecure people in the recipient country, but monetized, mainly through urban markets, in order to provide balance of payments or budgetary support to the recipient government (Shaw and Singer, 1996). It is also noteworthy that more food aid is procured in developing countries themselves. The US government, in 2005, has taken the initiative to shift US$300 million out of P.L. 480 Title II, which only allows for the purchasing of American agricultural commodities to be donated under the Food for Peace programme, into the International Disaster and Famine Assistance account, which is used to buy food locally or in the region.[234] The WFP purchases food from a variety of sources, notably Australia, followed by the United States, Malaysia, Thailand and Argentina. Many more developing countries are among the top 15 WFP procurement sources including India, Uganda, South Africa and Ethiopia. Purchases in certain African countries are likely also destined for local relief operations.[235] In 2004, three-quarters of food aid was still sourced in the developed world, down from almost 90 per cent in previous years. More than half of total food aid in 2004 went to Sub-Saharan Africa, up from about a third in 2001. This relative increase may be also due to the noticeable reduction of the share of South and East Asia, formerly as important a recipient of food aid as Africa.

Table 20
Delivery of global food aid, 2001-04
(Percentage of global food aid)

	2001	2002	2003	2004
Procurement in developing economies and CIS	11.6	10.6	22.4	25.9
Deliveries by channel				
Bilateral	28.3	31.3	21.4	20.6
Multilateral	41.5	40.1	48.9	52.0
NGOs	30.3	28.5	29.8	27.4
Food aid deliveries by category				
Programme	20.9	21.7	11.0	13.9
Relief	50.6	49.0	66.8	58.0
Project	28.5	29.3	22.2	28.1
Food aid deliveries by region [a]				
Sub-Saharan Africa	33.6	30.5	52.7	50.8
South and East Asia	37.2	38.4	22.4	26.4
Other Europe and CIS	11.9	10.9	6.9	6.1
Latin America and the Caribbean	9.0	12.9	4.3	8.7
North Africa and Middle East	8.2	7.3	13.7	8.0

[a] The regional breakdown in the table is the one used by the WFP and does not correspond to the regions as they are commonly defined by the WTO.
Source: WFP (2005).

233 Relief operations by the WFP consist of food aid provided in the context of the International Emergency Food Reserve (IEFR) and the Protracted Relief and Recovery Operation (PRPO).

234 Some arguments in favour of the "local purchase initiative" by Administrator Natsios of the United States Agency for International Development (USAID) include the saving on transport costs, the possibility to respond more quickly to emergencies and lower procurement prices in the region of need. See http://www.usaid.gov/press/speeches/2005/sp050503.html, visited on 20 January 2006. However, there appeared to be quite some resistance to this initiative by US farmers and shippers as well as non-governmental organizations (NGOs) involved in the distribution of US grown food aid.

235 See WFP website at http://www.wft.org/operations/Procurement/food_pro_map/foodmap.html.

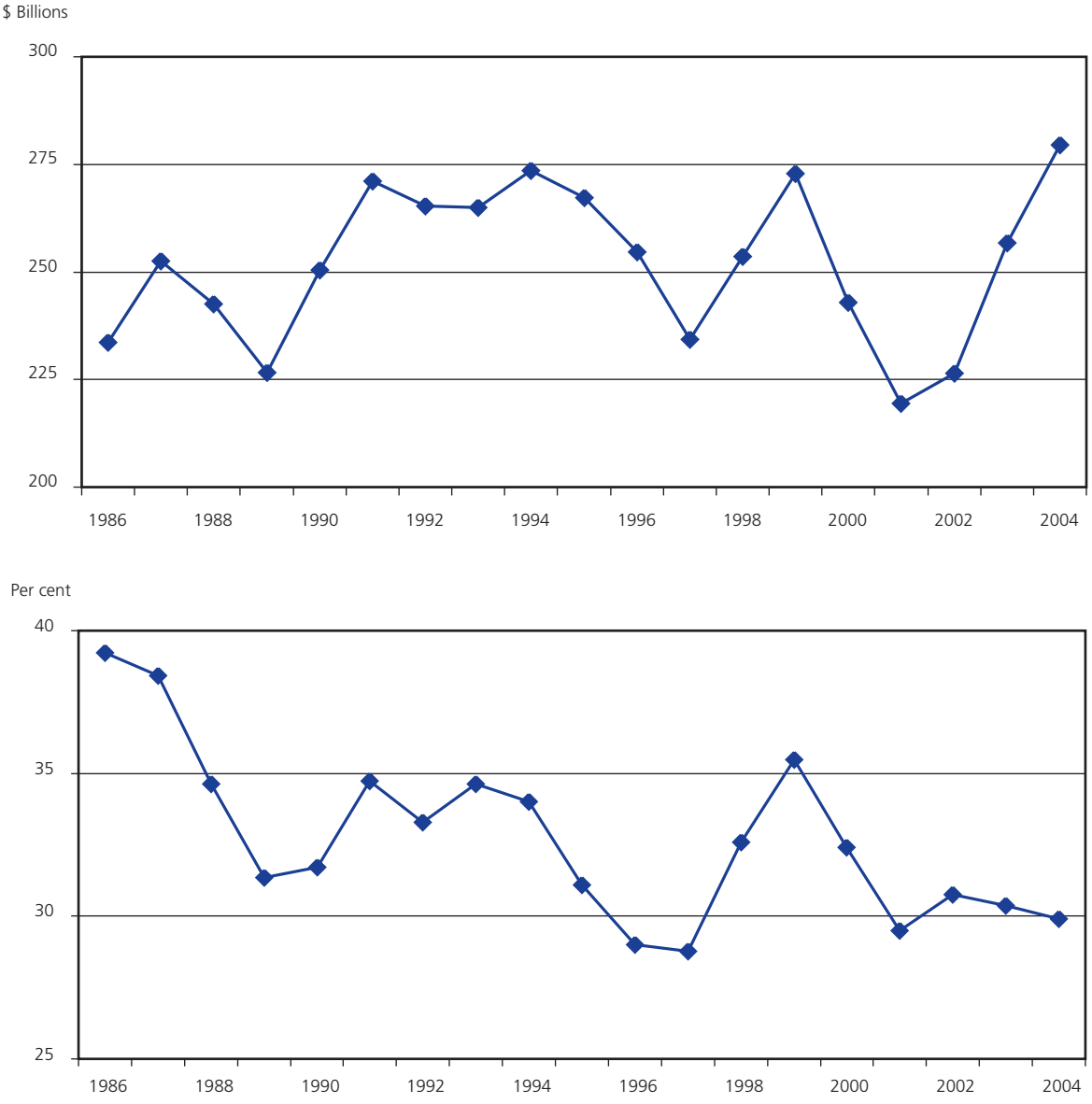
(f) Information from OECD Agricultural Database

Because OECD Members provide the bulk of agricultural subsidies, information from the database, despite crucial differences with WTO measures of domestic support, could provide further confirmation of the pattern that was observed with Current Total AMS and total domestic support. In this subsection, the information on agricultural support that comes from the OECD database, primarily the PSE, is examined. The major differences between the notion of support as conceived in the WTO and OECD policy contexts has been highlighted before and needs to be kept in mind when considering the following discussion.

(i) The PSE over time

Chart 11 gives some indication of how the PSE has evolved over time. Over the past 20 years, the nominal value of the PSE in the agricultural sector of OECD countries has not changed much, varying between US$230 and US$280 billion. But since these figures are in nominal terms, the past two decades would have seen a decline in real support to agricultural producers. If one considers the magnitude of support as a share of agricultural production, this has declined from 39 per cent in 1986 to 30 per cent in 2004, although the decline has not been smooth.

Chart 11
Producer support estimate, 1986-2004
(Billion dollars and percentage of value of agricultural production)



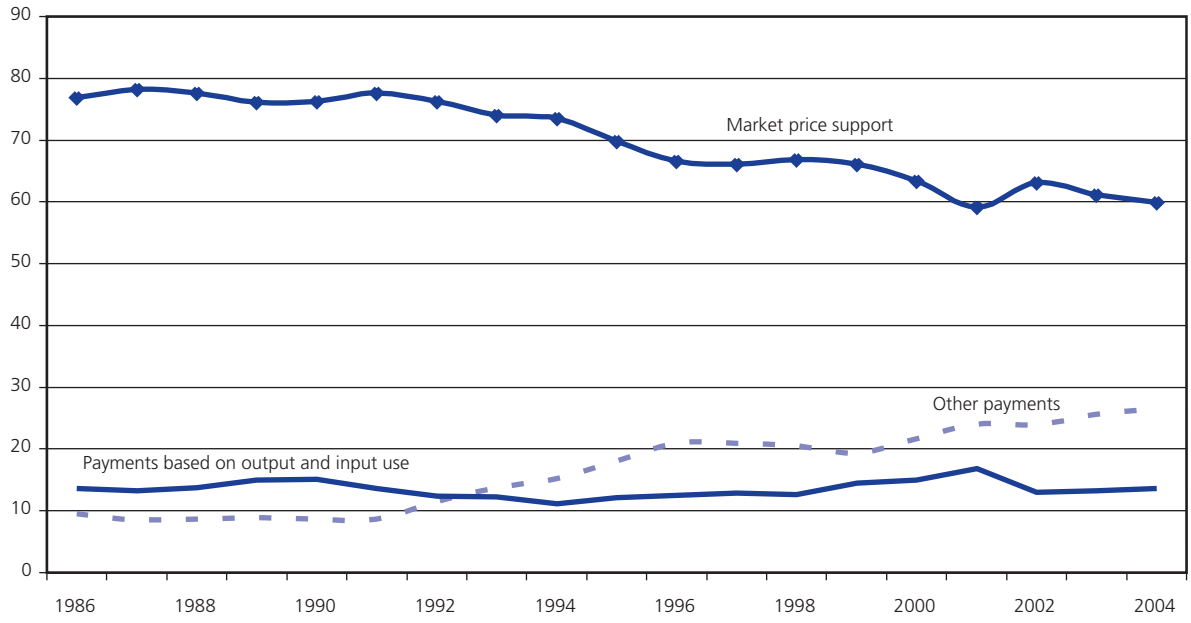
Source: OECD Producer and Consumer Support Estimates, OECD Database 1986-2004.

While total domestic support, and Current Total AMS in particular, have fallen significantly over time, the PSE has remained relatively stable. To discern any downward trend, one needs to look at the PSE in real terms or in terms of its share of the value of agricultural production.

The PSE is further broken down into several components. These include market price support, payments based on output, payments based on area planted/animal numbers, payments based on historical entitlements, payments based on input use, payments based on input constraints, payments based on overall farming income and miscellaneous payments. One can group these components into those that have the strongest influence on production incentives (MPS, payments based on commodity production and input use) and other payments, which have implementation characteristics with less influence on production incentives (payments based on area planted, past production, farm income or provision of environmental services). This allows us to see if there are any discernible trends in the type of support that OECD agricultural producers have received over time.

Chart 12 shows the decomposition of the OECD's PSE. Given its importance in the PSE, we show MPS separately from payments based on output and input use. What can be observed from the figure is the decline in the share made up by market price support and a rise in the share made up by "other payments". MPS declined from 77 per cent of the PSE in 1986 to 60 per cent in 2004. Payments based on output and input use remained fairly constant as a share of the PSE at about 14 per cent. The share of "other payments", which are less production-distorting (and hence less trade-distorting) than the first two, rose from 10 per cent in 1986 to 26 per cent in 2004.

Chart 12
Composition of PSE of OECD member countries, 1986-2004
(Percentages of PSE)



Source: Producer and Consumer Support Estimates, OECD Database 1986-04. Available at http://www.oecd.org/document/54/0,2340,en_2649_33727_35009718_1_1_1_1,00.html.

Greater consistency is found in the WTO and OECD data on agricultural support, where both sources point to a downward trend in the most production and trade-distorting support. Even if nominal support for agriculture in OECD countries as measured by the PSE has remained about the same, there has been a shift away from the most distorting support towards more production or trade-neutral support. This pattern is also observed in the latest OECD report (OECD, 2005f) evaluating the agricultural policies of its members. While it notes that the level of support to OECD producers remains high and has changed little since the mid-1990s, the composition of support has improved with a decline in the most distorting forms of support, such as market price support, and support for general services to agriculture is increasing.

(ii) The PSE by Countries

Table 21 shows the magnitude of producer support estimates given by selected OECD countries. There is a great deal of variance in the amount of support given to OECD countries' agricultural sectors. Australia and New Zealand provide almost no support to their agricultural sector. Bigger OECD members, such as the United States, the EU and Japan, provide support representing between 18 per cent to 56 per cent of agricultural output. A number of small western European countries like Iceland, Norway and Switzerland provide support that reaches almost 70 per cent of the value of their agricultural output.

The OECD data are consistent with the pattern of large variations in support across countries observed in WTO notifications. Agricultural subsidies, as a share of agricultural production, range from 3-4 per cent in Australia and New Zealand to nearly 70 per cent in Norway and Switzerland. In the case of the biggest members (the United States and the EU) the share of subsidies in agricultural production is between one-fifth and one-third.

Table 21
Producer support estimate in selected OECD countries, 2004
(Billion dollars and percentages)

Country	PSE Value	Share of receipts (value of production and support)
Australia	1.1	4
Canada	5.7	21
European Union (15)	133.4	33
Iceland	0.2	69
Japan	48.7	56
Korea, Rep. of	19.8	63
Mexico	5.5	17
New Zealand	0.3	3
Norway	3.0	68
Switzerland	5.8	68
Turkey	11.6	27
United States	46.5	18
OECD	279.5	30

Source: Producer and Consumer Support Estimates, OECD Database 1986-2004 available at http://www.oecd.org/document/54/0,2340,en_2649_33727_35009718_1_1_1_1,00.html.

(g) What do CGE simulations tell us about the incidence of agricultural subsidies?

It is useful to go beyond merely identifying the natural or juridical persons upon whom subsidies are legally vested. This distinction arises because the receipt of a subsidy induces a change in the behaviour of the recipient, which can have an effect on market prices. This consequent change in prices will thereby transmit part of the incidence of the subsidy to persons other than the recipient.

To take an example, the corn farmer who receives a financial outlay from government, the amount of which depends on the volume of corn he produces (an output subsidy), will increase his corn production. If enough additional corn from farmers receiving subsidies comes to the market, it will lower the price of corn, thus benefiting consumers and other users (e.g. the livestock industry which uses corn as animal feed). So while the subsidy will benefit corn farmers, part of the benefit will also be passed on to consumers and downstream industries. The division of the benefits from the subsidy between corn producers on the one hand, and consumers and downstream industries on the other, will depend on the responsiveness of demand and supply the changes in the price of corn (elasticities). Since corn is internationally traded, the incidence of the subsidies will not be confined to the domestic economy but may spill over to foreign consumers, foreign growers of corn and the livestock industry. This will occur if the output subsidy succeeds in lowering not just the domestic price of corn but the world price of corn as well.[236] Under these circumstances, foreign consumers will benefit from the lower price of corn but foreign producers will be hurt.

A complete analysis of the incidence of a subsidy would require examination of the links across different markets and agents. A general equilibrium approach analogous to the classic treatment of tax incidence by Harberger (1962) would often be required. The Doha negotiations have sparked a considerable amount of research interest from economic modellers who have attempted to estimate the welfare gains from further multilateral liberalization. Computable general equilibrium (CGE) models have been widely used to predict

[236] In other words, the country granting the subsidy is a "large country" with the ability to affect world prices.

the likely effects of particular negotiation scenarios.[237] A partial list of the more recent studies, comprising a range of modelling approaches – static and dynamic models, models with perfect competition and those with imperfect competition, models with constant returns to scale or increasing returns to scale – include Francois et al. (2003), Tokarick (2005) and Hertel and Kenney (2005).

Given differences in databases and model structures, the simulations are bound to produce varying estimates of the welfare gains from removing or reducing agricultural subsidies. But despite the variety of modelling approaches employed, a number of common conclusions have emerged from this research. First, the provision of agricultural support creates a welfare loss and the bulk of this loss is incurred by those countries who are the major providers of this support. Thus, the simulations show that it is primarily those countries that provide the most support who benefit from the dismantling of subsidy programmes. Second, there are spillover effects on world markets. Support in rich countries tends to depress world market prices of the most subsidized agricultural commodities. This benefits some countries but hurt others. Net food and agricultural importers benefit from the support provided in rich countries as this tends to lower the cost of their food and agricultural imports. Net exporters of agricultural goods are penalized as they lose market share in third markets or receive prices in world markets that are lower than would have been the case without the support.

(i) Domestic support

Simulations by Tokarick (2005) using the GTAP model showed that the removal of agricultural subsidies in OECD countries would benefit those countries the most. Tokarick used the payments based on output and input use from the OECD's PSE as the measure of domestic subsidies to the agricultural sector. He found that the removal of domestic and export subsidies in OECD countries would increase developed countries' welfare by about US$14.1 billion (in 1997 dollars). Developing country net exporters like Argentina, Brazil and India gained but net food-and agriculture-importing developing countries suffered welfare losses because of the adverse terms of trade effect. Developing countries as a whole lost out by US$4.7 billion (in 1997 dollars) so that the welfare gains for the world as a whole amounted to US$9.4 billion (in 1997 dollars).

Hertel and Keeney (2005) examined the same question on the impact of reducing trade distortions in world agricultural markets using a variant of the GTAP model. This variant (GTAP-AGR) includes alternative representations of factor mobility and substitution in production, crop-livestock sector interactions, consumer food demand and trade elasticities, which more closely reflect the economic conditions in the agricultural sector. Like Tokarick, they have stripped out market price support (MPS) from the OECD's PSE to obtain a measure of domestic support. The removal of domestic support by developed countries increased global welfare by US$ 2.8 billion (in 2001) with 87 per cent of the benefits going to these countries. In contrast to the result obtained by Tokarick, developing countries experienced a welfare gain of US$284 million (in 2001). However, those gains masked differences in outcomes between net food and agriculture importers and exporters. Developing country agricultural exporters like Argentina and Brazil reaped the bulk of the benefits. Major developing country losers from the removal of domestic support were China and countries from North Africa and the Middle East, which are traditionally net importers of food and agricultural products.

Finally, Francois et al. (2003) developed a dynamic CGE model with increasing returns to scale in the manufacturing sector to examine the effects of the Doha negotiations.[238] They found that the removal of domestic support in the OECD countries produced welfare gains for those countries in the neighbourhood of US$16.1 billion. However, they also found that the removal of domestic support lowered welfare in developing countries. Unlike the other simulations, this occurred irrespective of whether developing countries were net exporters or importers of food and agricultural products. The reason for this part of their result arises from

[237] This is not to downplay work using partial equilibrium models to simulate particular elements of the negotiations. For example, Hoekman et al. (2004) have used a partial equilibrium approach to compare the benefits from tariff liberalization and reduction in domestic and export subsidies in the agricultural sector. On the specific question of the effect of reducing domestic support in agriculture, their results show that the bulk of the welfare gains accrue to industrialized countries (see Table 8 of their paper). They also find that developing countries would suffer a welfare loss, although LDCs would experience a small welfare gain.

[238] See also a later paper by Francois et al. (2005).

the assumption that there is monopolistic competition and increasing returns to scale in manufacturing. Global reform in agriculture leads to a re-allocation of resources in developing countries into agriculture from other sectors, including manufacturing. This process introduces negative scale effects by raising marginal and average costs in manufacturing.

These results underscore the importance of going beyond a description of the pattern of subsidy payments. In the absence of positive externalities or other market failures in the agricultural sector, transfers from taxpayers to agricultural producers involve a net welfare loss to society. The discussion in part (d) has told us how much these transfers have been, which countries have spent the most, and on what commodities. But beyond the magnitude and pattern of the payments is the resulting efficiency losses from these transfers within the country and the welfare impact, both positive and negative, on other trading nations.

(ii) Export subsidies

Similarly, the results of recent CGE simulations on the trade and welfare effects of subsidy removal in agriculture give an indication of the transmission of export subsidies to producers other than those receiving them as well as to consumers. Tokarick (2005) finds that the elimination of agricultural tariffs in OECD countries would generate welfare gains for the world that are almost ten times larger than the US$9.5 billion (at 1997 prices) of benefits flowing from the removal of both production and export subsidies (no separate effects are given). The welfare effects of export subsidy elimination alone have been contrasted with the effects of tariff reductions in an earlier study by Laird et al. (2003). Using the same database as Tokarick (2005), but adjusting it to account for preferences, export subsidy removal results in a global welfare loss of about US$1.9 billion (at 1997 prices). This contrasts with a welfare gain of about US$21.5 billion (at 1997 prices) resulting from a 50 per cent tariff cut in agricultural tariffs. The explanation for these results is threefold. First, net food-importing countries, especially in the developing world, lose from adverse terms-of-trade shocks from higher world prices, thus diminishing the efficiency gains from export subsidy removal. Second, tariffs apply to a wider range of goods than subsidies, which are provided only to selected products and by few countries, and all countries unambiguously benefit from their removal in OECD countries. Finally, export subsidy effects are confined to the removal of direct payments (mainly used by the EU), i.e. possible export subsidy equivalents of export credits (used, for instance, by the United States) as well as state trading and food aid are not taken into consideration.

Hertel and Keeney (2005) provide disaggregate effects by the type of subsidy that is removed. While high-income countries gain about US$2.6 billion (at 2001 prices) from export subsidy removal, transition and developing country economies lose about US$1.5 billion (at 2001 prices). The only developing countries gaining from the elimination of farm export subsidies are Argentina, Brazil and India, since numerous other developing countries, especially in Sub-Saharan Africa, are net importers of the subsidized products (particularly grains and dairy). Hertel and Keeney (2005) are of the opinion that the overall loss to developing countries of just over US$1 billion (at 2001 prices) is not much in contrast to the gains from enhanced market access, especially to advanced economies. While this may be true, this loss is still about four times as large as the positive impact that developing countries could experience from domestic support reductions in the OECD. And even the latter gains amount to only one-quarter of the benefits that developing countries would obtain from their own tariff liberalization.

Finally, Anderson et al. (2005) employ the recursive dynamic LINKAGE model of the World Bank to simulate a range of possible Doha scenarios against a baseline projection for the year 2015. The same database is used as in Hertel and Keeney (2005) and their results are very similar with export subsidy elimination playing only a minor role in total welfare gains and harming a number of food-importing developing countries. For instance, one scenario that assumes cuts in agricultural domestic support in four major developed country markets and abolition of agricultural export subsidies in all countries, plus a 50 per cent cut in all tariffs on non-agricultural products for developed countries, 33 per cent for developing countries and none for least-developed countries, is compared to the same scenario with the exception that export subsidies would be retained. The gains for the whole world in 2015 would virtually remain the same at US$96 billion (again, all results at 2001 prices) if export subsidies were not reduced. The same is true for the principal "winners" among developing countries, such as Argentina (gains of US$1.3 billion with, US$1.2 billion without export

subsidy elimination), Brazil (US$3.6 billion and US$3.5 billion respectively), India (US$2.2 billion unchanged) and Thailand (US$2 billion unchanged). Developing countries as a group would lose US$5.4 billion if export subsidies are eliminated, which is again explained by the terms-of-trade deteriorations experienced by net food importers, such as China (gains of US$1.7 billion with, US$2.6 billion without export subsidy elimination) and Sub-Saharan Africa (minor effects versus US$700 million if export subsidies remain in place).

(h) Future evolution of agricultural subsidies

The trends in domestic support and export subsidies that have been observed in this Report and the agreements reached at the Hong Kong Ministerial Conference, particularly on export subsidies, provide grounds for optimism that the reduction in the most trade-distorting support in the agricultural sector would not only continue in the future but perhaps even accelerate.

In Hong Kong, Members agreed on the elimination of all forms of export subsidies by the end of 2013 and disciplines on all export measures with equivalent effect to be completed by the same date, as mentioned above. In the case of domestic support, there are signs of substitution away from the most trade-distorting of domestic support towards "decoupled" support.

But while there are good reasons to believe that decoupled payments are less distorting than output subsidies or price support, they are not entirely production-neutral. There are a range of non-price effects, such as the effect of these policies on the level of risk faced by producers (wealth and insurance effects) or the incentives to exit farming, which can be significant (see for instance De Gorter et al., 2004, and OECD, 2005g). Empirical studies have tended to confirm the existence of a production impact of decoupled payments.[239]

If farmers do not receive assistance from the government, a price of farm output that is not enough to cover fixed costs of production would lead to exit from farming altogether. With decoupled payments, this exit may not occur, thus preventing the market from performing its function of weeding out uncompetitive farms. Farmers who are provided decoupled payments obtain a claim on future income which increases their net wealth. The increase in wealth can affect farm investment decisions through better access to loans. Lenders are more willing to make loans to farmers with higher guaranteed incomes since they will be perceived to have a lower risk of default. This increased access to financing can facilitate additional investments in agricultural production. Farmers will also be more able to self-finance some of their investments in agricultural production, which may have been constrained in the past because of debt or limited liquidity. Finally, an increase in wealth can change the appetite for risk-taking so that farmers are more willing to plant riskier crops or take on riskier strategies, which have higher expected production outcomes.

239 Chavas and Holt (1990) developed an acreage response model for corn and soybeans during the 1954-85 period which uses wealth as one of the explanatory variables (wealth is defined as proprietor equity in agriculture multiplied by the share of farm acreage planted to the crops). They obtain an acreage elasticity of 0.086 for corn and 0.27 for soybeans. This means that a 10 per cent increase in wealth led to an increase of 0.86 per cent in corn acreage and to an increase of 2.7 per cent in soybean acreage. Young and Westcott (2000) take these coefficients and used them to estimate the impact of the Production Flexibility Contracts (PFC) on acreage. They estimated that the programme added between 180,000 to 570,000 acres across all seven crops (cotton, corn, wheat, barley, oats, sorghum and rice). The third study by Hennessy (1998) simulated the effect of removing all decoupled payments (under the PFC) on corn. The result is a reduction in corn production of between 1.5 per cent to 2.5 per cent.

Appendix Table 3
Final bound total AMS by Member

Member	Final implementation year	Currency	Final bound total AMS
Argentina	2004	In $ of 1992	75,021,292.4
Australia	2000	$A million	471.9
Bolivarian Rep. of Venezuela	2004	US$'000	1,130,667.0
Brazil	2004	US$'000	912,105.2
Bulgaria	2001	ECU million	520.0
Canada	2000	Can$ million	4,301.0
Colombia	2004	US$'000	344,733.0
Costa Rica	2004	US$'000	15,945.0
Croatia	2004	€	134,116,772.0
Cyprus	2004	£C million	50.6
Czech Republic	2000	Kc million	13,611.3
European Union (15)	2000	€ million	67,159.0
Former Yugoslav Rep. of Macedonia	2003	€ million	16.3
Hungary	2000	Ft million	33,808.0
Iceland	2000	SDR million	130.1
Israel	2004	US$'000	568,980.0
Japan	2000	¥ billion	3,972.9
Jordan	2006	JD	1,333,973.0
Korea, Republic of	2004	W billion	1,490.0
Lithuania	2005	US$ million	94.6
Mexico	2004	Mex$ 1991 million	25,161.2
Moldova	2004	SDR million	12.8
Morocco	2004	DH million	685.0
New Zealand	2000	$NZ million	288.3
Norway	2000	Nkr million	11,449.0
Papua New Guinea	2004	US$ million	34.2
Poland	2000	US$ million	3,329.0
Saudi Arabia	2015	Saudi riyals million	3,218.3
Slovak Republic	2000	Sk million	10,140.0
Slovenia	2000	ECU '000	61,845.7
South Africa	2000	R million	2,015.4
Switzerland-Liechtenstein	2000	SF million	4,257.0
Taipei, Chinese	2000[a]	NT$ million	14,165.2
Thailand	2004	B million	19,028.5
Tunisia	2004	D million	59.3
United States	2000	US$ million	19,103.3

[a] Member as of 1 January 2002. Taipei, Chinese committed to complete the phase-downs of its total AMS by the year 2000.
Source: WTO documents TN/AG/S/13 and WT/ACC/SAU/61/Add.1 part 2.

Appendix Table 4

Notified use of budgetary outlays for each product in national currency and as a percentage of the relevant annual commitment level, selected Members and most recent available year

	Outlays	Share of outlays	Share of commitments
European Union (15) (2001)	Million euros	per cent of total	per cent
Wheat and wheat flour	8.5	0.3	1
Coarse grains	112.8	4.4	11
Rice	30.3	1.2	82
Rapeseed	0.0	0.0	0
Olive oil	0.0	0.0	0
Sugar	482.8	18.8	97
Butter and butter oil	324.9	12.6	34
Skimmed milk powder	36.7	1.4	13
Cheese	188.6	7.3	55
Other milk products	402.2	15.6	58
Beef meat	388.4	15.1	31
Pig meat	20.0	0.8	10
Poultry meat	60.2	2.3	66
Eggs	6.0	0.2	14
Wine	22.9	0.9	58
Fruit and vegetables, fresh	20.8	0.8	38
Fruit and vegetables, processed	3.6	0.1	43
Raw tobacco	0.0	0.0	0
Alcohol	52.8	2.1	55
Incorporated products	411.6	16.0	99
Total	2573.1	100.0	-
Switzerland-Liechtenstein (2000)	Million SF	per cent of total	per cent
Produits laitiers	184.5	58.0	65
Bétail d'élevage et chevaux	2.8	0.9	13
Fruits	17.6	5.5	105
Pommes de terre	1.6	0.5	70
Produits transformés	111.8	35.1	97
Total	318.3	100.0	-
United States (2002)	Million $	per cent of total	per cent
Wheat	0.0	0.0	0
Coarse grains	0.0	0.0	0
Rice	0.0	0.0	0
Vegetable oils	0.0	0.0	0
Butter and butter oil	15.5	49.2	51
Skimmed milk powder	14.8	46.9	18
Cheese	1.2	3.9	34
Other milk products	0.0	0.0	0
Bovine meat	0.0	0.0	0
Pig meat	0.0	0.0	0
Poultry meat	0.0	0.0	0
Live dairy cattle (head)	0.0	0.0	0
Eggs (dozen)	0.0	0.0	0
Total	31.5	100.0	-
Norway (2001)	Million NOK	per cent of total	per cent
Bovine meat	12.8	4.4	37
Swine meat	13.4	4.6	15
Sheep meat	4.5	1.6	25
Poultry meat	0.0	0.0	0
Egg and egg products	17.0	5.9	99
Butter	16.2	5.6	30
Cheese	198.5	68.5	81
Whey powder	0.0	0.0	0
Fruit and vegetables	0.0	0.0	0
Honey	0.0	0.0	0
Processed agricultural products	27.2	9.4	75
Total	289.6	100.0	-

Source: WTO Secretariat.

3. INDUSTRY

In this subsection, the term industry is defined loosely as all that is not agriculture or services in the WTO sense. It includes the fisheries, forestry and mining sectors, among others, but does not include food and beverages or construction. As discussed in Section D above, the arguments for using subsidies differ significantly across sectors and across countries and so does the incidence of subsidies. In the absence of a comprehensive set of data allowing a comparison across countries, the discussion in this Section relies on four main sources of information. The first source is the subsidy notifications under the WTO's SCM Agreement which as explained above only provides a patchy and incomplete description of the subsidies landscape. The second group of sources includes the Australian Productivity Commission's Trade and Assistance Reviews and the EU's State Aid Scoreboard, which covers the EU (15) plus the 10 new EU Member States. These sources provide very interesting examples of subsidy policies. Unfortunately, however, these examples do not tell us much about the incidence of subsidies in other regions of the world. To the best of our knowledge, no other country provides the kind of information that can be found in either the Trade and Assistance Reviews or the State Aid Scoreboard which both focus on trade-distorting subsidies. The third source is national budget data. The problem here is that only very few countries provide disaggregated information on subsidies. In most cases, only broad aggregates including all sorts of subsidies are available. The fourth and last source of information used to describe the industrial subsidies landscape is regional or country case studies. They typically provide interesting stylized facts rather than quantitative information. Two industries are discussed in more detail: fisheries and coal. The case of fisheries is of particular interest for various reasons. First, the OECD provides information on fisheries subsidies that is comparable across countries. Second, fisheries subsidies are currently being discussed in the WTO. Finally, the case of fisheries subsidies illustrates how subsidies serve a variety of purposes both for a given country and across different regions. The case of coal provides an interesting example of adjustment-related subsidies but it also illustrates more generally the evolution of industrial policies and subsidies in a crucial industry.

(a) Industrial subsidies by country and region

Overall, notification figures show the diversity of the situations but fail to provide a very clear and reliable description of the industrial subsidies landscape. Over the period 1995 to 2002, a total of 54 economies (including the European Communities and its Member States) notified quantitative information on industrial and/or horizontal subsidies to the WTO under the SCM notifications requirement. For the reasons explained above, the figures in Appendix Table 5 should be interpreted with considerable caution. The median value of the industrial subsidies to GDP ratio for this sample is slightly less than 0.2 per cent. Four countries report a ratio of industrial subsidies to GDP in excess of 1 per cent in 2002 (Hungary, Israel, St Lucia and St Vincent & the Grenadines). According to the notifications, Canada, Japan and the United States provide relatively few subsidies to industry, while the EU is among the reporters which provide relatively large amounts of subsidies to industry. With more than one half of one per cent, the EU ratio is almost three times larger than the median value of the sample. The weighted sample average of the subsidies to GDP ratio has declined from 0.26 to 0.2 between 1995 and 2002. A relatively clear downwards trend can be distinguished in less than one-third of the countries. Notified industrial subsidies expressed as a share of GDP decreased, for example, in Brazil, Japan, the Republic of Korea, Latvia and Thailand. They increased in about five countries, including Chinese Taipei, Saint Lucia and Switzerland. In most of the others it is difficult to identify any trend.

To obtain a better sense of the situation and the evolution over time of industrial subsidies, we now turn to national sources. There are two main problems with those sources. First, only very few countries provide both comprehensive and detailed information. Second, data are usually not comparable across countries. We rely here on the Australian and EU sources referred to above.

The Australian Productivity Commission's (PC) Trade and Assistance Review provides an interesting complement to the information in the notifications. The PC data provide a richer but sometimes different picture of Australian subsidies from the one provided by notifications. First, the total amount of horizontal and industrial subsidies notified to the WTO has typically been less than half the level of total budgetary assistance to the industrial sector as reported in the PC Report. Second, Australian budgetary assistance to industry expressed as a share of GDP has declined from 0.37 per cent to 0.30 per cent between fiscal years 1999-00 and 2003-04,

while notifications show an increase over the same period. Budgetary assistance data which are more detailed than the notifications show that this decrease reflects the reduction in the level of assistance to manufacturing and mining. As can be seen in Table 22, budgetary assistance to manufacturing and mining had already started decreasing in the second half of the 1990s. Assistance to fisheries and forestry remained fairly stable between 2000 and 2004. The PC Report also compares budgetary assistance with assistance provided by tariffs. In 2003-04, tariffs provided the equivalent of an estimated US$5.33 billion of assistance on outputs which was virtually all directed to industries in the manufacturing sector.[240] This figure is considerably larger than the US$1.27 billion of budgetary assistance to the manufacturing sector for the same period.

Table 22
Australia: Budgetary assistance by industry, 1995/96 – 2003/04

	95/96	96/97	97/98	98/99	99/2000	2000/01	01/02	02/03	03/04
					Percentage share of GDP				
Total industry	...	...	...	...	0.37	0.33	0.36	0.33	0.30
Fisheries	...	...	...	...	0.01	0.00	0.01	0.01	0.01
Forestry and logging	...	...	...	...	0.01	0.00	0.01	0.01	0.01
Mining	0.06	0.08	0.05	0.04	0.04	0.03	0.03	0.02	0.01
Manufacturing	0.34	0.32	0.26	0.26	0.27	0.25	0.27	0.23	0.22
					Percentage of government expenditure				
Total industry	...	...	...	...	2.01	1.85	2.03	1.81	1.69
Fisheries	...	...	...	...	0.05	0.05	0.06	0.06	0.06
Forestry and logging	...	...	...	...	0.03	0.02	0.03	0.03	0.04
Mining	0.30	0.45	0.29	0.24	0.22	0.18	0.17	0.13	0.08
Manufacturing	1.81	1.74	1.41	1.42	1.51	1.38	1.53	1.30	1.22

Note that we exclude agricultural and services subsidies but include fisheries and forestry subsidies in "Total industry". Manufacturing subsidies include subsidies to "food, beverages and tobacco".
Source: Australian Government, Productivity Commission, Trade & Assistance Review, various issues and WTO calculations.

Total state aid by EU (15) Members less aid to agriculture, fisheries and transport decreased substantially from the mid-nineties (1995-97) to the end of the decade (see Table 23). Since then, the ratio of subsidies to GDP has remained stable.[241] This measure, which includes state aid to services but does not include state aid to fisheries, only approximates state aid to the industrial sector as defined in this study. State aid to services accounted for about 7.1 per cent of the above-mentioned total in 2004 while state aid to fisheries, if included, would have added between one and two per cent to the total. As already mentioned, state aid is defined as a form of state intervention used to promote a certain economic activity. It does not include general measures and public subsidies that have no effect on trade. Also, state aid statistics do not include Community subsidies. On average, for the EU (15) over the period 2001 to 2003, grants represented more than two thirds of state aid to manufacturing and services, while tax deferrals and tax exemptions represented about one quarter of the same total.

Despite some convergence between new and EU (15) Member States, Table 24 shows that differences among EU Members remain significant. While for the period 2000 to 2003 state aid as a percentage of GDP was significantly higher in the ten new EU-Member States (1.38[242]) than in the EU (15) (0.43), the difference was considerably lower in 2004 (see Table 24).[243] Between 2000 and 2003, the level of State aid increased from €5 billion to €9.2 billion as a result of very large awards of aid to the Czech banking sector and the Polish coal sector. In 2000-2003 disparities among the new Member States were relatively important with State aid reaching 3.5 per cent of GDP in Malta against 0.1 per cent of GDP in Estonia. The high figure for Malta reflected significant restructuring aid to shipbuilding and the ship-repair sector. As all these restructuring measures were being phased out under transitional arrangements or limited in time, state aid figures for new Members converged somewhat towards those of EU (15) Members in 2004.

240 Net tariff assistance, that is tariff assistance to output minus tariff assistance to inputs reached approximately US$3.5 billion. See Trade and Assistance Report 2003-04.

241 The source for 2000-03 data is EC (2005) State Aid Scoreboard Report, Spring 2005 update.

242 Weighted average.

243 Total state aid less state aid to agriculture, fisheries and transport.

Table 23
European Union (15) state aid, 1992–2004
(Billion euros and percentages)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
							Billion Euros						
Total state aid less agriculture, fisheries and transport	57.1	64.3	58.9	57.0	56.7	76.2	48.8	38.5	40.9	42.5	46.8	39.4	42.0
of which:													
Manufacturing	...	...	...	...	...	...	...	...	24.3	21.5	24.9	29.0	33.5
Services	...	...	...	...	...	...	...	...	2.1	3.4	2.9	3.2	3.0
Coal	...	...	...	...	...	...	...	...	7.6	6.0	5.4	5.3	5.1
Other non-manufacturing	...	...	...	...	...	...	...	...	3.5	2.6	1.0	0.0	0.5
Fisheries	...	...	...	0.3	0.2	0.2	0.3	0.3	...	...	...	...	0.5
							Percentage share of GDP						
Total state aid less agriculture, fisheries and transport	0.8	0.9	0.8	0.7	0.7	0.9	0.6	0.4	0.4	0.5	0.5	0.4	0.4

Source: European Commission Spring and Autumn 2005 updates and State Aid Scoreboard website, http://europa.eu.int/comm/competition/state_aid/scoreboard/

Table 24
European Union (15) and new Member States' state aid, 2004
(Billion euros and percentages)

	Total State aid less agriculture, fisheries and transport				
	Value	% of GDP		Value	% of GDP
EU (15)	42.00	0.4			
New Members (10)	3.40	0.7			
EU (25)	45.50	0.4			
Belgium	0.70	0.2	Luxembourg	0.00	0.2
Czech Republic	0.20	0.2	Hungary	0.70	0.9
Denmark	1.00	0.5	Malta	0.10	2.7
Germany	15.10	0.7	Netherlands	0.90	0.2
Estonia	0.00	0.1	Austria	0.50	0.2
Greece	0.30	0.2	Poland	2.00	1.0
Spain	3.10	0.4	Portugal	1.10	0.8
France	6.30	0.4	Slovenia	0.10	0.5
Ireland	0.40	0.3	Slovakia	0.20	0.6
Italy	5.40	0.4	Finland	0.60	0.4
Cyprus	0.10	1.1	Sweden	2.20	0.8
Latvia	0.00	0.2	United Kingdom	4.20	0.3
Lithuania	0.00	0.1			

Source: European Commission (2005) State Aid Scoreboard, Autumn 2005 update, COM(2005) 624 final.

The State aid figures discussed so far do not include subsidies granted by way of the main Community operations. The main Community funds, instruments and programmes that accounted for about two-thirds of the Community budget in 1998 include the Structural Funds, the guarantee section of the European Agricultural Guidance and Guarantee Fund (EAGGF), the Cohesion Financial Instrument and the Cohesion Fund, the Community Research and Technological Development Framework Programme, the European Coal and Steel Community financial operations (expired in July 2002), the European Investment Bank and the European Investment Fund. The Structural Funds, out of which payments for a total of €26 billion were implemented in 2003, include the European Regional Development Fund, the European Social Fund, the Guidance Section of the EAGGF, and the Financial Instrument for Fisheries Guidance. One-third of Structural Funds assistance is used to improve basic infrastructure, one-third goes to human resources and slightly less than one-third serves to improve the productive environment. The rest (2.8 per cent) is used for technical

assistance and innovative measures. A more detailed breakdown shows that forestry and fisheries each get about one per cent of total Structural Funds Assistance.[244]

As already mentioned, one other source of information on subsidies is national statistics and in particular disaggregated statistics on public expenditures. Unfortunately, only very few countries provide data on subsidies by either sector or objective. Moreover, this information is hardly comparable across countries. Three examples are nevertheless presented here. Colombia provides a very detailed disaggregation of its subsidies by industry (including agriculture and services). It shows that in 2002, the industrial sector accounted for only 3.5 per cent of all subsidies and that almost all of the industrial subsidies went to the mining industry. As shown in Appendix Table 7, the rest of the subsidies went mainly to services and in particular financial services and to utilities and in particular electricity. Brazil also provides information on subsidies by industry. In Brazil's case, as shown in Appendix Table 6 industrial subsidies account for slightly less than one-quarter of total subsidies and almost all of it is for the manufacturing sector. The third example is India, which provides a breakdown of its expenditure budget. Figures for 2004-05 show that food subsidies account for more than half of total subsidies while fertilizers account for one-third and petroleum for about 8 per cent of the same total. Subsidies to shipyards account for 0.04 per cent of total subsidies.[245]

Melo (2001) documents a turning point in industrial policies in the Latin American and Caribbean countries during the mid 1990s and attempts to characterize the emerging trend in business promotion policies in the region. The information provided is qualitative, but Melo also indicates broad trends. Three types of measures are discussed: (a) export promotion policies; (b) policies to promote output growth and investment; and (c) policies to promote higher productivity and competitiveness. Regarding export promotion policies, Melo notes that the main feature of the new pattern of fiscal incentives in the region is the diminishing role of subsidies. While a few subsidies remain, the dominant trend is towards their complete disappearance and their replacement with other measures (see below). As regards fiscal and financial incentives to production and investment, Melo notes that the emerging set of industrial policies assigns no significant role to tax incentives. In Latin American countries, tax incentives are a minor phenomenon. Another notable feature of the new policies is that the use of subsidies is not widespread.[246] The paper also includes a detailed description of incentives to promote growth and competitiveness, and in particular of policies to promote technological development as well as a detailed description of policies to promote Small and Medium size Enterprise (SME) development.

(b) Industrial subsidies by type of beneficiary

Among subsidy programmes notified under the SCM Agreement, a distinction can be made between those that are horizontal and those that are industry-specific (see Appendix Table 8). Industry specific subsidies differ from horizontal subsidies in that the latter are typically available across the board instead of being targeted to one particular industry.[247] Horizontal subsidies are generally categorized by functions or objectives and would typically include environmental and energy-saving subsidies, research and development subsidies, support to regional development, support to small and medium sized enterprises, support for human capital development, etc. Because there are reasons to believe that a substantial share of horizontal subsidies benefit firms in the industrial sector, they are discussed in this subsection.

A majority of countries notified more horizontal than industry-specific subsidies. Among the richer countries, the European Union notified a total of US$39 billion in horizontal programmes and a total of US$6 billion in subsidies to specific industries in 2002, while the United States notified respectively US$7 billion for horizontal and US$1 billion for industry-specific programmes. Japan, on the other hand, notified exclusively industry-specific programmes and their value decreased progressively from US$2.3 billion in 1995 to US$0.5 billion in 2002. A

244 See European Commission (2004b) 15th Annual Report on the Implementation of the Structural Funds, COM(2004) 721 final, Brussels: EC.

245 Note that these subsidies are most likely more transfers to consumers than subsidies to farmers.

246 Melo (2001) provides interesting details regarding the Chilean regionally-targeted subsidy schemes.

247 As already mentioned, in a number of ambiguous cases, the allocation of programmes amongst categories was left to the discretion of the authors.

majority of EU (15) Member States, including the largest ones, and most of the ten new Members, notified more horizontal than industry-specific subsidies. With respectively US$385 million and US$288 millions notified in 2002 for horizontal programmes, Brazil and Chile stand out among the 11 countries in South or Central America. Brazil was also the only country in this region with a substantial reduction of the amount notified – it was reduced tenfold between 1995 and 2002. Saint Lucia and Saint Vincent & the Grenadines on the contrary notified only industry-specific programmes and the amounts notified increased substantially. In Asia, Thailand only notified horizontal subsidies which decreased over time, while the Republic of Korea notified large but steadily decreasing industry-specific subsidies. On the other hand, Chinese Taipei's industry-specific subsidies increased from US$4 million in 1996 to more than US$1 billion in 2002.

Australian budgetary assistance statistics provide interesting complementary information. Budgetary assistance is broken down into six categories of which one is a residual. In 2002-03, industry-specific measures accounted for 44 per cent of total budgetary assistance, R&D accounted for 28 per cent and general export measures accounted for 15 per cent. Tax exemptions under the Automotive Competitiveness and Investment Scheme were the single most important industry-specific budgetary assistance program.

Table 25
Australia: Budgetary assistance to industry by activities targeted, 2002-03
(Million dollars and percentages)

	Forestry and logging	Fishery	Mining	Manufacturing	Total	Share in %
Industry-specific measures	9.6	..	0.2	525.0	534.7	44.1
Rural R&D measures	2.7	10.2	..	..	12.9	1.1
Sector-specific measures	2.1	20.3	..	..	22.4	1.8
General export measures	0.1	0.3	2.2	175.9	178.5	14.7
General investment measures	..	0.9	45.6	35.3	81.8	6.7
General R&D measures	8.9	19.1	53.1	257.4	338.4	27.9
Other measures	0.1	0.6	0.1	43.4	44.2	3.6
Total	23.5	51.3	101.1	1037.0	1212.9	100.0

Source: Australian Government, Productivity Commission, Trade & Assistance Review, 2003-04.

While EU state aid figures for 2000-2003 showed a striking contrast between EU (15) Members and new EU Members, the difference is much smaller in 2004 (see Table 26). On average for the EU (15) over the period 2000-03, three-quarters of the state aid went to horizontal objectives and only one-quarter was handed out to specific industries.[248] For the new Members, the proportions were more or less inverted. Three-quarters of total state aid went to specific sectors while only one-quarter was spent on horizontal objectives. In line with commitments undertaken at various European Councils, EU (15) Member States have redirected aid towards horizontal objectives. In the new Member States, the share of pre-accession aid to horizontal objectives was relatively low because of the strong support to several industries including coal, steel and the financial sector in the context of privatization or to ensure viability. Figures for 2004 (see Table 26) show that the share of horizontal aid has increased substantially in the new Member States.

Table 26
European Union (15): Share of state aid for horizontal objectives in total state aid, 2000-03 and 2004
(Percentage)

	2000-03	2004
Czech Republic	10	82
Cyprus	23	46
Estonia	100	100
Hungary	41	45
Latvia	31	100
Lithuania	5	49
Malta	6	8
Poland	29	26
Slovenia	72	70
Slovakia	28	35
New Members (10)	24	...
EU (15)	73	...
EU (25)	...	76

Source: European Commission (2005a) State Aid Scoreboard, Spring 2005 and Autumn 2005 updates.

248 See a more detailed disaggregation in Appendix Table 9.

As already mentioned, the qualitative survey of industrial policies in Latin America and the Caribbean countries suggests that the late 1980s and the 1990s represented a transition from the industrial policies of the import substitution model to industrial policies suitable for outward-oriented economies. The study documents the replacement of traditional direct subsidies and fiscal incentives with various other measures and in particular export processing zones (EPZs), grants and fiscal incentives aimed at promoting technological modernization, and policies to promote SME development.[249]

(c) Industrial subsidies by subsector

Mining, coal, steel, forestry, fisheries, shipbuilding, aviation and the automotive industry figure most prominently in SCM notifications. Eastern European countries typically notified programmes in mining and coal. Subsidies to the steel industry were listed by only four European countries. Forestry programmes were notified by Argentina, Bulgaria, Denmark, Hungary, Republic of Korea, Norway and the United States. Unfortunately, available data do not reflect any clear trend in the evolution of forestry subsidies over time. They were progressively phased out in the Republic of Korea and reduced in Norway but remained fairly stable in the United States and increased in Hungary. A total of 11 developed countries, including seven EU (15) Member States notified subsidies to shipbuilding. As for aviation, it was listed by four EU (15) Members. A few EU (15) Members also notified subsidies to high-tech industries, sometimes specifically for R&D, such as bio-tech or micro-electronics.

As shown in Table 27, Australian Government budgetary assistance varies markedly among sectors, with the largest proportion directed to the manufacturing sector. The motor vehicles and parts industry receives the largest share of assistance both in absolute terms and relative to its gross value added. This assistance is provided through tariff concession schemes, and in particular through the Automotive Competitiveness and Investment Scheme. This Scheme, which started in 2001 and has recently been extended to 2015, provides transferable credits based on participants' domestic production, investment in plant and equipment, and in some cases investment in research and development. These credits can be used to reduce the customs duty payable on eligible imports. Other important beneficiaries of subsidies include the textiles and clothing industry, metal product manufacturing and petroleum, coal, chemical and associated products.

Table 27
Australia: Budgetary assistance by industry grouping, 2003-04
(Million US dollars)

	Budgetary outlays	Tax concessions	Total assistance
Fisheries	42.7	22.4	65.1
Forestry and logging	34.4	2.7	37.1
Mining	63.3	20.0	83.3
Manufacturing	553.3	711.1	1264.5
Food, beverages and tobacco	60.8	12.6	73.3
Textiles, clothing, footwear and leather	97.5	47.9	145.4
Wood and paper products	19.4	3.0	22.3
Printing, publishing and media	11.7	1.0	12.8
Petroleum, coal, chemical and associated products	94.9	9.5	104.5
Non-metallic mineral products	0.7	3.3	4.0
Metal product manufacturing	105.9	12.4	118.4
Motor vehicles and parts	2.2	478.5	480.7
Other transport equipment	14.1	32.4	46.5
Other machinery and equipment	49.0	20.9	70.0
Other manufacturing	69.2	14.5	83.6
Unallocated manufacturing	27.8	75.2	103.1

Source: Australian Government, Productivity Commission, Trade & Assistance Review, 2003-04 and author's calculations.

Currently available state aid data for EU Members do not provide an accurate picture of the final recipients of the aid. Appendix Table 10 nevertheless shows that the distribution of state aid across sectors varies

[249] See Rodrik (2004), Table 2, which expands to Asia and Africa an illustrative list of industrial policies in support of production and investment originally provided by Melo (2001) for Latin America and the Caribbean countries.

considerably among Member States. Eight countries provide state aid to the coal industry (see below). The share of manufacturing (including processed food) in total state aid varies between 13 per cent in the case of Portugal and 98 per cent in the case of Slovakia. Note that these shares include aid to specific sectors such as steel, shipbuilding or other manufacturing sectors, aid for general economic development and aid for horizontal objectives including research and development, SMEs, environment, energy saving, employment and training for which the specific sector is not always known. State aid to fisheries never exceeds 3 per cent of total state aid as support to fisheries is mainly provided through EU structural funds.

Appendix Table 9 provides a detailed breakdown of sectoral aid for the EU (15) and the new Member States in 2000-2003. It shows that coal accounts for most of industry-specific aid in the EU (15) but only for one-third in the new Member States, even if its share in total subsidies is larger for the new Members. The amount of state aid to the shipbuilding sector declined from an annual average of €1151 million for the period 1999-2001 to €658 million for the period 2001-2003. The highest amounts of aid were given to the restructuring of public yards in Spain in 2000. In 2003, a total of €685 million was granted to the EU (15) shipbuilding sector. Some 55 per cent of the overall figure constituted operating aid and represented essentially the use of the temporary defensive mechanism schemes approved by the Commission permitting exceptionally and temporarily direct aid in support of contracts for the building of container ships, chemical and product tankers and LNG carriers. Among the new Members, only Malta provides substantial aid to shipbuilding while only Slovakia and to a far lesser extent the Czech Republic subsidize the motor vehicle industry. Four of the ten new Members provide aid to the steel sector.

Various studies also provide often mainly qualitative information on subsidy schemes. For instance, in his survey of the main financial and fiscal incentives to production and investment in Latin American and Caribbean countries, Melo (2001) lists the specific sectors that benefit from loans or tax incentives. Among industrial sectors (excluding services and agriculture), those that are listed most frequently include primary industries and in particular forestry and mining, and cultural industries such as publishing, printing or newspapers. Another interesting example is Flatters (2005), which provides a detailed analysis of South Africa's Motor Industry Development Program (MIDP), which is widely regarded as a major success of South Africa's post-apartheid trade and industrial policies. He shows that the MIDP provides very large incentives to the automotive sector. From 1996 to 2003, automobile producers received and used Import Rebate Credit Certificates (IRCCs) worth over rand 55 billion. In 2002 and 2003 alone, their value exceeded rand 15 billion per year. In addition to the IRCCs, automobile producers benefited from duty drawbacks, duty-free allowances or productive asset allowances as well as from assistance provided by other government departments and agencies at the national, provincial and local levels. Finally, Mehra et al. (2004) give a brief and mostly qualitative description of some prominent schemes that provide subsidies to the Indian textile industry.

(i) Fisheries

The issue of fishery subsides is receiving growing attention. The WTO Ministerial Declaration agreed at Doha in 2001 commits WTO Members to negotiations to clarify and improve WTO disciplines on fisheries subsidies. In 2002 at the World Summit on Sustainable Developments, Heads of State called for the elimination of environmentally harmful fisheries subsidies.[250]

The reason is that marine resources have deteriorated severely over the last 30 years[251] and subsidies arising from government efforts to preserve employment in the shipbuilding and fishing industry, for example, have been blamed as one of the factors responsible for the overcapacity of fleets and the over-exploitation of fish stocks.[252]

250 Extensive literature exists on the impact of fishing subsidies (see for a review OECD, 2003b and 2005h, UNEP, 2001). This literature, in general, highlights that not all subsidies are environmentally harmful. For example, subsidies provided to fishermen for vessel decommissioning, aid to retraining and pre-retirement may be classified as environmental subsidies as they tend to reduce the incentive to fish and fleet capacity.

251 The proportion of global stocks classed by the FAO as over-exploited, depleted or recovering grew from 10 per cent of the total in the mid-1970s to an alarming 25 per cent by the early 1990s (The Economist, May 4th 2005 "The Tragedy of the Commons").

252 Fish stock is a common good and its exploitation suffers from what in economics is known as "the tragedy of the commons". That is, fishermen only consider the benefit they receive from one extra catch. They do not consider that there is a cost associated with catching one more fish – that is, the reduced stock of fish available to other fishermen. As a consequence, fishermen will fish more than socially optimal. In this context, a subsidy that increases the incentive to fish exacerbates the problem of over-fishing.

Central to the debate is the actual incidence of fishery subsidies. Despite many studies on the environmental impact of fishery subsidies, there are very few attempts to estimate the magnitude of support to the fishing industry worldwide. One exception is the study by Milazzo (1998) that estimated that global fishing subsidies in 1996 amounted to between US$14 billion and US$20 billion, representing around 20-25 per cent of world revenues in the sector.

International sources of systematically collected fishing subsides information are WTO notifications and the OECD data on government financial transfers (GFTs).[253] In addition, a study conducted by APEC (2000) provides fishing subsidy data for the years 1996 and 1997 for APEC countries. Table 28 provides data available from these different sources. Data are not directly comparable as different sources use different approaches to categorize and define subsidies. Nevertheless, the table is useful in providing a sense of the order of magnitude of subsidies and their evolution over time.

In general, Table 28 shows that OECD central governments dispensed around US$6 billion a year in transfers to their fishing industries, representing 20 per cent of the landed value of fish. Of this amount, about 40 per cent is provided by Japan, followed by the United States and the EU, representing about 15 per cent each. A substantial share of global fishery subsidies is accounted for by Canada, Republic of Korea and Russia, Indonesia and Chinese Taipei. Moreover, there appear not to be substantial variations in the level of subsidies over time.

Table 28
Fishery subsidies officially reported to international organizations (WTO, OECD and APEC)
(Million dollars)

Country	WTO notifications		OECD GFT		APEC
	1996-99	2000-03	1996-99	2000-03	1997
Canada	...	71	490	498	646
Mexico	...	...	16	...	7
United States	31	79	976	1156	158
Peru	...	...	...	...	1
EU[a]	676	530	1089	1033	...
Hungary	9	16	...	...	...
Iceland	...	...	37	30	...
Latvia	6	...	...	...	...
Norway	18	12	168	123	...
Slovenia	0	0			
Turkey	...	...	29	17	...
Russia	...	...	...	...	633
Australia	...	...	21	83	16
China					55
Hong Kong, China	...	...	...	...	13
Indonesia	...	...	...	...	254
Japan	35	62	2720	2526	2165
Korea, Rep. of	58	62	339	463	351
Malaysia	...	...	...	...	2
New Zealand	...	...	14	17	...
Philippines	...	...	...	...	2
Taipei, Chinese	5	13	...	...	188
Viet Nam	...	...	...	...	35

[a] GFT data for the EU are estimated as the sum of GFT for the 12 EU Members for which GFT data are available.
Source: OECD (2000d, 2001d, 2003d, 2005h), WTO notifications, APEC (2000).

[253] Annual statistics for OECD countries on GFT are published in the Review of Fisheries. This Review is published every two years, beginning in 2001.

A number of caveats need to be borne in mind when attempting to analyse available data sets on fishery subsides. First, infrastructure expenditure for the construction, improvement and maintenance of fishing ports are included in the list of subsidies programmes by APEC and the OECD, but, if they are "general infrastructure" they do not fall within the WTO definition of subsidies.[254] Since according to OECD data in 1999, for example, one-third of total government financial transfers were directed to the provision of fisheries-related infrastructure, this category may prove to be an essential element in explaining a large part of the gap between OECD and WTO subsidy notification figures.

Second, government payments to another government to acquire fishing rights for national fleets in foreign waters are included in the APEC and OECD datasets, but have not been reported to the WTO. This category appears particularly important for the EU, which currently has 22 bilateral fisheries agreements in force and whose annual expenditure for access to foreign waters exceeded US$250 million dollars on average between 1996 and 1997. Third, the part of government costs for managing fisheries resources that governments fail to recover from the fishery sector is counted as a subsidy in the APEC study and as government financial transfers (GFT) in the OECD series, while management expenditures have not typically been reported to the WTO. Fourth, the GFT definition of subsidies in the OECD also includes measures of market price support in the form of trade restrictions. These measures are excluded from the WTO definition of subsidies. To date, data on market price support equivalents have been provided to the OECD only by the United States.

Finally, as regards the coverage of subsidies in the data rather than the definition of subsidies, it needs to be borne in mind that, for example, the OECD data principally cover marine-capture fisheries. Data in GFT on subsidies to aquaculture and the processing and marketing sector are covered unevenly across countries (Cox, 2002). In contrast, subsidies to aquaculture and to the processing sector are largely covered in the APEC report. According to the APEC report, processing subsides are much smaller than subsidies to harvesting and farming. In addition, some categories of subsidies tend to be under-reported. For example, although most OECD countries provide fuel-tax concessions, the OECD dataset reports this information only for a few country cases. Also, OECD GFT data are collected at the national level and do not include transfers at the regional or local level.

A common feature of all official data available on fishery subsidies is that they provide a very limited coverage of fishery subsidies granted by countries other than the EU(15), United States, Canada, Norway, Iceland, Australia and New Zealand. Beyond the data provided for APEC countries and the Republic of Korea, Mexico and Turkey as OECD countries, WTO notifications provide data for Hungary, Latvia and Slovenia. But there appear not to be any official reports of fishery subsidies granted by other developing countries. A recent study (UNEP, 2004) reveals, however, that fishery subsidies do exist in developing countries and may also be important (see Box 17 for the case of fishery subsidies in Senegal).

Box 17: Fishery subsidies in Senegal

The fishing industry is Senegal's largest source of foreign exchange. Fishery exports in 2003 amounted to US$282 million, constituting 24 per cent of total merchandise exports in 2003, and 4.3 per cent of GDP. Fishing is the second most important source of employment, accounting for 15 per cent of the economically active population. Fish also provide the Senegalese population with 75 per cent of their animal proteins. Food security is, therefore, an important policy objective of the government in respect of its fishery sector.

Historically, government assistance to the fishery sector has seen two main phases. In the 1970s, support to the sector took the form of direct production subsidies to industrial fishing. Subsequently, the government turned to subsidizing small-scale fishing. At first, support to small-scale fishing was in the form of subsidies targeted to increasing output by means of encouraging the introduction of better equipment, modernization of vessels and improving infrastructure. Thereafter, state financial assistance to fishing was aimed at providing marketing support and encouraging exports. Free-trade zones and

254 The question of the scope of "general infrastructure" in this context has never been tested through WTO dispute settlement, and there are a range of views on this matter.

duty-free export company status, the Lomé Convention, export subsidies, fisheries agreements and devaluation all contributed significantly towards increasing exports.

According to recent estimates (UNEP, 2004), during the 1990s and until today the main modalities for granting fisheries subsidies in Senegal have been:

- Tax reductions on fishing equipment for the modernization of *pirogues*. The accumulated amount granted by the government is estimated at CFAF 2.01 billion (approximately US$2.7 million).
- A fuel subsidy for the enhancement of fishing equipment and to prolong sea trips and open up fishing areas. The fuel subsidy to small-scale fishing alone rose from less than CFAF 2 billion in 1986 to over CFAF 6 billion in 1998 (approximately US$10 million).
- Subsidies to small-scale fishing through the *Caisse Nationale de Crédit Agricole du Sénégal* (CNCAS), the fund's portfolio has remained below CFAF 3.2 billion in ten years of intervention in the sector.
- Subsides to industrial fishing through the *Fonds de Promotion Economique* (FPE). This includes: (i) an "economic advancement" fund, which is a credit line of CFAF 39 billion; (ii) a guarantee fund (to cover risks involved in lending to SMEs); and (iii) a "participatory loans" fund of CFAC 3 billion set up by the State to offset inadequate equity of entrepreneurs.
- Investments in infrastructures, including the construction of fishing wharves and the creation of the Central Fish Market (CFM). The latter was built in 1992 at a cost of CFAF 3 billion (90 per cent was financed by Japan). The CFM was enlarged in 1998 at a total cost of over CFAF 3 billion (99 per cent financed by Japan) .
- Export subsidies (until 1994). By way of example, export subsidies to the trawler fishing industry in the fiscal year 1991/1992 amounted to CFAF 12 billion (approximately US$18 million).
- In 1995, a subsidy of CFAF 1.7 billion was granted to some 30 Senegalese companies as a means of financing up to 30 per cent of their investments to adapt to European standards, in cooperation with *Coopération Française*.

Senegal has concluded many fishing agreements with foreign countries, by far the most important among them being those with Japan and the European Union. Those with Japan relate mainly to tuna, while those with the European Union concern coastal demersal and, more recently, pelagic fisheries. The European Community's total financial contribution to Senegal is of €16 million a year during 2002-2006.

Table 29
European Union (15) fishery subsidies, 2002-03
(Million dollars)

	2002	2003
OECD - GFT	949[a]	1170[b]
WTO notifications	710	
EU (15) - State Aid	320	440
CFP	1032	1026
of which FIFG	702	654

[a] Do not include Belgium and Austria; [b] Do not include Belgium, Austria and Denmark.
Source: OECD (2003d), WTO notifications, European Commission (2001), European Commission Budget Data, European Commission State Aid Scoreboard available at: http://europa.eu.int/eur-lex/budget/data/D2005_VOL4/EN/nmc-titleN15AFA/index.html
http://europa.eu.int/comm/competition/state_aid/scoreboard/indicators/k9.html#statsl.

An important source of fishery subsidy data for EU member countries is the EU state aid data. These data report annual notifications of subsidies by EU member countries to the Commission. Table 29 shows the data for fishery subsidies received by this sector in the EU as reported by the OECD, WTO notifications, EU state aid data and annual budget of the Commission. Again, large differences emerge. In this case, however, two points may explain a large part of these divergences. First, transfers from the EU are included in the GFT measure, while they are excluded from state aid. Second, overall outlays for the Common Fishery Policy (CFP) and the GFT measure include, for example, expenditure for agreements with third countries that are not included in the WTO notification.

Table 30 shows the relevance of EU fishery subsidies for the sector reported in EU state aid statistics and the OECD government financial transfer data in terms of subsidies as a share of total landed values. The differences between the two data sets are mainly driven by the flow of community subsidies to the sector. For example, Spain captures about 50 per cent of total Community structural funds.

A comparison of fishery subsidies across different sources of data at the country level is also possible for Australia. The Productivity Commission provides data[255] on Australian Government budgetary assistance. Table 31 shows data on fishery subsidies for Australia provided by the OECD and the budgetary assistance measure of the Productivity Commission. Both series show an upward trend for fishery subsidies in Australia, although figures from the Productivity Commission appear much lower. It is difficult to assess what generates this difference.

As far as the overall trend in fishery subsidies is concerned, the various sources of international fishery subsidy data all appear to suggest that fishery subsidies have remained substantially unchanged over time in absolute terms (see Table 28). However, what appears to have changed over time are the stated policy objectives. Fishery subsidies are intended to meet a number of objectives ranging from the provision of research and management services for sustainable fisheries to fleet modernization to regional development and income support. According to two studies by the OECD (2005d, 2005h), the recent trend, especially in developed countries, is to shift the emphasis toward environmental protection.

Table 30
European Union (15) subsidies to fishery as a share of total landed value
(Percentages)

	EU-State Aid 2002	OECD –GFT 2001
EU (15)	5	11
Austria	...	...
Belgium	7	7[c]
Denmark	1	2[c]
Finland	31[a]	26
France	5	5
Germany	10[b]	3
Greece	4	23
Ireland	4[c]	...
Italy	9	9
Netherlands	3	3
Portugal	3	0
Spain	6[b]	18[c]
Sweden	1	3
United Kingdom	5	0

[a] Landed value includes quota species only. [b] Data refer to 2001.
[c] Data refer to 2000. Shares of landings for the OECD are calculated on GFT direct payments and cost reducing transfers, general services transfers are excluded.
Source: OECD (2003) Review of Fisheries in OECD Countries, European Commission State Aid Scoreboard available at: http://europe.eu.int/comm/competition/state_aid/scoreboard/stat_tables.html#partone. European Commission (2004), Facts and Figures on CFP and WTO calculations.

Table 31
Fishery subsidies in Australia, 2000-03
(Million US dollars)

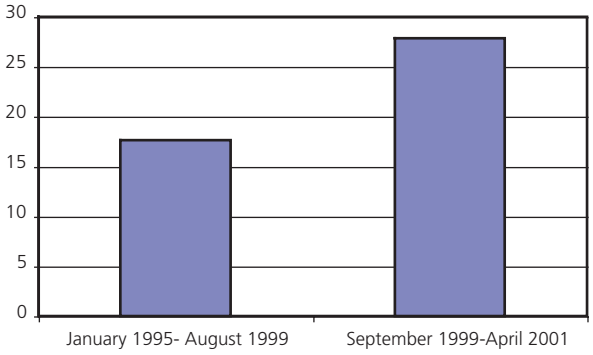
	2000	2001	2002	2003
OECD - GFT	82	76	78	96
	1999/2000	2000/01	2001/02	2002/03
Productivity Commission - Budgetary Assistance	34	34	41	50

Source: Australian Government Productivity Commission, Trade and Assistance Review, OECD (2003d, 2005i) Review of Fisheries in OECD Countries.

An increasing amount of support is provided with the stated objective of introducing more environmentally-acceptable fishing technologies, compensating fishermen for the closure of fishing grounds, the retraining of fishermen, the decommissioning of fishing vessels, retirement incentives for fishermen, renewal of the fishing stock for preservation and conservation of the catch and so on. The analysis of fishery subsidies notifications to the WTO under the SCM confirms this tendency. Between 1998 and 2001, a growing number of

[255] See Australian Government Productivity Commission, Trade & Assistance Review.

Chart 13
Fishery subsidies notifications with a stated environmental objective
(Percentage of total fishery subsidy notifiction)



Note: Data cover notified subsidies to the harvesting sector, the industry engaged in processing and/or sale of wild harvested fish and other subsides related to the fishing industry, such as R&D and marketing. Subsidies to the shipbuilding industry are excluded from the count.
Source: WTO (1998b, 1999, 2001).

environmentally-motivated subsidies have been notified to the WTO (see Chart 13).[256] The process appears to be driven by subsidy notifications of Sweden and Denmark for the EC and Japan. However, environmentally-motivated fishery subsidies have also been notified by Latvia, Slovenia and Tunisia. Some evidence of a move toward environmentally-motivated subsidies is also available from country-level data on fishery subsidy by objective for Cape Verde. For example, although total fishery subsidies in Cape Verde remained substantially unchanged between 1999 and 2000, there was a fall in subsidies for the purchase of ice and an increase in decommissioning grants.

(ii) Coal

To the best of our knowledge, there is no public database with statistics on coal subsidies that would allow a comparison of subsidy policies across the main producers in the world. The International Energy Agency (IEA) collects and publishes detailed information on coal production, consumption, trade, and prices for all its members but it does not collect information on subsidies.[257] Various sources are used in this Section to shed some light on coal subsidies. Available evidence fails to provide the full picture but points at a certain number of common trends as well as differences across countries and regions. While information on some of the largest coal producers in the world, including China, South Africa, Kazakhstan and Ukraine (see Table 32) is very limited, information on some of the others, such as Australia, Germany, Spain, Poland, Russia or the United States is fairly detailed. Our overview suggests that many coal-producing countries, developing or

Table 32
Producers, exporters and importers of coal, 2004
(Million tonnes)

Producers			Exporters		Importers	
	Hard coal	Brown Coal		Hard Coal		Hard Coal
China	1956[a]	...	Australia	218	Japan	183
United States	933	76	Indonesia	107	Korea, Rep. of	79
India	373	29	China	87	Taipei, Chinese	60
Australia	285	69	South Africa	66	Germany	39
South Africa	238	0	Russia	65	United Kingdom	36
Russia	210	70	Colombia	52	India	31
Indonesia	129	0	United States	43	Italy	25
Poland	100	61	Canada	27	United States	25
Kazakhstan	83	4	Kazakhstan	22	Spain	24
Ukraine	62	0	Poland	20	Netherlands	23
Rest of the world	260	570	Rest of the world	48	Rest of the world	229
World	4629	879	World	755	World	754

[a] Includes brown coal.
Source: Coal Information, IEA Statistics 2005, International Energy Agency.

256 Following the definition adopted by the Committee on Trade and Environment fishery subsidies notifications in Chart 13 count as environmental subsidies only if there is a reference to natural resource management, preservation and renovation, data collection, analysis and studies on these issues. If the objectives of the measure concern income support, restructuring of the sector, modernization of the vessels, etc., it is not considered to be environment-related (see WTO document WT/CTE/EDB/2). Note that under this definition no judgement is made on whether the subsidy has, in practice, a beneficial effect on the environment.

257 IEA member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, the Republic of Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States. The European Commission also takes part in the work of the IEA.

developed, grant or have granted subsidies to their coal industry. It suggests that in a number of cases the nature of the subsidies and their objectives have changed. It also shows that many countries have reduced their subsidies in the last decade.

Coal has played a crucial role in the process of industrial development of numerous countries. It can be used as a primary input to produce energy and it is a fuel for industries, including metallurgy, as well as households. In some regions, such as emerging Asia, coal continues to dominate electricity and industrial sector fuel markets. In some cases, governments subsidized the coal sector to promote industrial development and energy security.

In some regions, however, the strategic importance of coal decreased with the diversification of energy sources and the competitiveness of the domestic coal industry eroded progressively. Because of the historical and social importance of coal-mining activities to local economic activity and employment, governments intervened, sometimes heavily, to support the coal industry. Government intervention, however, often prevented necessary adjustments from taking place. Subsidies that were supposed to be part of the solution became part of the problem (Steenblik and Wigley, 1990). In a number of countries, the heavy cost of subsidies led governments to force the coal industry to embark on substantial restructuring measures, sometimes involving major cutbacks in activity. Restructuring of the coal sector, a World Bank focus since the early 1990s, has been undertaken in India, Mongolia, Romania, Russia and Ukraine. It has also been undertaken in Japan, Republic of Korea, Turkey and several EU Member countries. In most cases, restructuring has contributed to decreases in production. Coal production has declined significantly in both Western and Eastern Europe, in Japan and in the Republic of Korea.[258] It has also declined substantially in the CIS countries, even if there has been a rebound in the last few years. However, in other countries such as India, restructuring has accompanied an increase in production.

While one of the objectives of restructuring is usually to reduce subsidies, it typically involves granting some other forms of aid. In the case of the EU for instance, Council Regulation 1407/2002 on state aid to the coal industry recognizes the need for more efficiency in this sector and for cutting back subsidies while at the same time justifying the maintenance of coal-producing capability supported by state aid as part of an effort to strengthen the Union's energy security.[259] It states that production units that are not eligible for energy security-related aid must be able to benefit temporarily from aid to alleviate the social and regional consequences of their closure. It allows for aid to cover exceptional costs, inherited liabilities in particular, which in accordance with normal accounting practice do not affect the cost of production. Finally, the Council Regulation also allows Member States to grant aid for research and development and aid for environmental protection and training to the coal industry. Similarly, the objective of World Bank supported restructuring programmes is typically to help the coal industry become competitive financially and socially, as well as environmentally responsible.

PSE estimates from IEA for the year 2000 quoted in UNEP (2004) suggest that around 7 per cent of the 1.3 billion tonnes of hard coal produced by IEA member countries in 2000 received production subsidies.[260] State aid was granted by France, Germany, Japan, Spain, Turkey and the United Kingdom. The same source also notes that the amount of IEA hard-coal production receiving government financial assistance, as measured by the PSE, declined over the 1990s, both in absolute and in percentage terms. Between 1991 and 2001, subsidized production fell by 55 per cent. In 2000, total PSE assistance by all IEA members was estimated by IEA at US$5.8 billion, of which 68 per cent was accounted for by Germany. In all countries except Japan, subsidies were almost entirely in the form of direct aid.

[258] See IEA (2004) Coal Information, IEA Statistics, Paris: OECD/IEA.

[259] The European Coal and Steel Community Treaty expired on 23 July 2002 upon which this new Council Regulation was established as the new legal framework for state aid to the Community coal industry.

[260] Note that OECD (IEA plus Iceland, Mexico, Poland and the Slovak Republic) hard coal production was only about 35 per cent of total production in 2003 and only two (United States, Australia) of the ten largest hard coal producers in the world are IEA Members.

The above-mentioned IEA figures, which only cover certain IEA members and only assistance to current production, should be interpreted carefully. Evidence for the European Union (Table 33) shows that while operating aid was cut by about half over the period 1994 to 2000, other types of aid increased substantially. Aid for the reduction of activity was multiplied by a factor of three while other aid increased slightly. State aid figures for the period 2001-03 suggest that these trends have continued.[261] In 2003, around €5.4 billion was granted to the EU (15) coal sector, with some 60 per cent of this figure related to current production. Because Germany accounts for close to 70 per cent of total EU state aid to the coal sector, these trends are largely driven by changes in German coal policy. Over the whole period, France did not pay any operating aid while Spain slightly increased its operating aid and slightly decreased its aid for the reduction of activity.

Table 33
European Union (15): Total aid to the coal sector authorized, 1994-2000
(Million euros, euros/tonne)

	1994	1995	1996	1997	1998	1999	2000
				Million euros			
Total	7790	8235	7690	7855	8262	6756	6968
Operating aid	5115	5081	5673	3566	3023	2994	2439
Aid for the reduction of activity	800	558	550	2428	2394	2400	2400
Other	1875	2596	1466	1862	2846	1363	2130
				Euros/tonne			
Operating aid	68.3	42.6	51.3	35.7	34.6	35.0	34.4
Aid for the reduction of activity	71.9	53.4	51.3	135.8	152.1	155.7	159.9

Source: European Commission (2001), Commission Report on the Application of the Community Rules for State Aid to the Coal Industry in 2000, COM (2001) 327 final.

While the social and regional function of these aid programmes has been recognized, their cost-effectiveness ratio has been questioned (Steenblik and Wigley, 1990; Steenblik and Coroyannakis, 1995).[262] According to the European Commission, the annual sums paid in aid to current production in 2000 amounted to approximately €60,000 per worker in Germany, slightly less than €50,000 in France and slightly more than €40,000 in Spain. These figures, which do not include aid to cover exceptional costs or inherited liabilities nor specific social benefits paid by Member States, are appreciably higher than the average wages of the workers concerned. Moreover, given the very long period over which some Member States have been paying aid to the coal industry and the typically short duration of miners' professional careers, a great majority of the mine workers currently employed can be considered to have spent their entire careers working for firms that have been continuously state-supported. The growing awareness of those problems, in a context of pressure to cut public expenditure, has led governments to limit both the quantity and duration of state aid. The German restructuring plan for the period 2003-05 foresees a reduction in total aid from €3.3 billion to €2.7 billion, while French aid measures to cover the costs of closure of the last underground mines in France (which closed in April 2004) have just been approved.

Coal mining in the new EU Member States tends to be more competitive than in the EU (15) Member States.[263] Poland has by far the largest coal industry and produces far more than the rest of the EU put together. The Commission approved a long-term restructuring plan amounting to €1.5 billion for the period 2004-06. For Hungary, the Commission approved a long-term restructuring plan, which contains the granting of production aid up to 2010 to the value of €255 million. For the Czech Republic, the Commission approved aid measures not related to production but to inherited liabilities of the past up to 2007, amounting to €74 million.

The Korean (Republic of) government, for instance, is also rationalizing its coal mining industry, but its strategy seems to be slightly different. While most coal used in the Republic of Korea is imported, it is also the only

261 See European Commission (2005a) State Aid Scoreboard.

262 See IEA (2004) Coal Information, IEA Statistics, Paris: OECD/IEA.

263 See European Commission (2005a) State Aid Scoreboard, Autumn 2005 update.

fossil fuel found in significant quantities in the country. Between 1990 and 2003, domestic production decreased from 10.8 Mtce (million tonnes of coal equivalent) to 2 Mtce, while imports increased from 22.5 Mtce to 63.3 Mtce. Some 380 small mines closed between 1989 and 1995, which caused the loss of over 33,000 jobs. Domestic production is supported by a variety of government-funded measures, including direct subsidies for production, a tariff of one per cent on imported coal, a 10 per cent VAT on imported coal, and low-interest loans to coal producers. Financial assistance is also provided when uneconomic mines are closed and subsidies are paid to produce coal briquettes that are traditionally used for home heating and cooking. Between 1990 and 1999, production subsidies rose from a total of US$115 million to US$381.6 million, while assistance for mine closures fell from US$28 million to US$1.1 million.[264] In the early part of 2000, according to the IEA, the level of the Republic of Korea's production subsidies to coal was about that of France and slightly lower than in Japan, but those two countries had firm plans to reduce production, while production in the Republic of Korea was expected to stabilize at about 2 Mtce per year.

Available information suggests that among the main producers, exporters and importers, some subsidize their coal industry, while some others do not. China, the largest hard-coal producing country and the third leading exporter, seems to have reduced or even phased out its coal subsidies. Hard coal production in China has experienced a remarkable recovery since the late 1990s when the government instituted a series of company consolidations and mine closures. The state mandated 25,000 coal mines to close and also partially lifted price controls. There are indications that the government cut coal subsidies substantially after 1990.[265] The United States is the second largest producer in the world but only the seventh ranking exporter. Less than 5 per cent of its total production is exported, as most of US coal is used domestically for electricity generation. In 2000, coal accounted for 52 per cent of total electricity generation. Coal production is not subsidized. However, the National Energy Policy recommends investment of US$2 billion over ten years to fund research in clean-coal technologies and a permanent extension of the existing research and development tax credit for such technologies.[266] Fossil energy funding has roughly doubled between 1999-2000 and 2000-01 because of renewed emphasis on developing clean-coal technologies. Based on available information, it does not seem that India, the third largest producer of coal is subsidizing coal mining. Coal does not figure among the major subsidies in India's expenditure budget. Australia, the fourth largest producer and the main exporter of coal does not appear to subsidize coal production. Assistance to mining and petroleum, coal, chemical and associated products accounts for about 6 per cent of total assistance and the share of coal in this amount may be very small or even zero.[267]

Based on information at our disposal, it is not clear whether South Africa, Indonesia, Kazakhstan and Ukraine provide aid to their coal industries. However, available information suggests that both Russia and Poland provide subsidies to the sector. In 1993, subsidies to the Russian coal industry were about 1.05 per cent of GDP. This dropped to 0.47 per cent in 1996, 0.2 per cent in 1998 and 0.12 per cent in 2000. In line with the Ministry's restructuring initiative, as well as the World Bank loan conditions, subsidies to the coal sector were systematically reduced after 1995 and were increasingly aimed at social welfare, rather than at loss-making mines. In the early 2000, the sector was still dependent on subsidies and was expected to remain dependent in the foreseeable future. As mentioned above, the Commission just approved a long term restructuring plan for Poland amounting to €1.5 billion for the period 2004-2006.

264 See IEA (2002) Energy policies of IEA countries – Republic of Korea Review. According to UNEP (2003), subsidies had more or less stabilised at around US$500 million per year in 2002 and the Government was planning to phase out subsidies gradually.

265 Source: Global Energy Network Institute: http://www.geni.org/globalenergy/policy/renewableenergy/subsidies/subsidy_reform/coal/china/index.shtml, see also http://www.nrdc.org/media/pressReleases/010615.asp.

266 See IEA (2002) Energy Policies of IEA Countries, The United States 2002 Review.

267 See Productivity Commission (2004).

Appendix Table 5
WTO SCM Notifications: Sum of horizontal subsidies and subsidies to industry, 1995-2002
(Percentages of GDP)

WTO Member	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	0.034	0.042	0.071	0.055	0.023	0.016	0.014	0.019
Australia	0.029	0.049	0.029	0.024	0.025	0.051	0.062	0.123
Austria	0.015	...	0.162	0.113	0.097	0.201	0.089	0.088
Barbados	...	...	...	0.108	0.586	0.770	0.011	...
Belgium	0.275	0.391	0.292	0.258	0.319	0.252	0.362	0.178
Brazil	0.574	0.505	0.499	0.508	0.389	0.280	0.069	0.084
Bulgaria	...	0.633	1.339	1.848	0.929	0.691	0.428	0.406
Canada	0.116	0.091	0.082	0.094	0.092	0.088	0.096	0.088
Chile	0.454	0.213	0.398	0.408	0.436	0.407	...	0.434
Colombia	0.249	0.021	...	0.078	0.107	0.125	0.133	0.108
Croatia	...	...	...	...	...	0.108	0.161	0.230
Cyprus	0.079	0.368	0.339	0.200	...	...	...	...
Czech Republic	1.041	0.523	...	...	...	...	0.332	0.192
Denmark	0.144	0.438	0.604	0.636	0.829	0.543	0.636	0.543
Estonia	...	...	...	...	...	0.062	...	...
European Community	0.517	0.525	0.531	0.546	0.551	0.622	0.583	0.514
Finland	0.432	0.402	0.343	0.315	0.279	0.277	0.273	0.278
France	0.165	0.214	0.209	0.196	0.140	0.120	0.150	0.130
Germany	0.245	0.273	0.222	0.265	0.157	0.121	0.102	0.092
Greece	0.612	0.475	...	0.039	0.132	0.030	0.435	0.310
Hungary	...	2.082	1.906	1.309	1.503	1.629	1.399	1.823
Iceland	0.127	0.112	0.117	0.118	0.120	0.101	0.088	...
Ireland	0.009	0.092	0.006	0.009	0.000	0.007	0.006	0.005
Israel	0.890	0.280	0.703	0.668	0.625	0.555	0.649	1.018
Italy	0.094	0.114	0.251	0.295	0.130	0.146	0.208	0.139
Jamaica	...	...	...	1.417	3.900	4.022	...	...
Japan	0.043	0.068	0.070	0.073	0.039	0.017	0.017	0.013
Jordan	...	...	...	...	...	...	0.010	0.083
Korea, Republic of	0.218	0.196	0.119	0.128	0.104	0.081	0.080	0.065
Latvia	...	...	0.772	0.685	0.355	0.265	0.281	0.222
Luxembourg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Netherlands	0.055	0.036	0.189	0.098	0.116	0.135	0.136	0.142
New Zealand	...	...	...	...	...	...	0.027	...
Norway	0.520	0.490	0.439	0.337	0.457	0.392	...	0.297
Pakistan	0.002	0.000	0.002	...	...	...	...	...
Panama	...	...	...	...	0.390	0.429	0.340	0.274
Poland	9.470	1.218	2.351	3.079	0.849	...	...	...
Portugal	...	0.000	0.025	0.139	0.108	0.070	0.000	0.000
Romania	1.854	1.660	...	...	...	...	...	...
Saint Kitts and Nevis	...	...	...	...	...	...	0.273	...
Saint Lucia	...	...	...	...	0.854	1.061	1.717	2.160
Saint Vincent and the Grenadines	0.349	0.372	0.393	...	...	...	7.653	4.687
Slovak Republic	...	...	0.503	...	...	...	...	...
Slovenia	1.187	0.952	0.739	1.376	1.129	0.630	0.579	0.599
South Africa	0.027	...	...	...	...	...	...	...
Spain	...	...	0.196	0.101	0.145	0.107	0.120	0.093
Sweden	0.193	0.254	0.308	0.297	0.205	0.172	0.152	0.148
Switzerland	0.015	0.013	0.026	0.020	0.022	0.067	0.075	0.069
Thailand	1.109	1.059	1.117	0.707	0.153	0.181	0.000	0.000
Taipei, Chinese	...	0.002	0.001	0.272	0.502	1.878	0.659	0.530
Tunisia	2.070	2.002	...	2.076	2.556	2.069	...	...
United Kingdom	0.000	0.130	0.099	0.148	0.198	0.175	0.100	0.106
United States	0.076	0.074	0.063	0.010	0.059	0.058	0.054	0.080
Uruguay	...	...	...	0.172	0.284	0.102	0.378	0.420

Source: WTO Secretariat.

Appendix Table 6
Brazil: Subsidies by sector, 1999-2003
(Percentages)

	1999	2000	2001	2002	2003
Total	100.0	100.0	100.0	100.0	100.0
Agriculture	24.0	29.1	23.1	5.7	23.5
Industry	16.2	18.6	20.4	21.2	22.6
Mining	0.0	0.0	0.0	0.0	0.0
Manufactures	16.2	18.6	20.4	21.2	22.6
Vehicles (other than automobiles)	10.2	11.8	13.0	12.4	14.1
Services	59.7	52.3	56.5	73.0	53.9

Source: Instituto Brasileiro de Geografia et Estadistica (IBGE), Sistema de Contas Nacionals Brasil 2003, CONAC/DPE.

Appendix Table 7
Colombia: Subsidies by sector, 1998-2002
(Percentages)

	1998	1999	2000	2001	2002
Total	100.0	100.0	100.0	100.0	100.0
Agriculture	0.9	5.1	0.0	0.0	0.2
Industry	4.6	2.1	8.2	1.5	3.5
Mining	4.6	2.1	8.2	1.5	3.5
Manufactures	0.0	0.0	0.0	0.0	0.0
Electricity, water, construction	19.3	17.1	18.7	46.0	17.0
Services	75.1	75.7	73.1	52.5	79.4

Source: Colombia, Departamento Administrativo Nacional de Estadística.
http://www.dane.gov.co

Appendix Table 8
WTO SCM Notifications: Horizontal subsidies and subsidies to industry, 1995-2002
(Million dollars)

WTO Member	Sector	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	Horizontal	72.22	98.08	53.20	...	...	...	...	...
	Industry	15.00	15.01	153.98	164.78	65.13	45.32	37.32	19.59
Australia	Horizontal	...	109.56	50.86	37.60	46.61	51.52	65.74	70.38
	Industry	108.69	91.49	70.73	49.79	53.28	146.10	161.33	435.86
Austria	Horizontal	35.20	...	293.82	242.29	206.22	389.77	171.43	183.06
	Industry	...	...	44.03	...	...	...	...	...
Barbados	Horizontal	...	...	...	2.58	14.55	19.95	0.27	...
Belgium	Horizontal	761.07	1053.64	713.26	641.35	786.87	573.34	822.81	435.62
	Industry	...	...	1.62	4.17	15.02	1.69	1.41	0.61
Brazil	Horizontal	4041.59	3913.32	4030.62	4004.76	2090.10	1682.78	352.00	385.70
Bulgaria	Horizontal	...	33.83	137.18	231.65	112.63	71.88	46.11	56.98
	Industry	...	28.85	1.63	3.69	7.68	15.13	12.07	6.16
Canada	Industry	673.76	548.90	516.89	571.40	596.26	629.37	675.79	640.28
Chile	Horizontal	327.35	161.72	329.38	324.00	318.28	304.79	...	288.32
	Industry	...	...	...	...	...	...	...	...
Colombia	Horizontal	230.60	20.57	...	76.95	92.01	104.79	109.00	88.40
Croatia	Horizontal	...	...	...	...	...	...	7.08	7.73
	Industry	...	...	...	...	...	19.95	25.00	44.72
Cyprus	Horizontal	5.08	9.92	6.16	5.59	...	...	...	...
	Industry	2.15	23.98	23.65	13.19	...	...	...	...
Czech Republic	Horizontal	394.53	105.88	...	...	...	...	122.15	137.94
	Industry	180.63	213.78	...	...	...	...	79.68	3.47
Denmark	Horizontal	132.46	502.86	732.44	490.22	811.85	461.08	427.13	355.97
	Industry	126.56	298.95	288.64	606.28	623.03	398.01	584.29	573.05
Estonia	Horizontal	...	...	...	...	...	3.41	...	...
	Industry	...	...	...	...	...	0.00	...	...
European Community	Horizontal	33367.34	35946.62	34582.55	36968.95	39392.53	43318.47	40321.79	38603.30
	Industry	11346.73	10335.26	9498.04	9969.18	7934.14	6022.94	6208.00	6031.61
Finland	Horizontal	560.21	513.76	420.67	407.11	356.15	331.84	331.38	366.43
France	Horizontal	2503.30	3268.06	2916.52	2813.89	1983.62	1411.62	1681.59	1484.87
	Industry	80.14	99.50	63.05	75.09	56.06	187.34	331.28	404.67
Germany	Horizontal	5629.78	6167.31	4649.21	5547.81	3208.65	2041.64	1654.65	1455.99
	Industry	544.14	481.66	144.81	238.22	154.23	254.95	278.26	413.01
Greece	Horizontal	23.12	21.21	...	1.35	2.64	0.98	10.88	17.88
	Industry	696.15	569.94	...	45.74	163.57	33.18	500.82	395.35
Hungary	Horizontal	...	747.72	720.25	525.32	568.32	616.40	575.00	756.95
	Industry	...	192.69	151.04	90.79	153.60	144.00	150.30	426.64
Iceland	Horizontal	8.67	7.98	8.44	9.41	10.07	8.46	6.67	...
Ireland	Horizontal	...	...	0.56	0.52	...	...	...	...
	Industry	6.11	67.37	3.94	7.20	0.02	6.70	6.36	6.28
Israel	Horizontal	338.40	266.33	279.76	284.72	279.13	17.67	421.80	426.29
	Industry	503.14	25.51	482.45	439.02	400.32	653.91	348.83	682.20
Italy	Horizontal	699.20	767.53	2491.66	3232.90	1298.81	1294.50	2025.01	1395.97
	Industry	328.71	640.95	436.85	291.55	231.04	274.63	241.31	250.31
Jamaica	Horizontal	...	...	...	109.70	301.50	317.70	...	...
	Industry	...	...	...	...	...	...	...	...
Japan	Industry	2282.86	3209.46	3029.99	2862.48	1733.14	809.94	725.99	503.78
Jordan	Horizontal	...	...	...	...	...	...	8.90	7.83
Korea, Rep. of	Horizontal	37.78	52.71	39.42	31.23	26.22	23.96	54.61	71.96
	Industry	1087.44	1040.05	576.46	412.16	437.82	390.01	329.79	281.70
Latvia	Horizontal	...	...	47.36	45.35	13.63	20.50	23.15	20.43
	Industry	...	...	...	...	12.01	...	...	...
Luxembourg	Horizontal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
New Zealand	Horizontal	...	...	...	...	...	...	13.87	0.00
Norway	Horizontal	413.57	450.47	363.16	326.36	299.79	284.43	0.00	302.20
	Industry	356.23	330.21	327.27	179.33	423.49	369.09	0.00	262.45

Appendix Table 8
WTO SCM Notifications: Horizontal subsidies and subsidies to industry, 1995-2002 (cont'd)
(Million dollars)

WTO member	Sector	1995	1996	1997	1998	1999	2000	2001	2002
Pakistan	Industry	1.32	0.04	1.38	...	...	...	...	...
Panama	Horizontal	...	...	...	...	...	...	...	...
	Industry	...	...	...	...	44.70	49.90	40.10	33.60
Poland	Horizontal	256.12	1080.33	2325.94	551.22	124.05	...	...	...
	Industry	12614.25	792.28	1288.19	4670.18	1272.53	...	...	...
Portugal	Horizontal	...	0.29	0.23	12.89	0.68	0.00	0.10	0.51
	Industry	...	0.09	26.13	142.88	123.68	74.48	0.16	...
Romania	Horizontal	254.17	211.37	...	...	...	...	...	...
	Industry	403.73	374.97	...	...	...	...	...	...
Saint Kitts and Nevis	Industry	...	...	...	...	...	...	0.94	...
Saint Lucia	Horizontal	...	...	...	...	...	...	...	...
	Industry	...	...	...	...	5.71	7.25	11.23	14.62
St. Vincent and the Grenadines	Industry	0.92	1.04	1.16	...	...	...	26.48	16.92
Slovak Republic	Horizontal	...	...	96.87	...	...	...	...	...
	Industry	...	...	9.80	...	...	...	...	...
Slovenia	Horizontal	133.25	87.98	96.83	169.55	176.69	108.34	104.81	128.16
	Industry	104.33	103.83	47.11	117.42	64.07	12.02	8.86	4.33
South Africa	Horizontal	...	...	...	...	...	...	...	...
	Industry	41.36	...	...	...	...	...	...	...
Spain	Horizontal	...	...	172.70	162.18	471.00	289.15	328.31	320.43
	Industry	...	...	962.01	451.07	427.94	330.14	399.03	319.49
Sweden	Horizontal	459.54	659.56	678.60	697.68	467.65	409.24	325.29	344.04
	Industry	18.89	28.33	83.95	39.55	48.60	1.63	7.70	14.35
Switzerland	Industry	46.51	38.67	68.70	54.77	57.25	165.20	188.65	190.55
Taipei, Chinese	Horizontal	...	...	...	...	...	2850.69	22.04	429.62
	Industry	...	4.43	3.77	750.80	1478.29	2622.12	1757.47	1054.83
Thailand	Horizontal	1862.66	1927.69	1685.41	790.63	187.84	222.60	0.51	0.52
	Industry	...	...	...	...	...	...	...	...
The Netherlands	Horizontal	224.20	80.02	536.30	224.07	292.00	311.25	361.18	456.80
	industry	3.11	66.89	176.30	162.67	171.46	188.51	161.51	136.55
Tunisia	Horizontal	373.00	391.23	...	410.58	530.29	401.26	...	...
	Industry	0.25	0.81	...	0.71	1.27	1.07	...	...
United Kingdom	Horizontal	...	1478.55	1244.27	2040.48	2854.54	2464.64	1246.01	1547.04
	Industry	3.62	65.70	63.50	57.21	45.03	50.44	185.11	110.59
United States	Horizontal	4210.00	4596.50	3673.95	801.35	4534.40	4372.70	4054.60	7240.20
	Industry	1382.25	1169.32	1490.96	85.61	945.99	1326.85	1371.14	1078.73
Uruguay	Industry	...	...	...	38.47	59.34	20.58	70.14	51.54

Source: WTO Secretariat.

Appendix Table 9
European Union (15): Horizontal and sectoral state aid, 2000-03
(Million euros, percentages)

	EU (15)		New Members	
	Value	Share	Value	Share
Horizontal objectives	29841	73	1462	24
R&D	5286	15	116	2
Environment	6868	16	149	2
SME	5388	14	147	2
Commerce	377	1	14	0
Employment aid	1211	2	348	6
Training aid	918	2	79	1
Heritage conservation, cultural aid	631	1	44	1
Natural disasters	54	0	4	0
Risk capital	24	0	1	0
Regional aid	9085	23	560	9
Sectoral aid	9977	25	4608	75
Manufacturing	1753	4	1441	24
Shipbuilding	903	2	105	2
Steel	13	0	246	4
Motor vehicles	17	0	73	1
Coal	6657	17	1413	23
Other non-manufacturing	240	1	51	1
Financial services	1162	3	1685	28
Other services	165	0	15	0
Total aid less agriculture, fisheries and transport	39839	100	6067	100

Source: European Commission (2004), State Aid Scoreboard, Autumn 2004 update.

Appendix Table 10
European Union (25): Share of state aid by sector, 2004
(Percentages, million euros)

	Share					Value
	Manufacturing	Fisheries	Coal	Other[a]	Total	Total
EU (25)	59	1	9	31	100	61617
Belgium	65	0	0	35	100	972
Czech Republic	37	6	4	53	100	352
Denmark	71	1	0	28	100	1375
Germany	66	0	18	16	100	17236
Estonia	24	0	0	76	100	35
Greece	66	2	0	32	100	473
Spain	49	3	28	20	100	3975
France	54	1	10	35	100	8915
Ireland	33	0	0	67	100	951
Italy	72	2	0	26	100	7037
Cyprus	35	0	0	65	100	184
Latvia	25	0	0	75	100	44
Lithuania	16	1	0	83	100	122
Luxembourg	48	0	0	52	100	78
Hungary	63	0	5	32	100	1015
Malta	87	0	0	13	100	134
Netherlands	47	0	0	53	100	1813
Austria	32	0	0	68	100	1427
Poland	51	0	17	32	100	2873
Portugal	13	1	0	86	100	1475
Slovenia	46	0	6	48	100	250
Slovakia	98	0	0	2	100	212
Finland	22	0	0	78	100	2483
Sweden	75	0	0	25	100	2745
United Kingdom	71	2	1	26	100	5442

[a] "Other" includes services (excluding railways), agriculture and other non manufacturing.
Source: European Commission (2005), State Aid Scoreboard, Autumn 2005 update.

4. SERVICES

Providing an overview of the worldwide distribution and evolution of services subsidies is a challenging task. Data on subsidies in services are scarce and most of the time only available from national sources, which renders cross-country comparisons difficult. In addition, the extent of disaggregation of services subsidies data from national sources is very limited. Therefore, it is difficult to assess the distribution of services subsidies across various types of subsidies and their evolution over time.

Detailed information is provided by the Australian Productivity Commission's Trade and Assistance Reviews. These data show that the amount of total subsidies the Australian Government provide to the services sector has significantly increased in the last decade, surging from US$395 million in FY 1995-96 to US$659 million in FY 2004-05. Yet, the share of total Australian government subsidies to services sectors fell from 27 per cent to 19 per cent in the same period, thus implying that subsidies to the services sector have increased less than total subsidies. At the sub-sectoral level, the largest share of total services subsidies is provided to cultural and recreational services, business, communication, finance and transport services, totalling together over 65 per cent of total services subsides in FY 2004-05. Finally, although budgetary outlays are a more common form of subsidies to the services sector in Australia, there are substantial differences across sectors as to the type of subsidies they receive. Over 90 per cent of subsidies to financial services are provided by way of tax exemption, while budgetary outlays represent a similar share of total subsidies granted to communication services.

Data available for other countries are very far from providing this kind of detailed information. Notwithstanding this limitation, an attempt will be made in this Section to discuss the incidence of services subsidies by country and sub-sector. Within each sub-sector, the major motivations for providing subsidies and the use of different types of instruments will also be discussed.

(a) Services subsidies by region

A useful, though not comprehensive, source of information on subsidies is the series of background notes done by the WTO Secretariat for the Working Party on GATS Rules (S/WPGR/W/25 and addenda). These Notes, which compile information contained in Trade Policy Reviews (TPR) on subsidies in services (from 1995

Table 34
Subsidy information contained in TPRs of Members by region and sector, 1995-2004
(Number of countries)

	North America	Western Europe	Central and Eastern Europe	Africa	Middle East	Asia	Latin America	Total number of Members targeting sector
Number of Members reviewed	3	6	6	24	1	17	24	81
Tourism	1	4	4	22	1	10	20	62
Transportation	1	2	4	7	...	7	2	23
Maritime	2	2	1	2	...	11	7	25
Air transport	3	1	1	2	...	5	2	14
Rail transport	...	3	2	4	...	4	..	13
Banking	2	4	3	7	...	10	7	33
Other financial services	1	...	...	3	...	6	7	17
IT and communication	1	1	1	3	...	5	4	15
Construction	1	1	1	2	...	5	5	15
Recreation, culture and sports	1	1	...	2	1	3	4	12
Telecom	2	...	...	6	...	3	7	18
Audiovisual	2	1	...	3	...	3	2	11
Wholesale and retail trade, distribution	...	1	1	2	...	3	4	11
Real estate	1	...	...	...	...	3	1	5
Energy	1	1	2	2	...	4	4	14
Other and unspecific sectors	1	1	3	7	...	7	9	28

Note: EU (15) is treated as one country.
Source: WTO Secretariat, in the light of information collected from TPRs in S/WPGR/W/25/Add.1-4.

to February 2004), suggest that subsidies in services sectors are widespread, but particularly frequent in transport, tourism and banking.[268]

Table 34 presents the information compiled in the background notes by services sector and by region. Subsidy programmes for transportation, including maritime, air and rail transport, are those most frequently granted by WTO Members reviewed in the period covered. Although it should be kept in mind that the frequency of the programmes as reported in TPRs does not say anything about the size of these subsidies, it is worth noting that information on subsidies in the tourism sector was mentioned in the TPR of the majority of Members.

The discussion in the following Sections shows that the reasons given for applying subsidies in different sectors vary substantially. In developing countries tourism subsidies are often justified as being part of a development strategy. Subsidies in the financial sector are sometimes given to ailing banks in order to avoid bankruptcies that may have severe economy-wide repercussions. Subsidies to the transport and telecommunication sector sometimes appear to be motivated by such objectives as the provision of universal access or the development of infrastructure.

Table 35 shows the choice of subsidy instruments deployed by region. Nearly all Latin American WTO Members reviewed over the relevant period used tax incentives, duty free inputs and free zones to support certain activities. Direct grants, preferential credit and credit guarantee arrangements, and above all equity injections, are less popular instruments in the region. A similar picture arises for Africa, although tax incentives, duty free inputs and free zones are used to a lesser extent. The use of direct grants and preferential credit and guarantee arrangements is more popular in industrialized countries, although all three North American countries also use tax incentives.

Table 35
Subsidy information contained in TPRs of Members by region and instrument, 1995-2004
(Number of countries)

Regions	North America	Western Europe	Central and Eastern Europe	Africa	Middle East	Asia	Latin America	Total
Number of members reviewed	3	6	6	24	1	17	24	81
Direct grants	2	5	3	7	1	6	8	32
Preferential credit and guarantees	2	2	3	6	0	6	6	25
Equity injections	2	2	2	2	0	4	0	12
Tax incentives	3	2	2	14	1	13	22	57
Duty-free inputs and free zones	0	1	2	13	1	9	20	46
Other and unspecified measures	1	1	4	8	0	9	3	26

Source: WTO Secretariat, in the light of information collected from TPRs in S/WPGR/W/25/Add.1-4.

(b) Services subsidies by sub-sector

This subsection will refer to the use of subsidies in a number of services sectors, such as transport and telecommunication, banking, tourism and audiovisual services. These are the sectors that TPR reports tend to indicate as the largest beneficiaries of subsidies. The nature of these sectors differs substantially, as do the reasons for applying subsidies and the instruments used.

(i) Transport services

There are a variety of policy goals that government claim to pursue through subsidies to the transport sector. The case for public support to transport services is, in general, put forward on the grounds of market failures due to the existence of large economies of scale, the network nature of the services, and the desirability

[268] For a discussion of the limitations which need to be kept in mind when drawing inferences from the information contained in TPR reports, see Box 12 and WTO Secretariat documents S/WPGR/W/25 and addenda.

of providing universal access.[269] Transport services are often regarded as "merit" goods, which should be available to everyone. Not only are they essential inputs in virtually all other economic activities, but they are necessary to satisfy the needs of everyday life. For this reason, granting universal access to the transport network at an accessible price is a government policy objective almost everywhere. Subsidies are provided to guarantee the supply of services at locations and times when it would not otherwise be profitable. For example, prior to September 2001, support to the US air transport industry had been confined largely to the provision of federal subsidies for service to remote areas.[270] Similarly, Australia provides financial assistance to shippers of freight between Tasmania and the mainland.

A number of other policy goals are also declared by governments as justification for the subsidies provided. For example, one reason behind the subsidization of some specific modes of transport, such as rail transport, is that of pursuing an environmental target – rail transport is generally deemed to be less polluting than road transport. Other stated policy objectives include technology transfer and economic development. Venezuela, for example, provides income tax reductions to persons earning revenue from the supply of public air transport services. The law is designed to foster new investment in modernizing fleets compatible with environmental protection requirements, incorporating new technologies in relation to the supply of the service and training technical aviation personnel.[271]

No commonly accepted measure of subsidies exists in the transport sector. Many transport economists favour a normative definition of transport subsidies that also includes all those "implicit" subsidies that arise from the failure to include in the price paid by the user of a transport service the cost represented by negative externalities. For example, an implicit subsidy arises from the cost of the environmental damage for which a person driving a car is responsible but not required to pay (air pollution, noise nuisance, the probability of an accident and congestion). In this case subsidies are estimated as the difference between total revenues and total social costs. On the basis of this measure of subsidies, support for road and rail transport in the European Union, Hungary and Switzerland was estimated at US$40 billion in 1998 (Nash et al. 2002), and rail transport is estimated to be relatively more subsidized than road transport.

Although appealing for economists, this concept is very difficult to reconcile with public finance and the way other practitioners define subsidies. This subsection therefore focuses on the more "conventional" measures of subsidies (namely, that do not include externality costs) to provide an understanding of the incidence of subsidies in the sector. An essential element to bear in mind when analysing data on subsidies to the transport sector is the distinction between government support to the industry (e.g. the support to private railways operator) and government investment in infrastructure. Whether or not the latter is included in the definition used to estimate the incidence of subsidies to the sector makes a big difference to the results.[272]

Rough estimates based on a definition of subsidies including direct financial transfers, tax breaks and the provision of infrastructure show that in OECD countries, subsidies to the transport sector amount to nearly one-third of total OECD subsidies. Transportation represents the second most important sector after agriculture in terms of the flow of subsidies, while in non-OECD countries the importance of transport subsidies is much lower – below 10 per cent of total non-OECD subsidies. However, it is difficult to assess the reliability of these estimates.[273]

269 See also Sections C and D.

270 The main programmes were the Department of Transportation's Essential Air Service (EAS) Subsidy Programme (under which approximately US$100 million was spent in 2002) and the grants provided to small communities under the Small Community Air Service Development Pilot Program (approximately US$20 million), under which funds were appropriated for the first time in FY 2002 (October 2001-September 2002). Under the EAS Program a community is eligible for subsidies if it is more than 70 miles away from the nearest medium or large hub airport, and if the service costs less than US$200 per passenger (WTO document S/WPGR/W/25/Add.4).

271 See WTO document S/WPGR/W/25/Add.4.

272 Some countries have notified transport subsidies to the WTO, but the country coverage is very limited. One reason is that to the extent that they are infrastructure subsidies, they are not included in the WTO definition of subsidies.

273 Data refer to the period 1994-98 and are obtained from van Beers and de Moor (2001) Table 3.1.

Official data for the EU show that state aid to the transport sector represents the largest share of total EU state aid. In 2001, 46 per cent of state aid was granted to the transport sector. In addition, in 2003, the largest share (15 per cent) of EU Structural Funds was allocated to transport infrastructure. EU state aid awarded to the transport sector as a whole, excluding railways, averaged €1.5 billion annually over the period 2001-03, up by 50 per cent compared to the period 1999-2001. Interestingly, support to the transport sector in the EU has been principally motivated by the need to develop the European transport network in order to reduce transport costs among EU Member countries and achieve deeper integration.

In the case of air transport services, state aid fell significantly after liberalization. From over €2.5 billion in 1994 and 1995, total state aid to the air transport sector dropped to €265 million on an annual average basis over the period 2001-03. There was an increase in support in the period 2001-03 relative to the previous period (1999-2001) on account of the special measures taken after 11 September 2001 (see WTO document WT/TPR/S/126). In order to assist the US aviation industry, the US federal government made available funds to compensate US air carriers' losses suffered as a result of the attacks.[274] By the time of the closure of this programme on 31 December 2002, the United States Department of Transportation (DOT) had transferred a total of just over US$4.6 billion to 426 US air carriers. In addition to the federal grants, the Act made available to airlines up to US$10 billion in federal loan guarantees.[275] Approximately US$1.6 billion in loan guarantees had been committed as of October 2003.

In general, the analysis of the motivation for subsidies to the transport sector differs across countries. Take maritime services, for example. The TPR report for Chile in 1997 records that, in general, maritime transportation services are not subsidized, with the exception of coastal transportation to isolated areas, where there is not enough demand to justify the existence of a regular shipping service. In the Republic of Korea, subsidies to maritime transport are motivated by regional development considerations; in Japan they are aimed at keeping up competition with the maritime industry of other countries that provide preferential tax treatment for their ships. In India, subsidies to the shipping industry are motivated by the need to develop the industry and in Indonesia investment incentives, such as income tax, value-added tax, and luxury tax exemptions are provided, for new investors in designated "pioneer" industries, such sea and air transport.

(ii) Telecommunications

A good deal of liberalization in telecommunication services took place in the late 1990s and early 2000s. For example, while in the early 1990s most telecommunication services were provided by monopolies (state or privately owned), by 2004 there were no countries with a monopoly for the provision of fixed network services remaining in the OECD area. This process of liberalization proceeded jointly with the development of regulations to guarantee the provision of universal access. Increasing competition erodes the ability of providers to cross-subsidize the provision of local services with revenue from inflated prices on long-distance and international services.

Almost every country has universal access to telecommunications services as a public policy goal.[276] An important difference exists in the definition of universal access objectives between developed and developing countries. While in developed countries the definition of the objective of universal access focuses on ensuring the "affordability" of the services to all, in developing countries it focuses on guaranteeing the "availability" of the service, including through expanding telecommunication infrastructure.

Depending on the importance of competition in the telecommunication sector, the maturity of the network, the existence of other infrastructure and the information available on the cost of universal access, various countries have adopted different measures to achieve the universal access objective.[277] The bill for the provision

[274] The Air Transportation Safety and System Stabilization Act is available online at: http://www.treas.gov/offices/domestic-finance/atsb/hr2926.pdf.

[275] See, for example, US General Accounting Office, GAO (2001).

[276] See also Section D.

[277] For further studies on trends and practices in universal services refer to the following website: http://www.itu.int/ITU-D/treg/related-links/links-docs/uso.html.

of universal services is either at the cost of the incumbent (like in the UK, Sweden, Finland and Japan), of new entrants or of the government, through the provision of subsidies.[278]

There is a global tendency to reduce government subsidies for the provision of universal services. A study of the OECD (2003c) claims that the importance of direct subsidies for universal telephone services is declining in OECD countries. For example in Australia,[279] the subsidy provided by the Government to Telstra for its universal service obligation fell from A$548 million in 1998 to around A$280 million in 1999 and 2000, and continued to fall in the subsequent years, to A$231.7 million in 2004.[280] However, recently the issue of extending the coverage of the definition of universal services to include services other than basic voice, such as emergency calls, long distance services, directory assistance and broadband internet have revived the issue of government-support policies in the telecommunication sector.[281]

Another example of the reduced importance of direct subsidies for universal access is that of Canada. In November 2000, the Canadian Radio-television and Telecommunication Commission (CRTC) established a national revenue-based contribution collection mechanism, whereby companies would contribute a percentage of their revenues that are considered to be contribution-eligible. The purpose of the contribution is to fund local telephone services in high-cost areas (i.e. rural and remote areas). Other than these subsidies, all cross-subsidies have been eliminated in the telecommunications industry, and competitive services offered by incumbent operators are not being subsidized by other monopoly or near-monopoly service offerings.

Around the world, the financing of universal service obligations is increasingly carried out through Universal Service Funds (USF). Initiated in Chile and Peru, the USF approach is increasingly seen as the best option in both developed and developing countries.[282] Over 60 countries worldwide now have USFs in place. In general, the fund is financed by a tax on telecommunication sector operators, general tax funds or sale of resources such as privatization or sale of licences. The latter is the case for example of the United States. In Europe, France and Italy have set up USFs. Table 36 provides an indication of the incidence of USFs in some Latin American countries. Among the countries reported in the Table, Chile and El Salvador rely mainly on government subsidies to fund USFs. Box 11 in Section D provides further information about the Chilean experience.

There are also USFs in African countries, including Madagascar, Mauritania, Niger and Togo.[283] Information reported in the TPRs indicates the intention of the Governments of Botswana and Namibia to set up USFs.

Information collected on the basis of the TPR reports appears to indicate that while in North America, Western Europe, Latin America (excluding the Caribbean) and Africa subsidies to the telecommunication sector are principally aimed at providing universal access, the stated objective in Asian and Caribbean countries includes the development of the network (e.g. Singapore, St. Kitts and Nevis), job creation (Trinidad and Tobago) and fostering investment (e.g. India). Interestingly, incentives to the development of the telecommunication sector include the establishment of technology parks (St. Kitts and Nevis), enterprise zones (Trinidad and Tobago) and export processing zones (St. Lucia).

278 Note that subsidies here would indirectly subsidize the consumer, via the company, and not the industry.

279 WTO document WT/TPR/S104, p. 119, para. 98.

280 These figures approximate US$372, 176 and 165 million in 1998,1999 and 2004 respectively.

281 OECD (2003c)

282 The mechanism adopted in Peru, based on the "lowest bid wins" principle proved to be quite successful. According to this principle, the moneys gathered from mandatory levies on telecom operators' revenue, government budget, charges on interconnecting services, levies on subscribers or funding from international development agencies are put under the authority of an institution, which organizes competitive tenders for licenses to provide at least a minimum specific service within a given geographical area. For example, for the pilot project conducted in Peru (2000), the winning bid requested a subsidy 41 per cent lower than the administrative authority (Osiptel) had estimated and 74 per cent lower than the previous offer by the incumbent operator. More importantly, this financing scheme has attracted a significant amount of additional private investment. The pilot project in Peru required a subsidy of only 11 dollars per inhabitant, while mobilizing an estimated 22 dollars per inhabitant of private investment. In Chile, every one dollar of one-time government subsidy has attracted 20 dollars private investment in new rural facilities.

283 See ITU (2000).

Table 36
Universal service funds in selected Latin American countries
(Million dollars)

Country	Regulating authority	Source of finance	Period considered	Maximum subsidy available	Subsidy granted
Chile	Fondo de Desarrollo de las Telecomunicaciones	Government budget	1995-97	24.2	10.2
			1998-99	14.4	9.8
			2000	1.9	1.8
El Salvador	Telephone Investment Fund	Government budget	2002	...	5.5
Peru	Fondo de Inversión en Telecomunicaciones	1% operator levy	1998	4.0	1.7
			1999-2003	50.0	11.0
			2002-04	59.5	27.8
Colombia	Fondo de Comunicaciones	5% operator levy and government contribution	1999-2003	70.6	31.8
Guatemala	Fondo para el Desarrollo de la Telefonía	spectrum auctions[a]	1998	...	1.5
			1999	...	4.5
Dominican Republic	Fondo de Desarrollo de las Telecomunicaciones	2% operator levy	2001	3.8	3.4

[a] Guatemala's spectrum law has been effective because it has recognized property rights in radio waves, thus converting them into a new resource. In a nutshell, the spectrum reform brought about the creation of usufruct titles. Any person or company, national or foreigner could request title to a spectrum band not currently assigned to other users. The auctions have generated over $100 million in revenue. Seventy percent of these funds have been allocated by the state to subsidize rural telephone services (The Wall Street Journal, What Guatemala Can Teach the FCC, December 27, 2002).
Source: Intelecom Research, Universal Access Funds and Universal Service Funds: insights and experience of international best practice, July 2005-09-22.

(iii) Tourism

Tourism is one of the sectors most frequently targeted by services subsidies, according to the information collected from TPR reports. Subsidy programmes targeting tourism were mentioned in 62 of the 97 TPR reports completed between January 1995 and February 2004. Many developing countries consider tourism to be a sector with significant growth potential and governments wish to stimulate the sector by using subsidies. This is notably the case in Africa, a region that is widely recognized for the quality of its resource endowment for tourism, but where the industry is far from reaching its full potential, notwithstanding promising growth figures at the beginning of this decade.[284]

Table 37 categorizes information on subsidies in tourism according to the stated objective of the subsidizing authority. It reveals that in the subsidy programmes of a number of African Members, tourism is explicitly mentioned as one of the industries targeted in the context of the Member's development strategy. This is also the case in a number of Asian and Latin American countries. Subsidy programmes in some countries target exporting industries in general and the tourism sector is explicitly mentioned in this context. Poor infrastructure is one of the factors frequently blamed for the underperformance of the tourism industry in developing countries. Many African, Asian and Latin American Members use subsidies for investments in infrastructure relevant for the tourism sector.

In industrialized countries tourism subsidies are also frequently intended to be a development tool, though they tend to be used for regional development in those countries. Chart 14 is based on information from the European Union's Support Measures Database and shows that by far the largest part of support in the tourism sector occurs in the context of regional development programmes, implying that the tourism industry in a particular region is targeted. Support measures also frequently target SMEs. Although the information from the TPR reports and the EU Support Measures Database are not directly comparable and are not necessarily representative at the global level, this discussion indicates that the nature of the activities targeted within the tourism sector may differ significantly between industrialized and developing countries.

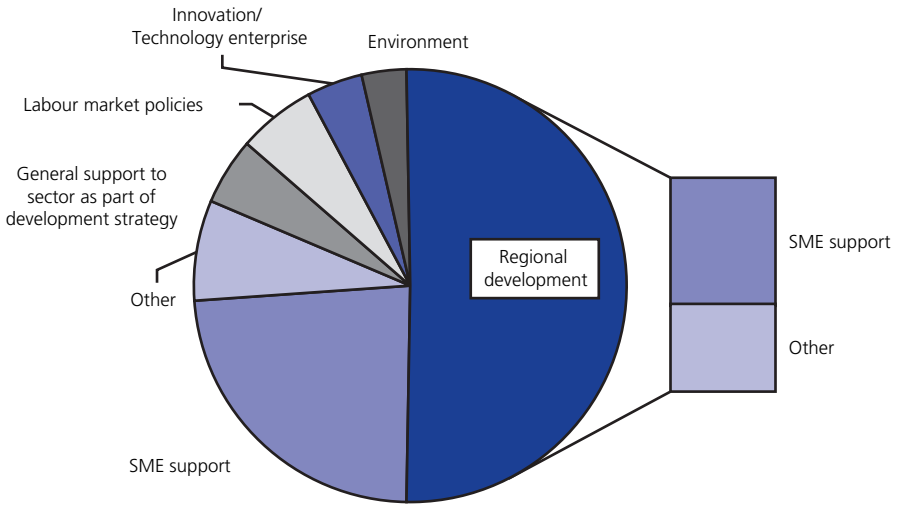
[284] Christie and Crompton (2001). The annual growth rate in international tourist arrivals in Africa has tended to outperform the growth rate for the world as a whole over the past decade. In particular, it is the only region that was able to record positive growth rates in 2001, 2002 as well as 2003, three years that have been particularly difficult for the tourism industry (World Tourism Organization, 2005).

Table 37
Tourism subsidies by region and stated objective

	North America and Western Europe	Central and Eastern Europe	Africa and Middle East	Asia	Latin America	Total
Tourism as a development strategy	Turkey		Lesotho Nigeria		Dominican Rep. Bolivarian Rep.of Venezuela Barbados	6
Support for exporters			Zambia	Philippines	Bolivarian Rep.of Venezuela	3
Support for infrastructure	Canada Turkey	Czech Rep.	Niger Egypt Senegal S. Africa	Brunei, D. Macau, China Sri Lanka India	Uruguay Solomon Is.	13
Support for hotel investment	Switzerland		Zambia Burundi Morocco Nigeria The Gambia Madagascar Ghana Mauritius Uganda Botswana Lesotho Kenya	Thailand	Bolivarian Rep.of Venezuela Honduras Guyana Costa Rica Dominica Grenada St. Kitt & Nevis Saint Lucia St. Vincent & the Grenadines. Haiti Jamaica Solomon Is. Trinidad &Tobago Nicaragua Barbados	29
Marketing support	Canada Turkey Switzerland Liechtenstein	Slovenia	Morocco Mauritius S. Africa Senegal	Thailand Indonesia	Honduras St. Vincent & the Grenadines Barbados	14
Eco-tourism + preservation of cultural heritage	Turkey		Burundi Gabon The Gambia S. Africa	Brunei, D. Thailand Singapore		8
Transport			Morocco Botswana Egypt Senegal	Macau, China	Costa Rica Bolivarian Rep. of Venezuela Honduras	8
SME support	Switzerland	Slovak Rep.	Gabon		Trinidad & Tobago	4
Training	Turkey		Morocco Botswana		Costa Rica	4
Labour market policy			Botswana Senegal		Haiti	3
Objective not explicitly mentioned	Iceland	Bulgaria	Israel Mauritania Mozambique Cameroon Guinea Malawi Tanzania	Australia New Zealand Hong Kong, China Indonesia (Rescue)	Guatemala Argentina Peru	16

Source: WTO Secretariat, in the light of information collected from TPR reports in S/WPGR/W/25/Add.1-4.

Chart 14
European Union (15) support to tourism by objective
(Percentage of total number of programmes)



Source: European Commission, Support Measures Database.

(iv) Financial Services

Financial services comprise five broad categories of services. These are banks, insurance, securities, asset management and financial information. In the past, these five types of services corresponded to categories of financial institutions. For example, the main activity of a bank was traditionally that of taking deposits and granting loans. Nowadays, capital markets and non-bank financial institutions also provide these services, while an increasing proportion of banks' revenues comes from fee-based services such as underwriting, trading, brokerage and advising on mergers and acquisitions.

Data available on the incidence of subsidies from national or supra-national sources, such as EU state aid data and the data provided by the Australian Productivity Commission, do not distinguish between banking and other financial services. For this reason, we treat the whole sector jointly. However, the fragmented information contained in TPR reports indicates that subsidies to the financial sector are concentrated in the banking sector.

Table 38 categorizes information on subsidies in the financial sector according to the stated objective of the subsidizing authority. It reveals that all regions provide assistance to the banking sector in order either to rescue or restructure the banking sector. However, while support to restructuring the sector in the context of privatization occurs in Eastern and Central Europe and Latin America, support for adjusting to international standards of capital ratios or for merging banks is mentioned as an objective in countries in Europe and Asia. Asian countries appear more often among those that explicitly mention the promotion of off-shore banking as one of the objectives for subsidies to the financial sector. Support for start-up financial institutions, for investments in micro-financing and promotion of foreign direct investments is concentrated among African countries.

In both industrialized and developing countries, restructuring aid has frequently been given to banks during the process of privatization. More generally, governments intervene to rescue a bank that is in trouble, thus avoiding bank closure or the sale of assets to new investors. The "systemic risk" related to bank closure is most of the time given as an argument for public intervention. Different definitions of systemic risk exist.[285] The Bank for International Settlements (BIS) refers to systemic risk as being "the risk that the failure of a participant to meet its contractual obligations may in turn cause other participants to default with a chain reaction leading to broader financial difficulties". This may occur, for example, if Bank A defaults on a loan, deposit, or other payment to Bank B. This default produces a loss greater than B's capital, and forces B to default on payments to Bank C with losses that are larger than C's capital, and so on down the chain. Note that banks, particularly within a

[285] See, for instance, Kaufman and Scott (2000).

country, tend to be closely interconnected through inter-bank deposits and loans. The danger of a systemic crisis is bigger, the larger the bank in trouble. It could therefore be argued that certain banks benefit from implicit state guarantees by virtue of the rationale that they are "too big to fail". This implicit guarantee may give the relevant bank a competitive advantage, for instance because it will positively affect its credit rating.[286]

Table 38
Financial services subsidies by objective and region

	North America and Western Europe	Central and Eastern Europe	Africa and Middle East	Asia	Latin America
Financing restructuring costs of privatization		Czech Republic			Brazil
Incentives to restructure, including merging operations and meeting standards of minimum capital ratios	Turkey	Poland		Malaysia India	
Rescue from crisis ailing institutions	Norway EC		Brunei Darussalam	Indonesia Thailand	Bolivarian Rep. of Venezuela Mexico Paraguay Peru
Assist financial institutions with excess bad debts	United States	Slovak Republic		India Korea, Republic of	
Establish regional and rural banks		Poland	Ghana		
Support public policy	United States				
Development of distressed regions					Trinidad and Tobago
Development of the sector through promotion of R&D and investments				Australia Singapore	
Promote off-shoring banking	Cyprus		Mauritius Morocco	Thailand Singapore Macau, China Australia	Jamaica Barbados
Promotion of micro-finance banks			Tanzania		
Support start-ups			Southern Africa Customs Union		
Promote foreign direct investment			Uganda		
Stabilize share prices				Hong Kong, China	
Other, non specified	EC Switzerland and Lichtenstein		The Gambia	New Zealand	Brazil Uruguay Costa Rica Saint Lucia St. Vincent and the Grenadines

Source: WTO Secretariat, in the light of information collected from TPRs in S/WPGR/W/25/Add.1-4.

In the European Union, for example, the financial sector figures prominently among the sectors receiving state aid. Between 1995 and 2003 the number of approved state aid cases to all sectors in the European Union was 86, of which 34 were rescues and 53 involved restructuring aid.[287] Construction and engineering was the sector most frequently in receipt of rescue and restructuring aid (10 companies). The financial services (nine companies) and machinery and equipment sectors (eight companies) were the next largest recipients. Most of the cases in the financial sector involved restructuring aid.[288] Restructuring cases involved banks in

[286] The triple-A rating from credit-rating institutions for German Landesbanken has, for instance, been related to the institutional guarantees these banks enjoy. It should, however, be noted that these guarantees are explicit.

[287] London Economics (2004).

[288] Rescue aid is intended to be short-term aid to keep an ailing firm afloat for the time needed to work out a restructuring or liquidation plan. This aid has to be reimbursed within 12 months. Restructuring aid, instead, should be based on a feasible, coherent and far-reaching plan to restore a firm's long-term viability.

different countries and included: Banco di Sicilia and Sicilcassa, Banesto, Crédit Lyonnais, Crédit Agricole, and Westdeutsche Landesbank.[289]

Data on the type of instrument used to subsidize the financial sector show they differ across countries. In the EU most subsidies to the financial sector take the form of equity participation, while soft loans, credit guarantees and tax exemptions represent only a very small share of total subsidies to the sector. In contrast, national data on subsidies to the financial sector in Australia show that about 90 per cent of total assistance to the financial sector took the form of tax concessions.

In order to have a view of the relative use of various instruments across regions worldwide, Table 39 reports the list of countries for which TPR reports have identified subsidies to the financial sector by type of instruments. Despite the limitations of these data[290], the Table indicates that subsidies to the financial sector in the form of equity appear more concentrated in Asia and Western Europe, while tax incentives are relatively more frequent among African and Caribbean countries. A third type of assistance exists in Germany, where certain publicly-owned banks enjoy institutional guarantees.[291]

Table 39
Form of subsidy to the financial sector
(Number of countries)

	Direct grants	Preferential credits and guarantees	Equity injection	Tax incentives	Duty-free inputs and free zones	Other unspecified measures	Number of members reviewed
North America	...	1	...	1	...	...	3
Western Europe	...	1	2	1	...	...	6
Central and Eastern Europe	1	2	1	1	...	2	6
Africa and Middle East	1	...	...	3	4	1	25
Asia and Oceania	1	2	4	7	2	2	17
Latin America and Caribbean	1	1	1	4	5	1	24

Source: WTO Secretariat, in the light of information collected from TPRs in S/WPGR/W/25/Add.1-4.

(v) Audiovisual services

In the classification list used for scheduling commitments under the GATS, the audiovisual sector includes services relating to motion pictures (e.g., production, distribution, projection), radio and television, and sound recording.[292] Typically, public intervention in the sector, including subsidies, are justified by the governments concerned on the basis of the pursuit of cultural objectives, such as the promotion of national and regional culture or minority culture, the protection of cultural heritage, social cohesion, and languages. Policy interventions can take the form of domestic content quotas, restrictions on the allocation of licences, foreign equity limitations, must-carry regulations, or public broadcasting, depending on the sectors and jurisdictions. Subsidies in the form of grants, tax incentives or financing at preferential rates are often used in support of television programming or sound recording, but are especially a common feature in the film industry.

The key tenet of subsidy programmes in the audiovisual sector appears to be the promotion of certain domestic content. Assistance targets production activities, but also more specifically distribution, exhibition, training, promotion, script writing or the use of new technologies. The source of financing varies by country. In many cases, assistance is channelled through the State or through a State-funded agency, sometimes at sub-national level, while in other cases assistance takes the form of requirements imposed on satellite or cable distributors to invest in domestic production, or of cinema admissions, television fees and lottery revenues which are channelled to support local production. Subsidies are typically awarded only if certain nationality

289 Detailed description available in Ehlermann and Everson (1999).

290 See Box 12.

291 See Box 1 in Section B for an overview of the types of subsidy instruments used in the banking sector.

292 See the Services Sectoral Classification List (WTO document MTN.GNS/W/120).

criteria are met, i.e., in addition to the recipient being established on the territory of the granting authority. Definitions may vary and take into account in different ways the internationalization of production. Criteria may include a combination of the following: national ownership and control of the company producing the content as well as the nationality of the director, the crew, the authors, the national relevance or sensitivity of the storyline, or the location where the content will be shot or produced. A more recent policy trend in the film sector in particular concerns the granting of incentives to attract the shooting of movies by foreign production companies in ones' territory.

Data on subsidies to the audiovisual sector are mainly available from national sources and are difficult to compare. Available information, principally from some developed countries, suggest significant levels of subsidies to the audiovisual sector. In Australia, for example, average subsidies to the film industry over the period 2001-04 represented more than 15 per cent of total services subsides. Available data also suggests that they have been increasing over time.[293]

Another source of data for subsidies to the audiovisual sector is provided by a recent study of the European Audiovisual Observatory (EAO) published in cooperation with the European Investment Bank (2004). The study reports total European public funding to the audiovisual sector, where public funding is defined as the money allocated by the public agencies to the TV and cinematographic sector, thus including money that does not derive from the local or central government budget.[294] These data show an upward trend in the public funding of the TV and cinematographic industry in Europe between 1998 and 2002. Since 1999, in EU (15) more than €1 billion has been awarded annually by public funding bodies to support various activities in film, television and multimedia. The five largest countries (France, Germany, Italy, Spain and the United Kingdom) represent 72 per cent of the overall European total. France alone accounted for 46 per cent of direct public funding in 2002. At the EU level, the MEDIA programme is equipped with a budget of about €400 million (period 2001-05) to support the audiovisual sector. It is intended to improve the competitiveness of the European audiovisual sector on both the European and international markets, to promote linguistic and cultural diversity in Europe, and to improve the transnational movement of European works.

In practice, for many countries, subsidies to the audiovisual sector are one of an array of policy tools used to promote domestic content and pursue cultural objectives. Subsidies are often used in conjunction with such restrictions as content quotas or foreign equity limitations. For example, the Canadian Radio-Television and Telecommunications Commission (CRTC) support for the sound-recording sector includes Canadian content and French language airtime requirements, contributions towards the development of Canadian talent, and requirements to offer tangible benefits to the music industry for certain ownership transactions. An example is that licensees of private radio stations are asked to make financial commitments to Canadian talent development as part of their renewal applications.

Views on the extent to which government intervention is needed or effective in attaining cultural objectives vary.[295] While, for example, some would justify government intervention on such grounds as the need to ensure the production of domestic audiovisual content and industries because of their contribution to social cohesion or identity, others would consider that limiting consumer choice, competition, and exchanges may be culturally counterproductive and economically inefficient.

293 Australian Government Productivity Commission (2004), Trade and Assistance Review 2003-04.

294 Other sources of financing include, for example, levy on cinema tickets, on cable TV operators, direct contributions from TV, etc.

295 See Section D.

F SUBSIDIES AND THE WTO

1. INTRODUCTION

We have discussed the economic arguments for and against different kinds of subsidization earlier in the Report. Economic analysis tells us that market failures of various kinds can sometimes be addressed efficiently with subsidies. It also tells us that subsidies can distort trade flows if they give an artificial competitive advantage to exporters or import-competing industries. Whether a subsidy is viewed as a desirable intervention for correcting a market failure or as an undesirable trade distortion depends sometimes upon who is making the judgement. But economic analysis ought to be able to help, both in determining the desirability of an intervention from a welfare perspective, and in assessing the merits of alternative forms of intervention. Governments may, however, decide to grant certain kinds of subsidies that have little to do with efficiency considerations, and in such cases economic analysis based on a simple welfare analysis may be of limited use. Also in these cases, the analysis is probably most helpful in ensuring that policy-makers are aware of the costs of pursuing particular objectives and of alternative, lesser-cost ways of doing so. We also know that judgements about what to subsidize, by how much and for how long are complex technical questions on which governments frequently lack adequate information.

These are among the issues that have influenced the shaping of GATT/WTO subsidy rules over the years, although of course these are trade rules rather than general economic rules, or competition rules, and thus have a trade focus. The next subsection (Section 2) discusses the evolution of the disciplines and introduces the three principal subsidy-related agreements that are currently administered by the WTO – the Agreement on Subsidies and Countervailing Measures (SCM Agreement), the Agreement on Agriculture (AoA), and the General Agreement on Trade in Services (GATS). Aspects of how subsidies are defined and various attempts by the WTO's legal organs to interpret these definitions are presented in Section 3, where the focus is on the SCM Agreement. Section 4 examines the developmental aspects of subsidies in relation to the WTO rules. Section 5 discusses subsidy disciplines in the context of the Doha negotiations. Section 6 contains some concluding observations.

2. EVOLUTION OF SUBSIDY RULES IN THE GATT/WTO

(a) GATT Article XVI

From the beginning, multilateral subsidy rules have focused on the potentially distortive effects of subsidies on trade flows, with any given subsidy disciplined or tolerated in direct relation to its trade-distortive potential. In the early years of GATT, however, the subsidy rules, which were contained in Article XVI, were neither well developed nor imposing.[296] The entirety of the first multilateral subsidy discipline was contained in Paragraph 1 of Article XVI of the GATT, which was taken from the Havana Charter. All Paragraph 1 required was that signatories should notify "any subsidy, including any form of income or price support, which operates directly or indirectly to increase exports of any product from, or to reduce imports of any product into, its territory…". The notification was required to specify the extent and nature of the subsidization, its estimated effects on exports and imports, and the circumstances making the subsidization necessary. If the subsidization was deemed to cause serious prejudice to the interests of any other party, the subsidizing contracting party was only required to discuss the possibility of limiting the subsidization. Thus, no form of subsidization was prohibited, but instead the focus was on the demonstration of trade effects – namely, serious prejudice to other countries' interests. Over the years, subsidy disciplines have become much more specific and imposing.

The first modification to the rules came in the 1955 Review Session of the GATT with the introduction of Section B of Article XVI, entitled "Additional Provisions on Export Subsidies". Section B reflected increasing concern about the potentially trade-distortive effects of certain subsidies – specifically export subsidies, as reflected in its preambular paragraph (Article XVI:2), which reads:

[296] Other original GATT provisions relevant to subsidies, and countervailing duties, are to be found in: (i) Article II:2(b), which allows anti-dumping and countervailing duties that exceed tariff bindings; (ii) Article VI, regulating countervailing duties; and (iii) Article III:8(b), which exempts subsidies from the non-discrimination obligations of national treatment.

"The contracting parties recognize that the granting by a contracting party of a subsidy on the export of any product may have harmful effects for other contracting parties, both importing and exporting, may cause undue disturbance to their normal commercial interests, and may hinder the achievement of the objectives of this Agreement [the GATT]."

With this new focus on export subsidies came the first differentiation of the subsidy rules in respect of primary versus non-primary products.[297] In the case of primary products (which included agricultural products), contracting parties were to "seek to avoid" using export subsidies, and if they did use them, not to do so in a way that would garner for the subsidizing party "more than an equitable share of the world export trade in the product" in question, taking into account representative historical trade shares and any special factors. This was, therefore, not a prohibition, but a trade effects test. Indeed, only now, in the Doha negotiations, are WTO Member governments poised to declare all export subsidies on agricultural products illegal, as the AoA only prohibits, under Articles 3.3 and 8, export subsidies that are in excess of budgetary outlays and quantity commitment levels which have been specified in Members' Schedules.

As for export subsidies on non-primary products, Paragraph 4 of Section B of Article XVI decreed a prohibition as from 1 January 1958, or as soon as practicable thereafter, on export subsidies that resulted "in the sale of [a non-primary] product for export at a price lower than the comparable price charged for the like product to buyers in the domestic market". Most GATT contracting parties did not comply promptly with this prohibition, leading to the establishment of a Working Party on Provisions of Article XVI:4 which reported in 1960[298] and produced a draft Declaration Giving Effect to the Provisions of Article XVI:4.[299] In its report, the Working Party developed a non-exhaustive list of measures considered to be export subsidies of the type that would be prohibited pursuant to Article XVI:4.[300] Only 17 contracting parties accepted the Declaration, which came into force for them on 14 November 1962. While the subsequent Tokyo Round Subsidies Code extended the prohibition of export subsidies on non-primary products to additional contracting parties, it was not until the Uruguay Round Agreement on Subsidies and Countervailing Measures entered into force in 1995 that the prohibition on export subsidies on non-agricultural products became fully institutionalized, albeit with certain exceptions and implementation periods for developing and transition economy countries.

This asymmetry in the treatment of subsidies on primary and non-primary products reflected the interests of dominant GATT contracting parties at the time, and has been a source of contention ever since. No economic logic supports the notion that subsidies on primary products are intrinsically more justified than subsidies on non-primary products. If anything, the logic may go in the opposite direction, considering the infant industry argument for protecting manufacturing activities in the early stages of industrial development. We shall return to this issue below.

(b) The Tokyo Round Agreement (Subsidies Code)

After the modifications to Article XVI of the GATT in the 1955 Review Session and the 1960 Declaration Giving Effect to the Provisions of Article XVI:4, the next big step forward in subsidy rule-making emerged from the Tokyo Round, in the form of the Agreement on Interpretation and Application of Articles VI, XVI and XXXIII, known as the Subsidies Code, which entered into force on 1 January 1980. The Code only applied to those contracting parties that decided to sign it.[301] More contracting parties accepted the Code than had accepted the 1960 Declaration.

297 For purposes of Article XVI, primary products were defined as "any product of farm, forest or fishery, or any mineral, in its natural form or which has undergone such processing as is customarily required to prepare it for marketing in substantial volume in international trade". See Interpretative Note 1 to Section B of Article XVI of the GATT.

298 GATT BISD 9S, 185.

299 GATT BISD 9S, 32.

300 This list was the precursor to the Illustrative List of Export Subsidies, contained in Annex I to the WTO SCM Agreement.

301 Twenty-four countries ratified the Code. Some of these did so with reservations and exceptions.

The Subsidies Code confirmed the prohibition of export subsidies on non-primary products, the scope of which excluded mineral products. In addition, the Code introduced an illustrative list of export subsidies. This list, which built on the list contained in the 1960 Working Party report, represents the first explicit attempt to define subsidies in GATT treaty text, albeit only in respect of export subsidies, and only via a non-exhaustive itemization of certain interventions. The Code also elaborated certain rules pertaining to adverse effects, and contained special and differential treatment (S&D) provisions for developing country signatories.

The Subsidies Code introduced more detailed rules pertaining to countervailing measures (the basis of which is Article VI of GATT), notably in respect of procedures associated with countervailing duty investigations and standards for determining whether subsidies were a cause or threat of material injury.

(c) The Uruguay Round Agreements relevant to subsidies

(i) The Agreement on Subsidies and Countervailing Measures

The SCM Agreement had far-reaching implications, both in its substantive modifications to subsidy disciplines and in the fact that, by virtue of the "Single Undertaking", the new Agreement applied to the entire WTO membership. The new Agreement defined subsidies for the first time and further elaborated on subsidy disciplines, classifying subsidies into three categories (prohibited, actionable and non-actionable).[302] It also developed definitions, concepts and methodologies relating to adverse effects, and established procedural rules for multilateral remedies. The Agreement expanded and developed existing procedural and substantive rules on the use of countervailing measures.

Members hoped that this added precision would increase the certainty and predictability of the rules, and thus help to constrain the use of trade distortive subsidies. Similarly, they hoped that the clarifications to the countervail rules would help to ensure that such measures were only used when warranted. As an integral component of these disciplines and rules, Part VII of the SCM Agreement sets out enhanced provisions on notification and surveillance – that is, transparency provisions (a feature of the WTO rules in all policy areas). As discussed in some detail in Section E, available information on subsidies has oftentimes been incomplete or non-existent, notwithstanding the obligations set out in this area. This represents a serious lacuna in WTO practice in an important policy area.

As noted above, by virtue of the "Single Undertaking", the subsidy rules applied to all Members, implying considerable additional obligations for developing countries, particularly for those that had not been parties to the Tokyo Round Code. To modulate this impact, the SCM Agreement contains extensive S&D provisions. As we shall see in the discussion below, these provisions have received attention in the broader debate about "development space" under the trading rules.

Turning to the basic structure of the Agreement, it should be noted, first, that the concepts of "subsidy" and "specificity", which are found respectively in Articles 1 and 2, are key to the entire Agreement. They define which measures are subject to the multilateral subsidy disciplines, including remedies. Article 1 of the SCM Agreement states that a subsidy is deemed to exist if a financial contribution or income or price support is provided by a government, and a benefit is thereby conferred, and that such subsidy is subject to the Agreement if it is "specific". Article 2 defines the concept of specificity, which is deemed to exist when access to the subsidy is limited, explicitly or in fact, to certain enterprises.[303]

As noted above, the SCM Agreement had three categories of specific subsidies when it entered into force: prohibited, actionable (permitted, but potentially subject to action) and non-actionable (permitted, and shielded from action). Prohibited subsidies (see below) are irrebuttably presumed to distort trade. Certain kinds of subsidies within the actionable category were deemed, via a rebuttable presumption, to cause serious prejudice. In addition to the actionable subsidies in respect of which serious prejudice was presumed, other subsidies in the

[302] The so-called "traffic light" approach of red, amber and green light subsidies.

[303] Article 2.1(c) sets down the parameters for determining when subsidies that are not explicitly specific are specific *de facto*.

actionable category could be subject to remedial action by trading partners if they were demonstrated to cause defined kinds of adverse trade effects – namely serious prejudice, injury to the industry of an importing Member, or nullification or impairment of benefits. The difference between actionable subsidies rebuttably presumed to cause serious prejudice and other actionable subsidies turned on the question of where the burden of proof fell. Non-actionable subsidies were deemed to be non-specific within the meaning of Article 2 or to meet certain other specified requirements relating to their form and purpose. The latter encompassed certain research-related subsidies, regional subsidies and environment-related subsidies.

The provisions in the SCM Agreement on the rebuttable assumption of serious prejudice ("deeming" provisions) in the actionable category and on the non-actionable subsidy category were subject to review after five years. The provisions were not renewed and therefore lapsed on 1 January 2000, leaving only two categories of specific subsidies covered by the Agreement – prohibited and actionable.

Both these categories of subsidy may be challenged either through multilateral dispute settlement or through the imposition of countervailing duties. For multilateral challenges through dispute settlement, the complaining party must demonstrate either that the measure is a prohibited subsidy, in which case it must be withdrawn, or that the measure is an actionable subsidy that has caused adverse trade effects, in which case the measure must be withdrawn or its adverse effects removed. For countervailing measures, the importing Member must conduct an investigation which demonstrates that the subsidized imports are causing injury to its domestic industry.

Two types of subsidies are prohibited by the SCM Agreement: (1) export subsidies, and (2) local content or import substitution subsidies. Export subsidies are those that are contingent, in law or in fact, whether solely or as one of several conditions, on export performance. An illustrative list of certain export subsidies is annexed to the Agreement. Local content subsidies are those that are contingent, whether solely or as one of several other conditions, upon the use of domestic over imported goods.

These prohibitions are not new. As discussed above, developed countries had already accepted the prohibition on export subsidies in the 1960s under GATT Article XVI. Similarly, the ban on local content subsidies can be traced back to Article III:4 of GATT, on national treatment, specifically the prohibition on measures favouring the use of domestic goods. The main changes introduced in this regard by the SCM Agreement relate to the extension of these prohibitions (although subject to considerable S&D treatment) to all developing country Members and Members in transition, as well as the creation of a rapid (three-month) dispute settlement mechanism for complaints regarding prohibited subsidies. The prohibitions did not take effect immediately. For export subsidies, developed Members were allowed three years from the date on which the SCM Agreement entered into force to phase out prohibited subsidies, while developing countries and countries in transition were permitted longer transition periods.

These and other S&D treatment provisions for developing countries are set out in Part VIII of the Agreement, which consists of one article (Article 27) with 15 paragraphs. Concerning export subsidies, developing country Members that meet the criteria spelt out in Annex VII are exempted from the prohibition of export subsidies as set out in Article 3. These include Least-Developed-Countries (LDCs) as defined by the United Nations and a group of countries below a per capita GNP threshold as set out in paragraph (b) of Annex VII. Other developing country Members were allowed to retain their export subsidies for a period of eight years from the entry into force of the Agreement and subject to further conditions as spelled out in SCM Article 27.4. SCM Article 27.4 also contains a mechanism for developing country Members to seek extensions from the Committee on Subsidies and Countervailing Measures to the period for the use of export subsidies with annual reviews by the Committee of any extensions, and a final grace period of two years to phase out the measure if an extension is not granted after a review. By contrast, the longest transition period for local content subsidies, seven years, was not extendable, and thus all Members are now fully subject to the prohibition on these subsidies.

The S&D provisions on export subsidies described above were the subject of Ministerial Decisions on Implementation-Related Issues adopted in November 2001 at the Fourth WTO Ministerial Conference held in Doha. In one of these decisions, Members agreed to streamlined procedures for extensions under SCM Article 27.4 for certain developing countries.[304] These procedures are contained in a document[305] adopted via paragraph 10.6 of the Doha Ministerial Decision on Implementation-Related Issues and Concerns. The SCM Agreement is not silent on the impact of permissible export subsidies. SCM Articles 27.5 and 27.6 provide that the permitted export subsidies of developing Members (including those permitted by virtue of Article 27.4 extensions) must be phased out in respect of a particular product if the subsidizing Member achieves "export competitiveness" in that product. In another implementation decision by Ministers, Members reinterpreted the GNP threshold in Annex VII, and created a mechanism for Members listed in Annex VII to re-enter that Annex after graduation if their GNP level falls below the threshold.

Since the focus of this Report is on subsidies, we do not analyse further the countervailing duty remedy available to Members under these agreements. Suffice it to say that countervailing duties may be imposed on a subsidized product up to the estimated amount of the subsidy, provided that it is established, via a properly conducted investigation, that the subsidization causes or threatens material injury to an established domestic industry or materially retards the establishment of a domestic industry. As already noted, these provisions have been modified over the years. Much of the discussions and negotiations leading to these modifications have been conducted in the context of anti-dumping duties and then extended by agreement to countervailing duty provisions. Changes to the rules have included the elaboration of the requirements of an investigation, the calculation of the benefit amount from different forms of subsidization, the existence or threat of injury, and the establishment of causal links between subsidization and its effects on domestic industries.

(ii) The Agreement on Agriculture

The Agreement on Agriculture (AoA) that emerged from the Uruguay Round was the most complete attempt to date to frame explicit multilateral rules for agricultural trade. Separate provisions dealt with each of the three policy pillars defined in the Agreement – market access, domestic support and export subsidies. The latter two of these categories are relevant to subsidies as defined in this Report. Domestic support reduction commitments are expressed in terms of an aggregate measure of support (AMS) and entered into Members' Schedules of Annual and Final Bound Commitment Levels, with the exception of the subsidies in blue and green boxes. Export subsidies are simply defined as subsidies contingent upon exports, under Article 1(e). Article 9 of the Agreement does, however, make specific reference to particular measures such as stock disposal at non-commercial prices, marketing subsidies, subsidies to transport charges, and subsidies on agricultural products that are inputs to exported products.

The subsidy provisions on agriculture differ from those applying to non-agricultural products in two important ways. First, the AoA envisages reduction commitments on both domestic support measures and export subsidies. These commitments are conceptually comparable to the commitments traditionally made in negotiating rounds on import tariffs and have no counterpart in the non-agricultural sector, nor for that matter in the services area. Second, the reduction commitments on export subsidies underlie the reality that unlike subsidies on manufactures, the original efforts at disciplining agriculture protection did not contemplate the possibility of completely eliminating export subsidies. At the Sixth WTO Ministerial Meeting held in Hong Kong in December 2005, however, Members agreed to the elimination of export subsidies in agriculture by 2013.

In the detail of the AoA, a number of unique features are present in what many regard as a highly complex agreement. Domestic support commitments are distinguished in terms of the degree to which they are deemed to distort markets. There are so-called green, amber and blue boxes that determine subsidy reduction commitments. Green box subsidies are those that are the most divorced from production decisions – such as direct income payments – and are therefore not subject to reduction commitments under the AMS. The green

304 Decision on Procedures for Extensions Under Article 27.4 for Certain Developing Country Members. See para 10.6 of WTO documents WT/MIN(01)/17 and G/SCM/39.

305 G/SCM/39.

box subsidies must be funded out of government revenue (rather than charges to consumers) and must not involve any element of price support. The notion that they should be decoupled from production leads in the direction of non-specificity – a concept that is central to the SCM Agreement definition of subsidies, and as we argue elsewhere, crucial to an economic appreciation of the effects of subsidies.

Amber box subsidies are those that are regarded as the most directly trade-distorting and beyond a certain *de minimis* level, are subject to AMS reduction commitments. The blue box subsidies are a sub-category of amber box measures, but treated differently in terms of liberalization commitments. Blue box subsidies are those that may be deemed trade-distorting, but are contingent upon limitations in production. These subsidies are not included in the AMS. Much discussion is going on in the negotiations about how these different categories should be defined and what limitations should be placed on the exemption of measures from reduction commitments. The present Report does not attempt to provide a systematic analysis of these or other aspects of what is a complex and highly contentious negotiating process in the Doha Round.

The AoA also contains a range of S&D provisions, involving lesser liberalization commitments and higher *de minimis* thresholds. Least-developed countries have been exempted from making any trade liberalization commitments. Developing countries have been anxious to ensure that a situation of high dependency on agriculture is not complicated in any way by liberalization commitments and have therefore been emphasizing the desire for flexibilities in commitments. As regards trade liberalization by major agricultural production centres in developed countries, the developing countries face a mixed probable outcome. To the extent that trade liberalization, particularly involving subsidies, raises world prices, this will represent new profitable production opportunities for some and perhaps terms-of-trade losses for others (net food importers), at least in the short term. The latter risk is recognized by reference to the Uruguay Round Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net food-importing Developing Countries in Article 16 of the AoA.

Many commentators have noted the disparity in the treatment of subsidies in agriculture and the non-agriculture sector – for example the different treatment of export subsidies – and have questioned the rationale for the differences, particularly as they are perceived to work against developing country interests. From an economic perspective, it is far from obvious that agriculture subsidies in rich countries are any more defensible than subsidies on manufactures in developing countries. The different treatment is therefore probably most easily understood in terms of asymmetries in negotiating power. This problem, however, is being lessened as industrial countries adopt additional subsidy reduction and elimination obligations.

As far as subsidy remedies are concerned, the AoA had a "due restraint" clause (commonly referred to as the "Peace Clause") in Article 13, which exempted green box measures from countervail and multilateral challenge under the SCM Agreement, and which exempted domestic support measures and export subsidies in conformity with the Agreement from multilateral challenge under the SCM Agreement during the implementation period.[306] The remedies available in agriculture on the countervailing side are derived from the SCM Agreement and are no different from the remedy for non-agricultural products.

(iii) The General Agreement on Trade in Services

The General Agreement on Trade in Services (GATS) has adopted a very different approach to subsidy disciplines than that found on the goods side. In the first instance, it should be noted that Article XV of the GATS, which deals with subsidies, is primarily a negotiating mandate, not a set of rules. The Article calls for negotiations in recognition both that subsidies may distort trade and that they may have a role to play in development. The Article calls for recognition of the need for flexibility in this area. The negotiating mandate is also to consider the appropriateness of countervailing procedures. Members are required to exchange information on all subsidies related to trade in services that they provide to their domestic service suppliers. A right is also established under Article XV to seek consultations with another Member if its subsidy practices are considered to be the source of adverse trade effects.

[306] The implementation period for the purposes of the AoA was nine years from the beginning of 1995 (six years in respect of the rest of the Agreement).

In the absence of explicit subsidy disciplines, the question arises as to how far subsidy disciplines in fact exist as a result of the structure of the GATS.[307] The main point here is that a certain discipline on subsidies exists by virtue of the rules on non-discrimination – the most-favoured-nation and national treatment provisions. National treatment is particularly relevant, since Members can schedule national treatment commitments with respect to particular service activities in specified modes of supply. If these commitments do not contain explicit exemptions that permit subsidies to be granted in a discriminatory manner, then the national treatment principle will require that "like" foreign and national services and service suppliers must be given the same treatment in relation to subsidies. While this discipline does not directly regulate the granting of subsidies, it would arguably impose some restraint on the willingness of governments to subsidize.

This regulatory structure under GATS is different from the GATT, since Article III:8(b) of the GATT excludes goods subsidies from the purview of national treatment. What on the face of it might look like stronger GATS discipline than that on goods will not in fact amount to a significant difference unless Members have chosen to assume national treatment commitments in important sectors without any carve-out for subsidies.

Discussions on possible approaches to subsidy disciplines have not gone very far, although several delegations have recently suggested that an acceptable approach might be to use the SCM Agreement definition of subsidies, appropriately modified, as a working basis upon which to carry forward the negotiations.[308] This would certainly advance discussions. Another issue that has been of growing concern to some Members is the widespread disregard of the obligation under Article XV to engage in an information exchange on subsidies. This is a matter we have already referred to in this Section and in Section E. The absence of information on subsidy practices hampers the ability of governments to take informed decisions and renders progress in negotiations more difficult. In the particular case of services, some Members have proposed linking the adoption of a working definition of subsidies based on the SCM Agreement with an agreed format for submitting information on subsidy practices. This would certainly facilitate the task of preparing information for the information exchange exercise.

3. DISCIPLINING THE USE OF SUBSIDIES IN THE MULTILATERAL TRADING SYSTEM – THE SCM AGREEMENT

The discussion in Section C of this Report has shown that while subsidies can be welfare-diminishing distortive measures not necessarily motivated by purely economic considerations, they can also respond to less than perfect market conditions and market failures such as economies of scale, externalities and strategic interaction among monopolistic producers. How far do the WTO subsidy rules ensure that when subsidies are used, they serve an economically sound policy objective? And do the rules acknowledge the existence of other policy options to pursue the same objectives? These are the two questions this subsection looks at.

What the WTO subsidy rules do is to delimit particular aspects of a certain kind of government intervention and build a set of rights and obligations around this definition on the basis of the trade distortive impact of the measures. If one were to attempt to assess the utility of the definition in isolation, the result would look very different from an analysis that takes account of the wide range of other defined policies and rule sets that make up the WTO Agreement. The point is that the definition of a subsidy needs to be understood in the context of all the other rules that address Member governments' behaviour, the consequences of which could theoretically be defined, at least in part, as a subsidy outcome if broader subsidy definitions were employed.

As discussed in Section B, the SCM definition of subsidies does not cover subsidization resulting from border protection and from regulatory measures. This makes sense in the context of the multilateral legal framework as both of these other types of policy options are dealt with in other Agreements. This Section therefore provides a discussion of how the SCM Agreement deals with the potential trade-off between trade-distorting and welfare-enhancing effects of subsidies and compares this approach with the one taken in the other

307 See WTO document S/WPGR/W/9 of 6 March 1996 for a detailed analysis of this issue.

308 See, in particular, WTO documents Job(05)/4, Job(05)/5 and Job(05)96.

relevant Agreements. The discussion will also make reference to relevant provisions in the AoA and related case law.

Particular attention is paid in this Section to the objective of developing countries to encourage industrial development, and the question is asked whether and how the Agreements grant sufficient "policy space" to developing countries in this respect. The literature has already emphasised the possible negative effects of an unbalanced relationship between the disciplines on different policy options within the multilateral legal framework. Bagwell and Staiger (2004) have argued that tighter rules on subsidies introduced in the 1995 SCM Agreement might have done more harm than good to the multilateral trading system. The argument is based on the welfare theoretic proposition we discussed in Section C concerning optimal intervention. The proposition is that policy interventions should take place as close as possible to the source of the problem (market failure) they seek to address in order to minimize the generation of additional distortions in the market. If we abstract from import tariffs as a revenue source for a moment, the argument is that a tariff to protect an infant industry is an inferior policy intervention to subsidizing firms. Bagwell and Staiger argue that stronger disciplines on subsidies make them harder to use and may therefore have a "chilling" effect on additional market access commitments via reduced tariffs. Such an outcome implies welfare costs. That said, it is not clear that either form of prohibited subsidies would necessarily be the best or the only form of subsidy that could be used as an alternative to a tariff, nor is it clear that the actionable subsidy rules have reduced the incidence of actionable subsidies. The extent to which stronger subsidy rules have inhibited commitments to reduce tariffs is obviously an empirical matter in respect of which we have no evidence. But the essential point that choices among policy alternatives can matter is well taken.

(a) The identification of potentially trade distorting subsidies

Within the two categories of subsidies that are covered by the SCM definition of subsidies, i.e. different forms of government monetary transfers and the public provision of goods and services, not all subsidies are considered to be of concern for the multilateral legal system. Indeed, as discussed above, one would expect and it is in fact the case that only subsidies that create a certain level of trade distortion need disciplining. The SCM Agreement attempts to identify such subsidies first on the basis of the recipients, via the specificity rules, and second on the basis of how direct their impact is on trade flows, with the prohibition applying to those – export subsidies and import substitution subsidies – with the most direct such impact.

Although the definition of subsidies in the SCM Agreement is similar to definitions commonly found in the relevant literature and in national and international data sources, the WTO case law illustrates that it is not straightforward in practice to determine whether a given government policy falls under this definition or not. The concept of "specificity" is unique to the WTO Agreements and not commonly used in the relevant literature or statistics. This subsection therefore not only provides a discussion of the problems encountered in practice when identifying specificity, but also compares the term to related concepts in economic analysis.

(i) The definition of subsidies

Article 1.1 defines a subsidy in terms of "a financial contribution by a government or any other public body within the territory of a Member" either in the form of a direct transfer of funds or other forms discussed in Section B, including potential transfers of funds or liabilities, revenue foregone as a result of tax exemptions, the provision of goods and services by a government, other than general infrastructure, or the purchase of goods by a government. Finally, a subsidy would also be deemed to exist if a government entrusted or directed a private entity to carry out these functions or made payments to a funding mechanism. The approach taken in Article 1 indicates an intention to cover all possible forms in which governments can make financial contributions under the definition of subsidies. The difficulties of identifying subsidies in practice remain significant, given the variety of instruments governments can use to make "financial contributions". A subsidy is only deemed to exist if in addition to constituting a financial contribution, a measure also confers a benefit as specified in Article 1(b). Again, the establishment of the existence of such a benefit may pose difficulties, as illustrated in the relevant case law.

Various aspects of the list of financial contributions contained in Article 1.1(a)(1)(i)-(iv) of the SCM Agreement have been subject to dispute. For instance, a normative benchmark was found to be necessary in order to determine what constituted foregone tax revenue that is "otherwise due" as defined in Article 1.1(a)(1)(ii) of the SCM Agreement. Here, the Appellate Body held that the fiscal treatment of income subject to the contested measure needed to be compared with the treatment of legitimately comparable income. Importantly, for the purposes of this comparison, the Appellate Body confirmed that it might not always be possible to identify a general tax rule that would apply to the revenues in question in the absence of the contested measure.[309]

Also determining whether the granting body constitutes a government or other public body in the sense of the SCM Agreement has been the matter of dispute. This question was, for instance, taken up in *Korea-Commercial Vessels*, where certain granting bodies were government-owned financial institutions. The Panel in this case took the view that control of a body is an important criterion in determining whether an entity is a public body in the sense of Article 1.1(a)(1) of the SCM Agreement, and thus whether the SCM Agreement applies.[310]

In addition to the criteria for defining a financial contribution, the reference in Article 1.1(a) to any form of income or price support in the sense of Article XVI of the GATT 1994 merits further consideration. This is a reference to any support operating directly or indirectly to increase exports of any product from, or reduce imports into, a Member's territory. The precise definition of the notion of income and price support in this context has never been clearly specified.[311] However, the issue has been discussed at various points in relation to subsidy elements in domestic support prices, subsidies financed by a non-governmental levy, export credit programmes, internal transport charges, tax exemptions, multiple exchange rates and border tax adjustments.

A number of cases have dealt with the question of how to establish that a benefit has been conferred.[312] In *Canada–Aircraft*, the Appellate Body confirmed the Panel's finding that a financial contribution had to make the recipient "better off" than it would have been, and that the appropriate basis for comparison in this regard was the marketplace in order for a "benefit" in the sense of SCM Article 1.1(b) to exist, and thus for the measure to have trade-distorting potential.[313] That interpretation led the Appellate Body in *US–Lead and Bismuth II* and in *US–Countervailing Measures on Certain EC Products* to conclude that assets of a state-owned enterprise which the latter might have previously acquired with a "financial contribution" by the government, and then sold at fair market value in the course of privatization may be presumed not to confer a benefit on the purchasing firm. In *US–Countervailing Measures on Certain EC Products*, the Appellate Body further stated that "once a fair market value is paid for the equipment, its market value is redeemed, regardless of the utility the firm may derive from the equipment" (para. 102). However, in paras. 126-127, it cautioned that privatization at arm's length and for fair market value might result in extinguishing the benefit, but did not necessarily do so in every case – i.e. there was only a rebuttable presumption that the benefit ceased to exist after privatization.

309 "There must, therefore, be some defined, normative benchmark against which a comparison can be made between the revenue actually raised and the revenue that would have been raised "otherwise". We, therefore, agree with the Panel that the term "otherwise due" implies some kind of comparison between the revenues due under the contested measure and revenues that would be due in some other situation. We also agree with the Panel that the basis of comparison must be the tax rules applied by the Member in question." Appellate Body Report, *US –FSC,* paras. 89-91.

310 "If an entity is controlled by the government (or other public bodies), then any action by that entity is attributable to the government, and should therefore fall within the scope of Article 1.1(a)(1) of the SCM Agreement." Panel Report, *Korea–Commercial Vessels,* para. 7.50.

311 An important exception here is the 1958 case brought by Australia against France alleging export subsidization of wheat and wheat flour (BISD 7S/46, paras. 8-14). The Panel concluded that the French regime, which included elements of price support, constituted a subsidy.

312 Article 14 lays down guidelines for the calculation of the "benefit". This Article has been important for cases related to countervailing measures.

313 "We also believe that the word "benefit", as used in Article 1.1(b), implies some kind of comparison. This must be so, for there can be no "benefit" to the recipient unless the "financial contribution" makes the recipient "better off" than it would otherwise have been, absent that contribution. In our view, the marketplace provides an appropriate basis for comparison in determining whether a "benefit" has been "conferred", because the trade-distorting potential of a "financial contribution" can be identified by determining whether the recipient has received a "financial contribution" on terms more favourable than those available to the recipient in the market." Appellate Body Report, *Canada–Aircraft,* para. 157.

(ii) The specificity of subsidies

As indicated above, the SCM Agreement only aims at disciplining the use of subsidies that are "specific" according to the definition given in Article 2 of the Agreement. Most notably, a subsidy is to be considered "specific" if access to it is explicitly limited to certain enterprises. Conversely, if eligibility of enterprises is based on objective criteria and neutral conditions, which are economic in nature and horizontal in application, such as size,[314] and if eligibility for the subsidy is automatic, specificity does not exist.[315] Article 2 of the SCM Agreement acknowledges, however, that a subsidy programme may appear non-specific according to these principles, but may turn out to be specific in the way it is implemented. Thus, Article 2.1(c) illustrates some of the factors to be examined in that regard, such as the use of a subsidy programme by a limited number of certain enterprises or the manner in which discretion has been exercised by the granting authority in making the awards.

The Agreement does not say explicitly whether specificity refers to the recipients or the beneficiaries of subsidies. As discussed in Section B, the direct recipients of a subsidy are not necessarily its sole beneficiaries. Instead, some of the benefit may be "passed through" to others according to the legal terminology used in this context. This issue arose in *US–Softwood Lumber IV*:

> "Where a subsidy is conferred on input products, and the countervailing duty is imposed on processed products, the initial recipient of the subsidy and the producer of the eventually countervailed product, may not be the same. In such a case, there is a direct recipient of the benefit—the producer of the input product. When the input is subsequently processed, the producer of the processed product is an indirect recipient of the benefit—provided it can be established that the benefit flowing from the input subsidy is passed through, at least in part, to the processed product."[316]

Another issue that arises with respect to specificity is how to establish in practice that the range of beneficiaries of a subsidy is "specific" to "certain enterprises" or to a particular region, as opposed to "non-specific". The term "certain enterprises" refers to "an enterprise or industry or group of enterprises or industries". As a consequence, the identification of an "industry" may be important in establishing specificity in particular cases,[317] but the term industry is not defined in the Agreement. In *US–Subsidies on Upland Cotton* the fact that eligibility for a certain government programme was *de facto* limited to a subset of basic agricultural crops played a role in the determination of specificity with respect to Article 2 of the SCM Agreement. In *US–Softwood Lumber IV* the "wood products industries" were considered by the Panel to constitute at most a limited group of industries. *De facto* specificity also can be determined on the basis of the number of companies that actually use a government programme, as in the case of *EC–DRAMs Chips*, where the use of a subsidy programme by only six out of 200 eligible companies was the basis for a finding of specificity.

In the context of the discussions in Sections C and D, the question also arises how the term "specificity" relates to the concepts of trade distortiveness and welfare enhancement. The SCM text is predicated on the potential of specific subsidies to be trade distorting. Indeed, the more closely targeted a subsidy in terms of intended beneficiaries, the more concentrated will be its relative price effect. In many circumstances, this could be taken to imply a higher probability that the subsidy is distorting and less justifiable economically. A subsidy to a single industry, for example, rather than to many industries could impart a narrow advantage that does not reflect action in the face of a well defined market failure. The more broadly based subsidy recipients are defined, then, the more "spread out" and shallower will be the likely subsidy impact.

On the other hand, the discussions in Section D have shown that governments may wish to target subsidies as precisely as possible in order to correct for given market failures while avoiding undesired side-effects. At first

314 However, Article 2.2 of the SCM Agreement makes it clear that a subsidy that is limited to certain enterprises located within a designated geographical region is to be seen as specific.

315 Footnote 2 of the SCM Agreement clarifies that the conditions should be economic in nature and horizontal in application.

316 WTO document WT/DS257/AB/R paragraph 143.

317 The question of "industry" does not arise in all cases, as specificity also can be established on an enterprise basis, or on a regional basis.

glance, there appears to be a conflict. Yet, the SCM Agreement leaves room for targeting subsidies, depending on the criteria governments use for targeting. As the following discussion will show, certain criteria, i.e. export performance, are considered to be clearly linked to trade distortiveness, hence prohibited, while other criteria, i.e. objective criteria, may entirely exclude a given subsidy from the scope of the SCM Agreement. .

(iii) Prohibited subsidies: subsidies linked to export performance or the use of domestic goods

Definitional issues are also central to the concept of prohibited subsidies, since Article 2.3 of the SCM Agreement states that all prohibited subsidies listed under Article 3 – i.e. subsidies contingent on export performance or on the use of domestic over imported goods – are deemed to be specific. Once a panel has established that a government measure is a financial contribution that provides a benefit and falls within the scope of Article 3, then that measure is automatically specific. In practice, such subsidies can either be countervailed or challenged as illegal measures.

The Agreement thus takes the approach that subsidies directly targeting exports or import competition are by definition distortive and should therefore not be used. This makes economic sense, given that market failures are typically not related to the activity of exporting or of competing against imports. The economic literature discussed before, however, indicates that exceptions to this rule may exist. In particular, there seems to be evidence of the existence of spillovers from exporting and of information asymmetries specifically related to the activity of exporting. Export promotion policies have been justified in the literature on the basis of these market failures. In addition, as pointed out before, in the case of developing countries the use of export-oriented policies is sometimes defended on practical grounds if alternative instruments are not available or are too difficult to use. The question thus arises whether the approach of prohibiting export subsidies restricts developing countries in their possibilities to pursue certain policy objectives. This will be discussed in more detail below.

Article 3.1(a) of the SCM Agreement prohibits export subsidies contingent on export performance in "law or in fact". Where the wording of the relevant legislation expressly makes a subsidy contingent on exporting, a perhaps unlikely occurrence in practice, no detailed analysis of the situation is required.[318] Consequently, a considerable amount of the jurisprudence relating to Article 3.1(a) has focused on an interpretation of *de facto* contingency, especially since footnote 4 states that "the mere fact that a subsidy is granted to enterprises which export shall not for that reason alone be considered to be an export subsidy within the meaning of this provision".

Establishing whether subsidies are contingent in fact on exporting is not a straightforward exercise in practice, as the extensive case law on this question illustrates. The view that a measure should not be classified as an export subsidy simply because it is a financial contribution to a firm with high export propensity was expressed by both the Panel and the Appellate Body in *Canada-Aircraft*.[319] Instead, the Panel proposed a "but for" test for *de facto* export contingency, namely that if a subsidy would not have been paid "but for" the anticipation that exports would flow therefrom, then that subsidy was contingent in fact on exportation.[320] A similar view was held by the panellists in *Australia-Automotive Leather II*, where the measure at issue was a grant by the Australian government to a firm on the condition that it meet specified sales targets. Since the total domestic market was far smaller than the size of the sales targets, the Panel concluded that the grant was, in fact, contingent on exporting, as international sales constituted the only means by which the firm could meet the sales targets. The panellists referred to this link as one between the grant of the subsidies and the government's "anticipation" of exportation.[321] Furthermore, the

[318] One example is the *Brazil-Aircraft* dispute, which involved below-market financing by the government for aircraft export transactions. Brazil did not contest that the measure was, explicitly, an export subsidy. Brazil's defence instead was that, as a developing Member, it had the right to provide such subsidies. This aspect of the case is discussed in more detail below.

[319] "Putting this into more concrete terms, we consider that the factual evidence adduced must demonstrate that had there been no expectation of export sales (i.e. "exportation" or "export earnings") "ensuing" from the subsidy, the subsidy would not have been granted. To us, this implies a strong and direct link between the grant of the subsidy and the creation or generation of export sales." Panel Report, *Canada–Aircraft,* para 9.339.

[320] "[W]e consider that the factual evidence adduced must demonstrate that had there been no expectation of export sales (i.e., "exportation" or "export earnings") "ensuing" from the subsidy, the subsidy would not have been granted." Panel Report, *Canada–Aircraft,* para. 9.339.

[321] Australia – Subsidies Provided to Producers and Exporters of Automotive Leather, Panel Report, WT/DS126/R, adopted 16 June 1999, DSR 1999: III, 951.

decision in *US-FSC* showed that it does not matter for export contingency that foreign produced goods are also eligible for a certain subsidy. Instead, it does matter that among the domestically produced goods, only those that are exported are eligible.

(b) Acknowledging domestic policy objectives

As described above, the Uruguay Round SCM Agreement originally contained what became known as the "traffic light approach" to disciplining different kinds of subsidies. The red light referred to the prohibited subsidies discussed above.[322] The amber light covered subsidies that, although permitted, could be challenged if they caused specified kinds of adverse effects, with a sub-category (dark amber) of subsidies that were rebuttably presumed to cause one kind of adverse effects, i.e. serious prejudice.[323] These latter subsidies were: subsidization in excess of 5 per cent of the value of a subsidized product; subsidization to cover operating losses (other than certain one-time payments), and subsidies in the form of direct forgiveness of debt.

Finally, green light subsidies were certain subsidies which, while specific[324], were non-actionable, i.e. they could not be countervailed or subject to multilateral challenge. These subsidies were: certain assistance to research activities; certain assistance to disadvantaged regions; and certain assistance to promote the adaptation of existing facilities to new environmental requirements.[325] The conditions and criteria for obtaining non-actionable status for subsidies of these types were detailed and demanding, and in fact the provisions were never used.

That said, the original structure of the SCM Agreement, and in particular its special treatment of these three socially "good" types of subsidies, reflected a recognition by the negotiators of three of the policy objectives discussed in Section D for which a case in favour of subsidization can be made. For analytical purposes two aspects are worth noting. The first is the choice of objectives that find explicit mention. R&D activities are covered in this list, in a rather comprehensive way. In contrast, only a certain type of environmental subsidy is covered. Regional support is also covered, which this Report considers to be an instrument to pursue redistribution. The objective to pursue industrial development is not explicitly mentioned, but it could be argued that it was taken into account in both the non-actionable provision for regional assistance and in the S&D provisions of the Agreement which will be discussed in more detail below.

Nevertheless, Members' ability to use these kinds of "benign" subsidies was not completely unconstrained. While no countervailing measures or WTO dispute settlement could be used against such subsidies, there was nevertheless, in SCM Article 9, a provision for consultations and eventual referral to the SCM Committee, to address cases in which a non-actionable programme caused serious adverse effects to the domestic industry of another Member, in spite of being in full conformity with the rules for non-actionability. Thus, even here the trade-distortive potential of subsidization was taken into account in the rules. This is similar to the rules in other areas, where the WTO provisions tend to require Members to use various measures in the least trade-distortive way possible. Article 2.2 of the Technical Barriers to Trade Agreement, for instance, specifies that: "technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create". The same Article explicitly mentions the objectives of national security, the prevention of deceptive practices, protection of human health or safety, animal or plant life or health and the environment.

More generally, according to Article XX of the GATT, Members can pursue a number of specified policy objectives as long as the measures they use are not "applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade". The protection of human, animal or plant life or health figures among the objectives explicitly

322 These provisions did not, however, override the AoA.

323 The red and amber categories were relevant for purposes of multilateral remedies, the relevant provisions for which are found in Article 4 in respect of prohibited subsidies, and Articles 5, 6 and 7 in respect of adverse effects, defined as injury, serious prejudice and nullification or impairment of benefits. Since the lapse of the non-actionable category, countervailing measures can be applied to any specific subsidy, whether categorized as prohibited or actionable, pursuant to the applicable rules and procedures.

324 The provisions on non-actionable subsidies also referred to the fact that non-specific subsidies were non-actionable, but this was simply confirmation of what is in any case provided in Article 1.2.

325 Article 8.2 of the SCM Agreement.

mentioned in this Article and so does the conservation of exhaustible natural resources.[326] While Article XX in principle would appear to apply to subsidies, the more specific rules of the SCM Agreement in any case are explicitly geared to remedying trade distortions arising from subsidization.

The SCM Agreement's special treatment of certain subsidies aimed at socially beneficial policy objectives ended as of 1 January 2000, with the lapsing of the non-actionable subsidy category.[327] Thus, since that time all specific subsidies covered by the SCM Agreement that are not prohibited are actionable. Thus, the formerly non-actionable subsidies, while still permitted, now can be challenged, either through WTO dispute settlement or through the imposition of countervailing duties, provided the complaining Member can show that they are causing adverse effects to its interests. The implication is that while certain domestic policy objectives could explicitly be used as a justification for, and protection of, the use of certain specific subsidies before January 2000, after this date policy objectives no longer give rise to special treatment for any type of specific subsidy. Instead, the only way at this point for a subsidy (i.e. a financial contribution that confers a benefit) to be beyond the reach of countervailing measures or WTO dispute settlement is to be non-specific. All specific subsidies, while remaining permitted, can be countervailed (subjected to a border measure in an importing country) or subject to multilateral remedies (withdrawal, or removal of the adverse effects) if they give rise to adverse trade effects. In particular, no reference is made to the need to balance the effects on trading partners with Members' interests in pursuing certain policy objectives.

Concerning the feasibility of designing subsidies for particular policy objectives (e.g. environmental) as non-specific, it is worthwhile recalling the SCM Agreement's pertinent requirements. In particular, SCM Article 2.1(b) provides that specificity shall not exist where "the granting authority, or the legislation pursuant to which the granting authority operates, establishes *objective criteria* or conditions governing the eligibility for, and the amount of, a subsidy, ..., provided that the eligibility is *automatic* and that such criteria and conditions are *strictly adhered to*." Footnote 2 to this Article defines such objective criteria or conditions as "criteria or conditions which are neutral, which do not favour certain enterprises over others, and which are economic in nature and horizontal in application, such as the number of employees or size of enterprise". These are the conditions that would need to be strictly respected for any subsidy with a particular policy objective to be free of the risk of counteraction by other Members.

(c) Challenging actionable subsidies

Actionable subsidies, like prohibited subsidies, can either be challenged via WTO dispute settlement (although with different burdens of proof and different remedies),[328] or subjected to countervailing measures if they can be shown to cause or threaten injury to the domestic industry in the importing country. The existence of these remedies seems likely to inhibit the use of illegal subsidies and to restrain the amount of subsidization that might otherwise be provided via permitted subsidies. Depending on the particular situation, this reduced subsidization as well as any remedies imposed to offset subsidization that is granted, might have either positive or negative welfare effects. Where a countervailing measure is the chosen remedy, the subsidy in effect is simply converted into a transfer from the treasury of the exporting country to the treasury of the importing country – in other words, a waste of resources from the national perspective of the exporting country.

326 The measures must besides be "necessary to" or "related to" the policy objective, which imposes further restrictions on the use of such measures.

327 The non-actionable provisions (SCM Articles 8 and 9), as well as the dark amber presumed serious prejudice provisions (SCM Article 6.1) applied for a provisional period of five years from the entry into force of the WTO Agreement, per SCM Article 31. These provisions could have been extended, in their original form or with modifications, by consensus of the SCM Committee. The Committee did not reach such a consensus, and the measures therefore lapsed at the end of the five years.

328 For a prohibited subsidy, no adverse effects need to be proven in dispute settlement. Rather all that is required is to prove that the measure falls within the definition of a prohibited subsidy. The mandatory multilateral remedy for a prohibited subsidy is that the subsidizing Member must withdraw the subsidy, without delay. For an actionable subsidy, however, it is necessary to prove adverse trade effects in respect of a particular product in a particular market where the subsidized goods compete. The multilateral remedy for an actionable subsidy, in contrast to that for a prohibited subsidy, is that the subsidizing Member must, at its option, either withdraw the subsidy or remove its adverse effects. In the latter case, the Member would take some corrective action to address the adverse trade effects that have been found (which as noted are in respect of a particular product in a particular market) while leaving in place the subsidy itself (which might also operate in respect of other products and/or markets about which no adverse effects have been alleged or proven).

The countervailing measure provisions, like the anti-dumping rules, seek to strike a compromise between producer and consumer interests. From the consumer's perspective a countervailing duty raises import prices and represents a cost. That said, the permissible level of countervailing is not unlimited. The maximum level is the amount of estimated subsidization of the product. For producers, countervailing duties offer an additional margin to raise domestic prices. Standard economic analysis would question why producers should enjoy the protection implicit in the countervailing duty action, since on the face of it this imposes a welfare loss on the economy. The defence of countervailing duties therefore requires an argument as to why the deadweight losses to the economy of a trade restriction should be accepted. The standard argument for justifying such an intervention turns on the presence of some kind of externality or market failure. In the case of measures taken against dumping or subsidization, an additional consideration might be that sales are occurring at below cost with the strategic intention of eliminating competition in order to be able to exercise monopolistic pricing practices in the future. The arguments around these issues have been well developed in the literature and widely written about. For our purposes, it is sufficient to note that the potentially inhibiting effect of anti-subsidy remedies (both multilateral and countervail) can mean more or less welfare in both exporting and importing countries, and that the welfare effects may or may not go in opposite directions for the exporting and importing countries.

In order to obtain a multilateral remedy against an actionable subsidy, the existence of an adverse effect in the sense of Article 5 SCM needs to be established, i.e. injury to the domestic industry of another Member (the same standard as applies for countervailing measures), or serious prejudice to the interests of another Member, or nullification or impairment of benefits accruing directly or indirectly to other Members under GATT. Furthermore, pursuant to SCM Article 6.3, there are four bases on which serious prejudice can be established: displacing or impeding imports of another Member into the subsidizer's market; displacing or impeding exports of another Member from a third country market; significant price suppression or depression, significant price undercutting, or significant lost sales, in any market; and an increase of a subsidizing Member's world market share for a primary product or commodity.

WTO case law illustrates that establishing the existence of such adverse effects is not a straightforward matter in practice. Given the reliance on quantification in this Article, and the information-gathering process for serious prejudice provided for in Annex V to the SCM Agreement, data and quantitative analysis have played an important role in the panel process. One of the key cases to date addressing "serious prejudice" in the form of price suppression (Article 6.3 (c)) and increases in world market share (Article 6.3 (d)) was *US–Subsidies on Upland Cotton*. In this case, Brazil alleged that several of the US government support programs for US cotton producers seriously prejudiced Brazil's interests in respect of cotton. The Panel in this case, in analysing the situation, took the view that the empirical effects of the government support programs should be taken in their entirety as opposed to individually.[329] By conducting such a cumulative assessment of the subsidies at issue, the Panel acknowledged that a multiplicity of subsidies may affect any given product, and that from the perspective of the trade interests of other Members it is their total effect that matters.

4. SUBSIDIES TO PURSUE DEVELOPMENT STRATEGIES AND THE WTO PROVISIONS

The S&D provisions contained in Article 27 of the SCM Agreement include a specification of conditions under which some developing countries are permitted to apply export subsidies to manufactured goods, longer phase-out periods for non-complying export subsidies and subsidies contingent on the use of domestic inputs, restrictions on use of multilateral remedies against developing Members' subsidies, special minimum thresholds for subsidy levels and trade volumes in the context of countervailing duty actions against developing country exports, and exemption from the provisions of Part III of the Agreement (actionable subsidies) in respect of debt forgiveness, subsidies to cover social costs and liability transfers, when associated with privatization.

[329] The panellists were also of the view that when examining the impact of the measures, they were allowed to combine prohibited subsidy measures with actionable subsidy measures – the difference simply was that an offending measure had different options for remedy.

It is clear from the preambular language in Article 27.1 – "[s]ubsidies may play an important role in economic development programmes of developing country Members" – that the motivation for the S&D provisions in the Agreement is to allow developing Members the flexibility to use subsidies as a tool of development. The adequacy of these S&D provisions nevertheless continues to be debated. One side of the debate argues that the provisions are too lenient in regard to the use of trade-distorting subsidies. The other side argues they are too stringent and restrict the ability of developing countries to meet their development objectives, particularly as certain transition periods have expired.

The call by certain developing Members for expanded and prolonged flexibility to use subsidies, particularly export subsidies, was the subject of considerable attention in the lead-up to the Fourth WTO Ministerial Conference in Doha. In November 2001, at Doha, Ministers took a set of decisions in response to this call. One set of decisions pertains to Annex VII, which lists certain developing Members that are allowed to use export subsidies until they graduate from the Annex on the basis of specified economic criteria. The other set of decisions established a special "fast track" mechanism that could be used by certain developing Members not listed in Annex VII to obtain extensions of the transition period for the use of export subsidies pursuant to SCM Article 27.4.

On Annex VII, the decisions by Ministers interpreted the per capita GNP threshold such that it is measured in constant 1990 dollars and must be exceeded for three consecutive years before a listed Member graduates from Annex VII. Thus graduations would tend to be somewhat later, and somewhat less abrupt than before this decision. In addition, the decisions allow Members that have graduated from Annex VII to be readmitted, and thus to become re-eligible to use export subsidies, in the event that their per capita GNP falls below the specified threshold.

Concerning extensions under Article 27.4 of the transition period for the elimination of export subsidies, the decision adopted by Ministers at Doha established fast-track procedures aimed at providing additional time and more predictability for certain (non-Annex VII) developing Members to use specified export subsidies. The export subsidies of particular concern were tax incentives offered in export processing zones (EPZs) and the Members seeking extensions had argued that the year-by-year extension process envisaged in SCM Article 27.4 was simply too uncertain for their investors to be able to make longer-term investment decisions. The fast-track procedures responded to these concerns by simplifying the substantive criteria for demonstrating the need for an extension, and by establishing a quasi-automatic annual continuation of extensions granted for a period of five years.

Pursuant to Article 27.4, the last date on which any developing Member could have requested an extension was 31 December 2001,[330] and the extensions that have been granted by the Committee on Subsidies and Countervailing Measures are in respect of particular, identified subsidy programmes. The extensions were made subject to annual review by the Committee. Taken together, the extensions that have been granted by the Committee can be divided into three major categories, according to their legal basis:

- First, some decisions were based only on the special fast-track procedures adopted by Ministers in November 2001 (document G/SCM/39). As noted above, these decisions provide for quasi-automatic annual extensions of the eight-year transition period of Article 27.2(b) to the end of 2007.[331] Only developing Members with a trade share and GNP below specified thresholds were eligible to use these procedures, and only in respect of export subsidies taking the form of full or partial exemptions from internal taxes and import duties.

- Second, a decision taken in respect of a single Member was based on the special procedures in G/SCM/39 and sub-paragraph 10.6 of the Doha Ministerial Decision on Implementation-Related Issues and Concerns. The decision provides for annual extensions of the transition period of Article 27.2(b) to the end of 2004, with calendar years 2005 and 2006 constituting the final two year period referred to in Article 27.4.

[330] Specifically, under this provision, any Member deeming it necessary to use export subsidies beyond the eight year transition period (which ended 31 December 2002) that was allowed for non-Annex VII developing Members, had to enter into consultations with the SCM Committee not later than one year before the expiry of that period, i.e. 31 December 2001.

[331] The procedures in G/SCM/39 provide that if a continuation of the extension of the transition period beyond 2007 is either not requested or not granted, the Member in question shall have the final two years referred to in the last sentence of Article 27.4 to phase out the subsidies.

- Third, some decisions were adopted on the basis of Article 27.4 alone. These decisions provided for a one-year extension for the specified programmes, with calendar years 2004 and 2005 constituting the final two-year period referred to in Article 27.4.

Table 40 lists the WTO Members that have been granted extensions pursuant to each of the three categories defined above. It also lists the programmes for which these extensions have been granted. The use of this mechanism is certainly an indication of the importance of S&D provisions to developing countries.

Table 40
Summary of approved extensions of export subsidies

Extensions on the basis of the procedures in G/SCM/39		
Member	**Measure**	**Document**
Antigua and Barbuda	Fiscal Incentive Act Cap 172 (December 1975); Free Trade and Processing Zone Act No. 12 of 1994	G/SCM/50; G/SCM/51
Barbados	Fiscal Incentive Program; Export Allowance; Research & Development Allowance; International Business Incentives; Societies With Restricted Liability	G/SCM/52; G/SCM/53; G/SCM/54; G/SCM/55 G/SCM/56
Belize	Fiscal Incentives Act; Export Processing Zone Act; Commercial Free Zone Act; Conditional Duty Exemptions Facility under Treaty of Chaguaramas	G/SCM/57; G/SCM/58; G/SCM/59; G/SCM/60
Costa Rica	Duty Free Zone Regime; Inward Processing Regime	G/SCM/61; G/SCM/62
Dominica	Fiscal Incentives Program	G/SCM/63
Dominican Republic	Law No. 8-90 to "Promote the Establishment of New Free Zones and Expand Existing Ones"	G/SCM/64
El Salvador	Export Processing Zones and Marketing Act, as amended	G/SCM/65
Fiji	Short-Term Export Profit Deduction; Export Processing Factories/Export Processing Zones Scheme; The Income Tax Act (Film Making and Audio Visual Incentive Amendment Decree 2000)	G/SCM/66; G/SCM/67; G/SCM/68
Grenada	Fiscal Incentives Act No. 41 of 1974; Statutory Rules and Orders No. 37 of 1999; Qualified Enterprises Act No. 18 of 1978	G/SCM/69; G/SCM/70; G/SCM/71
Guatemala	Exemption from Company Tax, Customs Duties and Other Import Taxes for Companies under Special Customs Regimes; Exemption from Company Tax, Customs Duties and Other Import Taxes for the Production Process Relating to Activities of Managers and Users of Free Zones; Exemption from Company Tax, Customs Duties and Other Import Taxes for the Production Process of Commercial and Industrial Enterprises Operating in the Industrial and free Trade Zone	G/SCM/72; G/SCM/73; G/SCM/74
Jamaica	Export Industry Encouragement Act; Jamaica Export Free Zone Act; Foreign Sales Corporation Act; Industrial Incentives (Factory Construction) Act	G/SCM/75; G/SCM/76; G/SCM/77; G/SCM/78
Jordan	Partial or Total Exemption from Income Tax of Profits Generated from Exports under Law No. 57 of 1985, as amended	G/SCM/79
Mauritius	Export Enterprise Scheme; Pioneer Status Enterprise Scheme; Export Promotion; Freeport Scheme	G/SCM/80; G/SCM/81; G/SCM/82; G/SCM/83
Panama	Official Industry Register; Export Processing Zones	G/SCM/84; G/SCM/85
Papua New Guinea	Section 45 of the Income Tax	G/SCM/86
St. Kitts and Nevis	Fiscal Incentives Act No. 17 of 1974	G/SCM/90
St. Lucia	Fiscal Incentives Act No. 15 of 1975; Free Zone Act, No. 10 of 1999; Micro and Small Scale Business Enterprises Act, No. 19 of 1998	G/SCM/87; G/SCM/88; G/SCM/89
St. Vincent and Grenadines	Fiscal Incentives Act No. 5 of 1982, as amended	G/SCM/91
Uruguay	Automotive Industry Export Promotion Regime	G/SCM/92
Extensions on the basis of G/SCM/39 and Paragraph 10.6 of WT/MIN(01)/17		
Member	**Measure**	**Document**
Colombia	Free-Zone Regime; Special Import-Export System for Capital Goods and Spare Parts (SIEX)	G/SCM/93; G/SCM/94
Extensions on the basis of SCM Article 27.4 alone		
Member	**Measure**	**Document**
Barbados	Export Grant and Incentive Scheme; Export Rediscount Facility; Export Credit Insurance Scheme; Export Finance Guarantee Scheme	G/SCM/95; G/SCM/96; G/SCM/97; G/SCM/98
El Salvador	Export Reactivation Law	G/SCM/99
Panama	Tax Credit Certificate	G/SCM/100
Thailand	Industrial Estate Authority of Thailand; Board of Investment Programme	G/SCM/101; /SCM/102

Note: Many of the documents cited in the Table also have relevant addenda attached to them.

As already noted, EPZ-related subsidy measures figure prominently in the approved extensions. The use of export subsidies as a tool for development has long been controversial. Many developing country Members are reluctant to eliminate export-linked investment incentives that they offer via EPZs and other vehicles, both on developmental grounds and because of concerns over investment flight to locations with better incentive packages. A good number of developing countries believe that EPZs have played an important role in their development.[332] There are examples of EPZs which, in the past, have contributed to job creation and income generation in developing countries (Madani, 1999). For this reason alone, developing countries see merit in EPZs even if net exports have often remained low (given that a large portion of inputs is imported), backward linkages limited and investment concentrated in low-tech operations. In certain cases, EPZs did indeed entail positive spillovers owing to demonstration effects of entrepreneurial skills that were copied and transferred to other industries.

Such positive outcomes are not always forthcoming, however. As we have already noted, export subsidies can be significantly distorting, contributing little or nothing to development, and at the same time possibly attracting nullifying remedies by trading partners which turn subsidy outlays into wasted resources. One should also note the risk that if enough countries are pursuing the same subsidization policies, competition among subsidizers can lessen or eliminate any benefits that might otherwise accrue. Hoekman et al. (2004) note that such competition for investment can lead to the transfer of rents to powerful companies that can play governments off against each other. Moreover, subsidy practices may harm poorer countries, which are less able to afford the financial outlays involved.

Although the case for development benefits from export subsidization is mixed, a number of developing countries have advanced S&D proposals in various fora for full flexibility in applying such subsidies, in part with a view to allowing the expansion of export subsidization via EPZ programmes. One argument in support of such proposals is based on the objective of diversification of economic activity. While, as noted above, in certain cases positive spillovers may arise from EPZs, the more general question is whether export subsidies represent the least costly policy measure for this purpose. This is probably not the case. Panagariya (2000) reviews cases in Asia and Latin America where scanty results did not seem to warrant the costs incurred during decades of export subsidization. Conversely, he finds that as soon as trade liberalization and sound macro-economic policies were pursued, good progress on exports was made despite a simultaneous and sharp reduction of export subsidies. He cites Nogues (1989) who reviewed a large number of country experiences and concluded that the diversification of exports towards manufactures occurred when more open import regimes and relative stability in real exchange rates prevailed. In contrast, the provision of export subsidies was not a common element among successful countries. He found that subsidizing countries faced large opportunity costs and an additional waste of resources through rent-seeking activities induced in the private sector.

It is difficult to discount at least some of the empirical evidence against using EPZs as a vehicle for export subsidization. This need not be interpreted as arguing for the elimination of EPZs, but rather for assessing alternative ways to retain the EPZ concept, but ensuring that the instruments and incentives used are supportive of development and consistent with WTO rules. Keck and Low (2004) review some of the issues related to the disciplining the export subsidy aspects of EPZs through the WTO rules and are optimistic about the possibilities available to policy-makers to identify alternative measures less likely to fall foul of WTO rules.

Returning to the SCM Agreement's S&D provisions, it is important to note that although they provide considerable flexibility to developing Members to use subsidies, that flexibility is not unlimited. This is demonstrated by the fact that exemptions provided for in Article 27 have twice been subject to the dispute settlement process. In *Indonesia-Autos* the Panel held that Article 27.3 provided immunity (during a specified transition period) for developing countries from challenges to import substitution subsidies under the SCM Agreement. However, whereas this immunity in respect of import substitution subsidies was unconditionally available to developing country Members, the immunity in respect of export subsidies was subject to additional conditions. In particular, Article 27.4 established development-related conditions for the use of export subsidies and placed a standstill on the level of export subsidies that could be maintained during the specified transition period. In *Brazil-Aircraft* the Panel held that if these conditions were not met, then the Article 3.1(a) prohibition would apply.

[332] See Radelet (1999), which includes references to country case studies in Africa, Asia and Latin America.

This line of reasoning also placed the burden of proof on the complaining party to demonstrate that the conditions were not met. In *Brazil–Aircraft*, Canada (the complaining party) was able to prove that Brazil had not complied with its obligation to refrain from increasing the level of its export subsidies and to phase out its export subsidies by the end of the eight-year transition period. But Canada could not prove that the subsidy programmes were "inconsistent" with Brazil's development needs, and that Brazil thus should have eliminated them in less than eight years. The Panel's recommendations based on these conclusions were subsequently upheld by the Appellate Body. The Panel's language on this issue mirrors much of what was presented in Section D of this Report. In particular, the Panel noted that:

> "There could be any number of reasons why the provision of export subsidies might be consistent with a Member's development needs in such a case. For example, a developing country Member might be interested in the possible technological spin-off effects from the development and production of the product in question, or the need to establish a strong market presence and reputation in foreign markets as a stepping stone to introducing products with greater national value-added." (Panel Report, *Brazil–Aircraft,* para 7.92).

5. SUBSIDIES AND THE DOHA DEVELOPMENT AGENDA

In Doha at the Fourth WTO Ministerial Conference, WTO Ministers agreed to the following mandate for negotiations contained in paragraph 28:

> "In the light of experience and of the increasing application of these instruments by Members, we agree to negotiations aimed at clarifying and improving disciplines under the Agreements on Implementation of Article VI of the GATT 1994 and on Subsidies and Countervailing Measures, while preserving the basic concepts, principles and effectiveness of these Agreements and their instruments and objectives, and taking into account the needs of developing and least-developed participants. In the initial phase of the negotiations, participants will indicate the provisions, including disciplines on trade distorting practices that they seek to clarify and improve in the subsequent phase. In the context of these negotiations, participants shall also aim to clarify and improve WTO disciplines on fisheries subsidies, taking into account the importance of this sector to developing countries. We note that fisheries subsidies are also referred to in paragraph 31."

By January 2006 Members had undertaken three overlapping negotiating processes. First, they indicated in general terms the provisions within these two agreements they thought should be the subject of clarification and improvement in the next phase of negotiations. Second, they submitted and discussed elaborated proposals identifying and explaining in concrete terms the problems that they perceived with the identified provisions, and their suggested approaches to resolving them. Third, they are now in the process of submitting, and considering, specific legal drafting proposals to address the problems that they are seeking to solve.

The latest report of the Chair of the Negotiating Group on Rules on 30 November 2005 highlighted the relatively slow pace of negotiations on horizontal subsidies issues compared to the negotiations on anti-dumping and countervailing measures. As of that date, only four out of a total of 55 proposals to the Group addressed the horizontal subsidy rules. Since that time, some additional proposals have been submitted and the issues identified for possible negotiation include aspects of the definition of a subsidy, specificity, prohibited subsidies, serious prejudice, export credits and guarantees and the allocation of benefits, and special and differential treatment.

The thrust of SCM-related proposals made in the negotiations is similar to much of the argumentation in this Report – striking the right balance between strong disciplines on trade distortive subsidies and flexibility to use subsidies to achieve national objectives in the face of market failures. Some Members consider that the disciplines in the SCM Agreement should be strengthened to make it more difficult for national governments to use subsidies. Other Members, especially developing country Members, argue for more flexibility to use subsidies.

The provisions relating to prohibited subsidies, and to certain aspects of countervailing methodology, are the topics that have attracted the most attention to date. In the area of prohibited subsidies, one issue is whether or not to extend the list and if so, to which instruments. The United States has argued that such an expansion would be "an obvious next step in the deepening of subsidy disciplines".[333] The EU argued that consideration should be given to clarifying SCM Article 3.1(b) on local content subsidies, especially with regards to "value added" programmes. Australia and Brazil have raised issues with regard to the interpretation of a *de facto* export contingency,[334] and Brazil with respect to the treatment of export credits and guarantees.[335] One concern in this regard is to ensure that the export propensity of a subsidy recipient should not be the sole or a determining factor in whether or not a subsidy is contingent on exporting.[336] On countervail, the proposals relate to pass-through of benefits,[337] and certain procedural and methodological issues.[338]

There are some proposals that lament the expiration of Article 6.1 on "Serious Prejudice". Views differ, however, as to where the various provisions contained in that Article should be placed if reinstated in the SCM Agreement. One view is that the listed subsidies should be prohibited outright on the grounds that they are already recognized as highly trade-distortive. Another view is that the provisions should be reinstated more or less as they were, including the rebuttable presumption of serious prejudice.[339]

Special and differential treatment proposals relating to the Rules negotiations relate to Articles 3.1, 27.1, 27.3, 27.4, 27.8, 27.9, 27.13 and 27.15.[340] The overall gist of these proposals is to allow developing countries more room to use subsidies. For example, a proposal to change SCM Article 27.4 seeks to remove the time frame for seeking an extension to use export subsidies and raise the threshold for having to eliminate them.

Finally, the specific negotiating mandate on fisheries subsidies in Paragraph 28 of the Doha Ministerial Declaration recognizes that uniform disciplines on all subsidies may not work in relation to the specific problems associated with the fisheries industry. According to a report of the Chair of the Negotiating Group, work on developing disciplines in the area continues to progress at a slow pace. The Chair has also reported that there seems to be broad agreement among negotiators that disciplines on subsidies in the fisheries sector should be strengthened, including through the prohibition of certain forms of fisheries subsidies that contribute to overcapacity and over-fishing, and that any new disciplines should include appropriate and effective special and differential treatment provisions.[341] It nevertheless seems clear that moving from such a broad agreement to more precise and detailed text on the scope of new disciplines will not be easy. Among the complexities are the degree of uniqueness that should be assigned to fisheries subsidies, especially in the context of "adverse effects", and whether or not the definition and interpretation of this concept needs to be broadened.

333 WTO document TN/RL/W/78.

334 WTO document TN/RL/W/30.

335 WTO document TN/RL/W/86.

336 WTO document TN/RL/GEN/34.

337 WTO document TN/RL/GEN/86.

338 WTO documents N/RL/GEN/93, TN/RL/GEN/96, TN/RL/GEN/45.

339 WTO document TN/RL/GEN/14.

340 See 20-21 of WTO document TN/CTD/W/3/Rev.2.

341 WTO document TN/RL/15.

6. SUMMARY

The subsidy-related agreements of the WTO try to strike a balance between justified subsidy intervention to meet national objectives and to offset various market failures, and the trade distortive potential of subsidies. Views differ as to whether or not the correct balance has been struck. To some the disciplines may have gone too far and constitute too great a handicap for national governments, especially those of developing countries. To others, the various attempts to account for different circumstances in which subsidy policies are applied has created a porous set of rules without any significant bite. This debate will continue both within the context of the current round of negotiations and in academic circles.

One thing, however, is certain. The subsidy provisions of the WTO agreements have done much to increase the transparency of subsidy policies and their impact on international trade flows. Notification requirements, when adhered to, provide a window on the operation and impact of subsidies policies. The rules have also brought greater predictability and stability to subsidy policies.

As with all WTO Agreements a key criterion in determining the overall contribution of the subsidy rules is the extent to which they allow developing countries the opportunity to meet their national objectives. We have argued here that continued pressure by some developing countries for extensions of the right to subsidize manufactures might be looked at in terms of broader questions about the potential development contribution of certain subsidy practices, particularly perhaps those that are less firm-specific and more infrastructure-oriented. If this were to be done, it would need to be against very strong cautions about the dangers of destructive subsidization. Governments would need to confront the real risk that subsidy policies may be espoused which contribute nothing to development, and may even compromise development opportunities.

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TECHNICAL NOTES

1. COMPOSITION OF GEOGRAPHICAL AND OTHER GROUPS

(a) Regions

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

South and Central America and the Caribbean: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and other countries and territories in South and Central America and the Caribbean, n.e.s.

Europe: of which European Union (25): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovenia and Slovak Republic and Other Europe, of which Other Western Europe: Iceland, Norway, Switzerland and Liechtenstein, and Western Europe n.e.s.; and Other South-Eastern Europe: Albania, Bosnia and Herzegovina, Bulgaria, Romania, Croatia, former Yugoslav Republic of Macedonia, Serbia, Montenegro, and Turkey; and territories in Europe n.e.s.

The Commonwealth of Independent States (CIS): Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

Africa, of which *North Africa*: Algeria, Egypt, Libyan Arab Jamahiriya, Morocco and Tunisia; and *Sub-Saharan Africa* comprising: *Western Africa*: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo; *Central Africa*: Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Rwanda, and Sao Tome and Principe; *Eastern Africa*: Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Seychelles, Somalia, Sudan, United Republic of Tanzania and Uganda; and *Southern Africa*: Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe; and territories in Africa n.e.s.

The Middle East: Bahrain, 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, of which *West Asia*: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka; and *East Asia (including Oceania)*: Australia; Brunei Darussalam; Cambodia; China; Fiji; Hong Kong Special Administrative Region of China (Hong Kong, China); Indonesia; Japan; Kiribati; Lao People's Democratic Republic; Macao, China; Malaysia; Mongolia; Myanmar; New Zealand; Papua New Guinea; Philippines; Republic of Korea; Samoa; Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu (Taipei, Chinese); Singapore; Solomon Islands; Thailand; Tonga; Tuvalu; Vanuatu; Viet Nam, and other countries and territories in Asia and the Pacific n.e.s.

(b) Regional integration agreements

Andean Community: Bolivarian Republic of Venezuela, Bolivia, Colombia, Ecuador and Peru.

ASEAN/AFTA: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

CACM: Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

CARICOM: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

COMESA: Angola, Burundi, Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

ECCAS: Angola, Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Rwanda and Sao Tome and Principe.

ECOWAS: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

EFTA: Iceland, Liechtenstein, Norway and Switzerland.

EU (25): Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovenia, Slovak Republic, Spain, Sweden and the United Kingdom.

GCC: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

MERCOSUR: Argentina, Brazil, Paraguay and Uruguay.

NAFTA: Canada, Mexico and the United States of America.

SAARC/SAPTA: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

SADC: Angola, Botswana, Democratic Republic of the Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

(c) Other groups

ACP: Angola, Antigua and Barbuda, Bahamas, Barbados, Belize, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the Congo, Cook Islands, Côte d'Ivoire, Cuba, Djibouti, Dominica, Dominican Republic, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Ghana, Grenada, Guinea, Guinea-Bissau, Guyana, Haiti, Jamaica, Kenya, Kiribati, Lesotho, Liberia, Madagascar, Malawi, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia, Mozambique, Namibia, Nauru, Niger, Nigeria, Niue, Palau, Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Africa, Sudan, Suriname, Swaziland, Timor Leste, Togo, Tonga, Trinidad and Tobago, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Zambia and Zimbabwe.

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

Six East Asian traders: Hong Kong, China; Malaysia; Republic of Korea; Singapore; Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu (Taipei, Chinese) and Thailand.

WTO Members are frequently referred to as "country", although some Members are not countries in the usual sense of the word but are officially "customs territories". The definition of geographical and other groupings in this report does not imply an expression of opinion by the Secretariat concerning the status of any country or territory, the delimitation of its frontiers, nor on the rights and obligations of any WTO Member in respect of WTO Agreements. The colours, boundaries, denominations, and classifications in the maps of this publication do not imply, on the part of the WTO, any judgement on the legal or other status of any territory, or any endorsement or acceptance of any boundary.

Throughout this report, South and Central America and the Caribbean is referred to South and Central America; the Bolivarian Republic of Venezuela, the Republic of Korea and the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu are referenced as Bolivarian Rep. of Venezuela; Korea, Republic of and Taipei, Chinese respectively.