OECD DEVELOPMENT CENTRE

POLICY BRIEF No. 5

TRADE LIBERALISATION: WHAT'S AT STAKE?

by

Ian Goldin and Dominique van der Mensbrugghe

Second edition

- Trade barriers seriously distort patterns of international trade, allocation of resources, and economic growth. The total economic costs of the barriers are estimated to exceed $475 billion per annum
- Partial reform, such as envisaged in the Uruguay Round, would yield benefits of $195 billion per annum, of which over $90 billion would accrue to developing and formerly centrally planned countries
- The EC, Japan, and EFTA, stand to gain most from liberalisation
- Trade liberalisation will raise rural incomes in developing countries

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In its research activities, the Development Centre aims to identifiy and analyse problems whose implications will be of concern in the near future to both Member and non-member countries of the OECD. The conclusions represent a contribution to the search for policies to deal with the issues involved.

The Policy Briefs *deliver the research findings in a concise and accessible way. This series, with its wide, targeted and rapid distribution, is specifically intended for policy and decision makers in the fields concerned.*

This Policy Brief *draws on the Development Centre's research on the implications of trade liberalisation for developing countries. It provides insights into the issues at stake in the Uruguay Round, focusing on the pivotal agricultural negotiations. The countries with the greatest levels of protectionism, notably Japan, the EC, and EFTA, stand to gain most from liberalisation. Despite gains for most developing countries, some of them stand to lose as a result of liberalisation. Their legitimate concerns need to be addressed in order to ensure that the gains arising from liberalisation and from a levelling of the economic playing field accrue to those who are most threatened by existing policies — poor people in poor countries. Quantitative analysis shows that partial liberalisation, involving a reduction in protectionism of around 30 per cent, would lead to annual income gains of $195 billion, greater than the total income of sub-Saharan Africa or roughly half the income of China. Of this total, over $90 billion — more than twice the current level of official development assistance — would accrue to the developing countries. The total annual costs of trade distortions are estimated to be over $475 billion, or roughly 50 per cent of the income of the less-developed economies representing a population of 3 billion people.*

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1. Introduction[1]

The contrast between trade liberalisation theory and practice in the industrialised countries is increasingly stark. Whereas OECD Member countries unanimously endorse liberalisation as an economic ideology, their trade practices point in the opposite direction. Formerly centrally planned economies and developing countries, who in the past have been seen as more protectionist, have been making major reform efforts. Their remarkable courage in undertaking economic adjustments are now threatened by the failure of the industrialised countries to undertake reciprocal measures. Since the Uruguay Round was launched in 1986, over 60 developing and former centrally planned countries have unilaterally liberalised their trade, but only 12 industrialised nations have responded similarly[2].

The Uruguay Round of Multilateral Trade Negotiations is a long way from its September 1986 Punta del Este declaration "to halt and reverse protectionism and to remove distortions to trade"[3]. Initial optimism that it could overcome the hurdles which for six years bogged down the less ambitious Tokyo Round has evaporated. The widening of the scope and depth of the negotiations and the active participation of 108 member countries has meant that the Uruguay Round is the most complex multilateral negotiation ever attempted. Its success would crown the end of the Cold War with a commitment to global economic integration. Its failure would presage growing economic and political conflict.

The industrialised countries are expected to gain most from a liberalisation agreement, because their economies are currently most distorted by protectionism. However, from a development and poverty alleviation perspective, the former centrally planned and developing countries stand to suffer most from a failure of the Round.

2. The GATT

The General Agreement on Tariffs and Trade (GATT) is the basis for a global rule-based trading system. Members agree to treat others equally and to reduce barriers to trade. The tariff concessions are linked to *non-discrimination* through the principle of *most-favoured nation* (MFN) treatment. Through tariff concessions, contracting countries reduce the tariffs imposed on imports from other GATT signatories, while the MFN rule obliges contracting states to extend to other GATT signatories the most favourable trade treatment accorded to an individual country[4]. These non-discriminatory rules are critical to the developing and formerly centrally planned countries whose future growth depends on access to industrialised markets[5]. The non-discrimination policies which are at the heart of the GATT, provide a basis for equal treatment with well established traders. Meanwhile, the multilateral nature of the GATT, including its disputes procedures, prevents large countries exerting undue pressure on smaller ones; the latter can and do use the rules to win equal status with larger ones.

Tariff concessions have been periodically negotiated among contracting parties through a series of Rounds conducted under the auspices of the GATT. The Uruguay Round is the eighth since the General Agreement came into being. The latest negotiations include sectors so far largely or completely excluded, such as services, intellectual property and agriculture.

The Uruguay Round is taking place in a difficult economic and political environment. Many participants, both developed and developing, face a slowdown in growth, rising unemployment, and large domestic and/or international debts. Moreover, in many countries, excess capacity in traditional industries, and intense competitive pressures in these and more modern sectors, such as electronics, from emerging industrial competitors, has provided an impetus for strengthening protectionism. Politically, governments in the industrialised countries appear insecure, with the governing parties or coalitions vulnerable to small swings in support. Meanwhile, the democratic tide sweeping developing and formerly centrally planned economies has meant that competing political claims have imposed added constraints on their ability to negotiate.

Against the background of growing protectionism and politicisation, it is not surprising that, while the previous seven Rounds concentrated on tariff structures for industrial products, the Uruguay Round has also devoted attention to domestic subsidies for agriculture, non-tariff barriers, services, textiles, trade-related investment measures (TRIMs) and trade-related intellectual property rights (TRIPs). Whereas developing countries have much, and perhaps even most, to gain from the discussions on services, TRIPs, TRIMs, and textiles, the discussions concerning agriculture have occupied the centre stage[6]. They have also proved to be the major sticking point and source of friction among the industrialised countries.

3. The Uruguay Round and Agriculture

Successive GATT Rounds have treated agriculture as an exception and it has not been subject to the same disciplines as industrial products. It is ironic that while the United States now insists on the inclusion of agriculture, its special treatment from the outset reflected the post-World War Two demands of the United States Senate for a New Deal by which US domestic agricultural policy would have primacy over international treaty obligations. Despite the heightening of trade frictions, as reflected in the "chicken war" of 1960-61[7], the Dillon Round (1961-1962) failed to address agricultural issues. By the time of the Kennedy Round (1963-1967), the United States regarded the emerging European Community (EC) Common Agricultural Policy (CAP) as a major threat. The current conflict over the CAP was fully rehearsed at that time, with the EC willing to countenance industrial but not agricultural trade liberalisation. The Tokyo Round (1973-1979) represented an intensification of the skirmishes of the Kennedy Round, but the transatlantic conflict continued to be fought through limited bilateral accommodations.

Against a backdrop of growing trade friction, accentuated by balance of trade pressures within the United States, and growing budgetary pressures within the EC, and in light of the constellation of major leaders — Reagan, Thatcher, Kohl and Chirac — committed to economic liberalism, pressure mounted for the ending of agriculture's exceptional treatment

in the Uruguay Round[8]. Between the 1982 GATT Ministerial Round and the final signing of the Punta del Este Declaration in November 1986 agriculture remained the major source of contention, with the dispute focusing then as now on the transatlantic conflict between the European Community and the United States.

The broadening of the GATT Contracting Parties' ambitions in the Uruguay Round may be understood in the context of the growing international concerns regarding the adverse effects of existing trade practices[9]. In agriculture, rising protectionism in the EC, United States and Japan, has seen a growing juxtaposition between falling world prices and high and rising domestic prices, implying both an increase in costs to consumers and a rise in public expenditures on agricultural subsidies. These and other problems convinced the GATT's contracting countries of the need to "bring more discipline and predictability to world agricultural trade by correcting and preventing restrictions and distortions including those related to structural surpluses so as to reduce the uncertainty, imbalances, and instability in world agricultural markets"[10].

The instability is partly due to increasing domestic subsidies and unfair trade practices. During the 1980s, industrial countries have strongly increased subsidies to agriculture[11] while agricultural trade has been increasingly regulated by bilateral agreements and market-sharing provisions. Moreover, the growing use of non-tariff barriers (NTBs) has reduced the effectiveness of negotiated tariff reductions. Since the end of the Tokyo Round in 1979, the average level of industrial tariffs in developed countries has fallen by nearly half to 6.4 per cent. The value of total world merchandise trade has grown by a remarkable 4.8 per cent per year. This growth is mainly confined to the industrialised countries; in the 1980s, developing countries' exports grew by only 1.6 per cent, and their share of world trade fell from 28 to 21 per cent[12].

In part, the explanation for these trends is to be found in the protectionist policies of developed countries, but developing countries have also discriminated against their own agriculture. In the latter, the situation tends to be the mirror image of that in the richer countries, with distortionary policies used to discriminate against, rather than in favour of agriculture. Many developing countries followed "infant industry" policies in order to promote industrialisation by protecting manufacturing from competitive imports, and taxed agricultural producers. In part, this penalisation has occurred through "direct" taxation of agriculture, through tariffs and other means, but, as Figure 1 shows, "indirect" taxation, from overvaluation of exchange rates and other macroeconomic distortions has also served to penalise agriculture[13].

4. The Implications of an Agreement: A Quantitative Analysis

In order to assess the implications of trade reform on production, consumption and trade, it has proven useful to develop a formal framework which can trace through the implications of policy reform in a consistent manner. Accordingly, the OECD Development Centre, in association with the World Bank, has developed a model of global production and trade. The model is known as the Rural/Urban-North/South Model, or RUNS. A summary of the model is provided in the Annex.

A) The Scenarios

All the reform scenarios will be compared with a base (or benchmark) simulation. The base simulation replicates the key economic aggregates for the observable period, 1985-1990, and then projects forward to the year 2002. There are many assumptions that go into these projections, including the levels of the policy instruments (assumed to be held constant at their 1990 base levels), productivity trends (both in agriculture and the rest of the economy), population growth rates, and foreign capital flows. Given these fixed (or *exogenous*) elements, the base simulation projects each region's GDP, income, supply, demand, and trade to the year 2002. It also projects world commodity prices. Any change in the fixed assumptions, such as a change in productivity trends, leads to a change in the base simulation. Reform is simulated by changing government policies. The new projections, under the reform scenario, are then compared with the base simulation.

The proposals for trade reform under discussion at the Uruguay Round are very intricate. They involve trade reform measures of well-defined commodities and specific measures to be taken for each commodity and country. Despite its complexity, a model such as RUNS is not able to provide more than a general picture of the effects of reform. The scenario chosen for the purposes of this policy brief is a 30 per cent reduction in all border measures, both in agriculture and non-agriculture, as well as a 30 per cent reduction in agricultural input subsidies. These reductions may not fully represent the final agreement. However, we believe they are a close approximation to the current negotiating positions, including the December 1991 draft Final Act of the Uruguay Round of Multilateral Trade Negotiations, and are indicative of a possible compromise. The full 30 per cent reduction is applied in 1993 and is maintained at that level for the remainder of the period analysed, i.e. through 2002.

The results of a second simulation are also presented. This simulation models the global economy assuming full removal of all distortions. This provides an indication of the maximum potential gains from reform, against which the partial reform scenario may be compared.

B) The Results

Partial Reform

The distribution of the winners and losers from policy reform will depend on three factors: the levels of the original trade distortions, the relative trade position of individual regions, and changes in world prices.

Prices. As shown in Table 1 under the partial reform scenario, world prices for many commodities increase; including those of meats, coarse grains, vegetable oils, sugar, and dairy products. There are, however, several notable exceptions. The world price of wheat is virtually unchanged, and the price of rice, coffee, and cocoa decreases. In the industrialised countries, farmers face lower wheat prices which leads to a reduction in output, but this is more than compensated by increased production in other regions where

the producer price increases. In rice, this is amplified, as some of the main rice producers of rice heavily tax their producers. Finally, the world prices of coffee and cocoa decrease significantly, as the producers of these products are also taxed, and they respond positively to an increase in the producer price.

Welfare. The numbers in Table 2 provide an indication of the gains in income attributed to the different reform scenarios[14]. Under the 30 per cent partial liberalisation scenario, almost all of the RUNS regions gain in total income. The largest gains occur in the regions with the largest agricultural distortions, ASEAN and other Asia, Japan, the EC, and the European Free Trade Area (EFTA) countries[15].

There are some notable losers, particularly amongst the poorest regions, such as sub-Saharan Africa. The losers can be broadly classified as net food-importers. They suffer from significant deterioration in the terms of trade. They tend to import food commodities which are increasing in price, and to export food commodities which are decreasing in price: rice, coffee, cocoa, and to some extent fruits. Several also rely on significant petroleum exports. The price of petroleum is linked to the price of OECD manufacturing exports which decline in relative terms.[16] This aggravates the deterioration in the terms of trade.

Potential losses to sub-Saharan Africa, and other food importers should not be minimised, and the potential negative impact on food security must be kept in mind. However, it should be stressed that the losses are small in absolute value. Given the overwhelming gains, particularly within the OECD countries, the losers could be compensated. For example, the global income gain in the year 2002 is $195 billion (evaluated in 1992 dollars), of which about *$104 billion* accrues to OECD regions and around $91 billion to the developing regions. A number of developing countries lose, but the total $7 billion in losses is small compared to the gains, and could be compensated for by a transfer of 3.5 per cent of the gains, equivalent to less than 20 per cent of official development assistance.

Agricultural Production. Under the base scenario, world production of grains is assumed to grow by 3.0 per cent per annum (i.e. an increase of world production of 34 per cent in the year 2002, compared to the 1992 levels of production). Under the partial liberalisation scenario, world production of grains decreases slightly compared to the base simulation levels. The annual growth rate drops to 2.95 per cent, implying only a small change in production in 2002, as compared to the base simulation. The decrease in grain production in the protected OECD countries, is not fully compensated by an increase in production in the non-protected or taxed regions. The decrease in the growth rate of production does not imply a decrease in household consumption, which in fact increases for most commodities. It is intermediate consumption of feed grains in the livestock sector which decreases due to the rise in feed grain prices. This leads to a substitution away from feed grains to more range-fed cattle, and substitution of production to regions with more (and cheaper) land.

The structure of production changes significantly, allowing each region's comparative advantage to take precedence over artificial barriers. For example in the world wheat market, the EC's total share in production decreases from 12.5 per cent to 11.8 per cent. Contrary to the beliefs of some observers, this gap will not necessarily be filled by US farmers, since their share of global wheat production decreases from 7.7 per cent to 7.0 per cent. The larger gains in share occur in Latin America, and the former Soviet Union, as well as in Low Income Asia and Africa. In coarse grains, the story is similar, with the EC's share

decreasing from 10.7 per cent to 10.4 per cent, and the US share decreasing from 23.3 per cent to 23.1 per cent. Latin America, India, the former Soviet Union, and sub-Saharan Africa all increase their shares of world production. Note again that the decline of production in the EC, for example, is relative to the base simulation levels, there is no absolute decline in production between now and 2002.

Structural Re-Allocation. The reform process will induce structural changes in virtually all regions. The largest changes occur in the OECD countries with an aggregate drop in real rural GDP of 7 per cent, and an increase in real urban GDP of 0.3 per cent. While the drop in rural GDP is not insignificant, its share in total GDP is less than 10 per cent, and the rise in urban GDP is sufficient to make total GDP increase. Similar shifts occur in both Upper Income Asia and the Gulf Region. Both of these two regions are quite similar to the OECD regions with relatively high incomes, and relatively high and *increasing* levels of agricultural protection.

Shifts in the other regions are less pronounced and do not lead to easy generalisations. A comparison of Low Income Asia and India is revealing. Both regions have relatively high rates of nominal protection on non-agricultural commodities (ranging from 50-100 per cent). India has a mixed strategy with respect to agricultural protection. It subsidises both its producers (via direct input subsidies), and its consumers (via subsidised imports). Low Income Asia on the other hand has low subsidies and low border measures. The reduction of protection in India leads to an improvement in the rural sector compared to the urban sector. The rise in domestic farm prices outweigh the effects of a reduction in input subsidies, and rural incomes increase quicker than urban incomes. In Low Income Asia, urban tariffs are relatively more important than agricultural protection. While the reduction in tariffs increases competitive pressures domestically, it also reduces the costs of intermediate goods. Moreover, the dynamic effects tend to be more pronounced in Low Income Asia than in India. Due to the structure of its exports and imports, India suffers almost no change in its terms of trade while Low Income Asia sees a 1.6 per cent drop. In order to maintain a constant balance of trade this requires a drop in the real exchange rate in Low Income Asia. The combination of the drop in the real exchange rate and the lowering of tariffs, decreases the cost of capital goods in Low Income Asia. With an almost constant level of savings, the increase in real investment is significant, and leads to a rise in long term growth in the urban sector. While the cost of capital goods decreases in India, the reduction is not as significant.

Complete Liberalisation

The following paragraphs describe the results of simulating full liberalisation, in other words, the complete removal of all trade distortions and production subsidies, for all commodities, and in all regions.

Prices. There are significant shifts in world agricultural prices. Grain prices increase between 7 per cent and 14 per cent, and meat and dairy prices rise by 25 per cent to 45 per cent. As with the partial liberalisation scenario, the prices of rice and tropical beverages decline. Rice declines in price by 7 per cent, and tree crop prices fall by 17-18 per cent. This will clearly aggravate the terms of trade deterioration in sub-Saharan Africa and several other regions.

Welfare. Full liberalisation tends to amplify the income effects of partial liberalisation. With two exceptions, there is no reversal in the signs of the income gains; previous gainers gain more, and all previous losers, lose more. The two exceptions are the Gulf Region and Canada. In both cases, the losses in the rural sector are amplified significantly, while there are smaller relative gains in the urban sector.

The total gains in the year 2002 measure *$477* billion (in 1992 prices) of which $256 billion accrues to the OECD Member Countries and the remaining $221 billion to developing and formerly centrally planned countries. As in the case of partial liberalisation, a number of mainly developing country regions lose, and total losses amount to $44 billion. While the size of the losses is greater than in the case of partial liberalisation, so too are the gains, and consequently the scope for possible compensation.

Agricultural Production. As in the case of partial liberalisation, full liberalisation results in a modest deceleration in production growth. This leads to less output in the year 2002 as compared to the base simulation levels. Again, this does not indicate a reduction in household consumption, but rather a fall in intermediate feed consumption in the livestock sector. As land prices fall, there is a shift to more range-fed production of meat, rather than ranch-fed.

The structure of global production in grains shifts even more significantly to the former Soviet Union, Latin America, Asia, and sub-Saharan Africa, than under the partial liberalisation scenario. This reinforces the fact that agricultural trade liberalisation should not be perceived principally as a restructuring of agricultural trade within the OECD countries, but as a restructuring of trade between the OECD countries and the rest of the world.

Structural Re-Allocation. Real rural GDP could drop by as much as 21 per cent under full liberalisation, as compared to the base simulation level, within the OECD regions, however, this would be more than offset by a rise of 1 per cent in urban GDP. In other regions, the structural change is not uniform. The countries with the largest improvement in rural GDP include Low Income Asia, China, India, sub-Saharan Africa, the Maghreb, and Latin America. The largest increases in urban GDP will occur in Low and Upper Income Asia, and the Gulf region. In most of the non-OECD countries, rural incomes increase more than urban incomes, alleviating poverty which tends to be concentrated in the rural areas, and alleviating rural to urban migration and urban population pressures.

Summary. The current levels of agricultural and non-agricultural protection are costly both to the OECD countries and to the non-OECD countries. The overall gains from liberalisation greatly exceed the losses. However, the potential losses facing low-income countries require an enhanced commitment to compensation and development assistance.

Within regions, there also will be winners and losers. In a number of OECD regions, the growth in rural per capita incomes and production will slow under trade reform, but even under full liberalisation rural incomes in these regions will be higher at the end of the period than currently. Existing policies, we stress below, have been very uneven and inefficient in improving rural incomes. Much of the effect of agricultural policies has been to increase land prices and benefits large farms more than small farms. As noted in the concluding remarks, the programmes have not been successful as an income support measure. More narrowly targeted programmes can be devised which are less costly and more effective.

In virtually all of the developing countries, the rural populations reap significant gains from liberalisation. To the extent that poverty is more concentrated in the rural sectors, this should lead to a large reduction in income inequality and in poverty alleviation.

Trade liberalisation will lead to a significant restructuring of production, not only within the OECD region, but also between the OECD countries and the non-OECD countries. This globalisation of production and trade should lead to more stable global production and a decrease in the variability of world agricultural prices.

The overall gains in terms of increasing world income range from $195 billion per annum in the case of a partial reform, to $477 billion per annum in the case of complete liberalisation. While there are regions which lose from reform, the overall gains are significantly larger than the losses, so that compensation mechanisms can be implemented which could ensure that all regions gain from trade reform.

5. Instability, Stocks, Food Aid and Food Importers

Whereas border and other interventions may well have served to reduce the price instability faced by individual farmers and consumers, these same protectionist policies have served to increase instability in world markets. The effects have been particularly devastating for poorer consumers and producers whose governments are unable to provide insulation from the global markets in the longer term. Farmers' income and consumers' food security in developing countries have thus fluctuated over a wider range, forcing them to adopt risk-averse strategies in which savings are higher and investment lower than might be anticipated in a world of more stable prices. For governments, the effects have been equally severe; sharp variations in the revenues derived from agricultural exports or the costs of food imports have destabilised economic policy and undermined investment[17].

Price instability on world markets cannot be attributed solely to protectionist policies. In agriculture, climatic variations and speculative activities on the part of large traders and stockholders are also important. Nevertheless, it may be expected that wider and more equal participation in markets will narrow the range of these activities. In the first place, the distribution of production more widely will ensure more players in the market, which in itself suggests more stability[18], especially as production will be distributed over a wider climatic range, with southern and eastern hemisphere producers increasing their market shares. Greater participation and more transparency is expected to reduce speculation and lower transaction costs.

Those who argue that existing protectionist policies contribute to food security point to the possible role of high stock levels in meeting emergency demands, such as may arise from climatic disasters. It should be noted however that strategic stocks can be accommodated within free markets through hedging operations, or through non-distortionary international accords, such as might be managed through multilateral institutions like the World Food Programme. Stockpiles which exist as a result of protection for industrialised farmers cannot be justified on the basis of their potential use in overcoming instability. The link between these stockpiles and the willingness of industrialised donors to grant food aid is, however, a matter of concern, because circumstantial evidence suggests that food aid has been seen as a politically acceptable means of disposing of food mountains.

The long running debate concerning the effectiveness of food aid has highlighted concerns regarding its possible negative implications for farmer incentives in the recipient countries. Whereas food aid provides a vital function in reducing famine, the long run solution to food security lies in improving domestic incomes and food supplies. This calls for policies, including trade policies which promote developing country growth, and particularly the position of farmers in the deficit countries. Food aid is a necessary short term response to famine, but to avert dependence, longer term policies for sustainable development are necessary. These include reductions in protectionism, facilitating the competitive position of the developing countries. Industrialised countries should play a greater role in averting starvation by purchases of grains on international and neighbouring markets, lowering transport costs and improving incentives for farmers. Linking food aid to farm subsidies in industrialised countries may be politically convenient, but it is not a solution for the world's hungry people.

Food importers, as we show above, stand to lose the most from the higher world prices which are expected to result from a successful resolution of the Uruguay Round[19]. These countries have nevertheless remained resolute in their support for the Round, concentrating their efforts on securing concessions which will insulate their consumers from the possible negative consequences of higher prices. The Net Food Importers' Group[20] have requested special treatment to alleviate the burden of increased prices on the balance of payments position of food-importing countries and assistance in enhancing the productive capacity of their own farmers. Their legitimate fears should be recognised and appropriate mechanisms be developed to alleviate the temporary hardships resulting from liberalisation. In particular, the potential for the International Monetary Fund's Compensatory and Contingency Financing Facility to provide balance of payments support, the World Bank to provide other financial assistance and the World Food Programme's assistance programme to co-ordinate direct food aid, should be examined as possible elements in a package to deal with possible adverse effects of liberalisation on vulnerable developing countries.

It is noteworthy that while both the wealthiest and the poorest participants in the Uruguay Round tend to be food importers, it is the wealthiest countries, who cannot conceivably suffer a risk of famine, who have shielded themselves from liberalisation and defended protectionism behind food security arguments. Developing country food importers, who are most threatened by higher prices, have in contrast embraced the Round and supported its speedy resolution. Their concern has been to ensure a comprehensive outcome, so that their potential losses in terms of their food import bills are compensated for by gains in other areas, for example in textiles[21]. This attitude, we show below, is indicative of the wider shift in developing countries' views on trade liberalisation and the possibilities offered by the GATT.

6. Trade and the Environment

Growing concern regarding the environment has introduced new issues in the trade debate[22]. It is necessary to consider the effects of trade policies on the environment, and environmental policies on trade. Arguments have been made suggesting that whichever the starting point, protection of the environment is incompatible with liberalisation. In the first case, it is suggested that trade liberalisation, by expanding production and accelerating

growth, inevitably has a negative effect on the environment. Secondly, domestic pressures to protect the environment and increasing discrimination against trade in products which are seen to be produced at a lower environmental threshold, are likely to be associated with a heightening of non-tariff barriers and "green" conditionalities on trade.

The association of trade liberalisation with environmental degradation is, however, misplaced, and is likely to prove counterproductive not only to economic welfare but also to the environment. The key is to ensure that countries implement policies which improve the environment and that the benefits of trade liberalisation accrue through the development of comparative advantages based on environmentally appropriate patterns of production. In industrialised countries, producers have allied with the increasing powerful environmental lobbies to frustrate liberalisation. This has negative implications for developing countries, as their environmental problems are essentially poverty related; the eradication of poverty is facilitated by growth and access to industrialised markets.

For the industrialised countries, the distortions in domestic resource use resulting from protectionism may also have negative environmental implications. This is particularly notable in agriculture, where, for example, the combination of set-asides and subsidies have served to raise land prices and encourage excessive chemical application. In the EC, for example, this has already had disastrous consequences for the quality of water; agriculture is a greater polluter of water than industry, despite the fact that it accounts for less than one tenth of the economic activity[23].

The environment is a critical concern at the local, national and international levels. Trade policies, like any other economic policies, can have environmental implications. Trade policies, *per se* are not a direct cause of environmental problems. The resolution of environmental problems rests on the development of effective *environmental* policies. For developing countries and formerly centrally planned economies, environmental problems tend to be the result of domestic policy failures and/or poverty related factors. Their resolution demands the development of appropriate environmental policies and growth, which is facilitated by trade, as well as international assistance. For industrialised countries, protectionism, as much as liberalisation, may be associated with environmental degradation. Trade instruments are an extremely blunt tool with which to tackle environmental issues, but trade liberalisation does provide the economic base upon which sustainable environmental policies may be constructed.

7. The Negotiations and Developing Countries

At the heart of the GATT, is the principle of non-discrimination, by which all signatory countries commit themselves to provide all other members with Most Favoured Nation (MFN) treatment. Nevertheless, an increasing share of international trade in agricultural products has been conducted on a discriminatory basis. Moreover, in recent years there has been a growing use of non tariff barriers (NTBs)[24] with these increasingly taking the place of border tariffs. Some 18 per cent of the manufactured imports and 38 per cent of agricultural imports are currently subject to NTBs[25].

In the developed countries NTBs protect domestic producers and processors through a wide assortment of policies restricting trade. Trade is limited directly by quantitative restrictions such as import quotas and voluntary export restraints, while variable levies, minimum entry prices and technical standards have an indirect effect on the volume and price of imports. In developing and formerly centrally planned countries, tariffs in the past were combined with import quotas and foreign-exchange rationing to insulate the domestic economy.

Developing countries' particular problems had been acknowledged by signatory countries to the GATT since the mid-1950s. Thanks to the "Special and Differential treatment", exports from developing to developed countries under the Generalized System of Preferences (GSP) have been free from the MFN obligation in GATT membership. Under the GATT rules, LDCs have been allowed preferential access to developed countries' markets while keeping their own markets relatively closed.

Despite this "special" dispensation, developing countries have in practice been most exposed to discriminatory export restraint agreements and other trade distorting measures, with the incidence of this discrimination falling heaviest precisely in those sectors in which they have a comparative advantage, such as agriculture, and textiles. Increasingly, it is developing countries which have engaged in liberalisation, and who are required to liberalise their trade before applying for GATT membership. In this sense, it is the developed, not the developing countries who enjoy exceptional treatment.

The exemption accorded to developing countries from reciprocity, as well as the effective exclusion from earlier negotiations of agricultural products[26], has meant that until the current Round developing countries have tended to be on the sidelines of the GATT. They have tended to concentrate attention on the most favoured nation (MFN) prerogatives as GATT signatories, rather than on multilateral bargaining, and on bilateral concessions granted by major developed countries or groupings, such as the EC. Previous GATT Rounds have focused on industrial products and have not embraced developing countries.

Traditionally, negotiations on agricultural trade have occurred mainly between the larger developed countries — including the United States, the EC and Japan — resulting in major trade concessions. During the Uruguay Round, however, other countries, in particular the Cairns Group countries, have more actively taken part in GATT discussions[27].

The bringing of agriculture into the centre stage of the GATT and a greater commitment on the part of developing countries to trade liberalisation has meant that these countries have a large stake in the Uruguay Round. Their dependence on agriculture[28], and their concerns about growing developed country protectionism, and the threat of regionalisation, have meant that even the poorest countries have invested large amounts in their participation in the negotiations[29].

Since 1968, developing countries have mainly relied on the Generalised System of Preferences (GSP) to facilitate trade on a non-reciprocal and non-discriminatory basis. The GSP, however, has come to be regarded by many developing countries as less preferable to preferential arrangements, such as those embodied in the Lomé Convention and the Caribbean Basin Initiative. The poorest countries are particularly sceptical about the GSP as they derive the least benefit from it. In the case of the EC, in 1988 GSP countries saved a total of $1.2 billion on import duties to the EC on exports worth $18.8 billion, but the

poorest countries only derived 1 per cent of the benefit. The scheme mainly benefited the exporters of manufactured goods, notably the Association of South East Asian Nations (ASEAN), including Hong Kong and Singapore.

Agricultural imports covered by GSP rules contribute to only 20 per cent of total GSP trade value of major industrial countries. Furthermore, major consumer countries normally impose import tariff levies which increase according to the degree of processing and value added[30]. Also, GSP provisions do not include NTBs, but, since the 1980s, developed countries increasingly have had recourse to these border measures to insulate domestic agricultural markets. Nevertheless, in previous Rounds negotiated concessions to developing countries have exclusively affected nominal tariff reductions.

Besides the GSP, major developed countries accord preferential entry to most agricultural exports from certain groups of developing countries, such as EC agreements with African, Caribbean and Pacific (ACP) countries and Mediterranean countries or US agreements with Caribbean countries and Israel. However, since tropical and other agricultural products are poorly covered by most GSP schemes, GSP preferential tariffs cover only a minor share (40-45 per cent) of agricultural MFN-dutiable exports from least developed countries to industrial countries.

Individual developing countries do not have the same objectives. For example, given existing preferential agreements between the EC and ACP countries, a reduction of EC's MFN or GSP tariffs on tropical products could have a negative impact on the export revenues of most ACP countries[31]. Consequently, the original EC Uruguay Round proposal to reduce both MFN and GSP tariffs has been opposed by ACP countries because they view this as narrowing ACP preferences compared to GSPs.

Developing countries have not had a united position, and the objectives of single developing countries have been quite distinct. Two main approaches may nevertheless be identified. The first, supported by Brazil and other exporter countries in the 14-nation Cairns Group, is favourable to agricultural liberalisation but demands reciprocity from industrialised countries and exemptions for developing countries. The second approach, taken by agricultural net-importers, such as Egypt, Mexico, Nigeria, Jamaica and Peru, while remaining committed to liberalisation, emphasises the need for mechanisms to ensure that they do not suffer from budgetary or nutritional crises. The overall approach of developing countries in the Uruguay Round has been to defend the Special and Differential treatment where possible and to extend its rules to the whole final agreement[32].

Trade in unprocessed tropical products operates under GATT regulations and it is subject to relatively low levels of import barriers in OECD countries, with the level of tariffs rising with the level of processing, in order to protect the industries which process cocoa in the developed countries[33].

Since the main objective of the Uruguay Round on agriculture is to reduce distortions on the world market, the widening of the coverage to include commodities not covered so far is welcomed by developing countries. They insist, however, on the reaffirmation of the principle of special and differential treatment.

8. Conclusions: Protectionism and Poverty

Many of the arguments justifying past and present agricultural policies have ceased to be valid in developed countries. In particular, the objectives of food security and protection of consumers' living standards can be demonstrated not to be served by protectionist policies. On the contrary, existing agricultural policies have led to severe distortions in resource use. The resulting misallocation of resources has effected the growth potential of all sectors of the economy. Indeed, the spill-over economy-wide effects of agricultural protectionism are more serious than the soaring direct budgetary and other costs. Over time, these negative effects are amplified, so that existing policies need to be examined not simply in terms of their existing costs, but in terms of their dynamic impact on income generation, investment, growth and the environment.

While the aim of the protectionist policies in the industrialised countries has been to support farmers, they have in fact been associated with a decline in the number of farmers and rapid increase in average farm size; it is the large farmers, rather the poorer small farmers who have benefited from subsidies[34]. The urban poor, who spend a higher share of their income on food, also have been particularly disadvantaged by policies which have held food prices well above world market levels.

Policies aimed at internal income redistribution and farmer support should be designed to ensure the maximum effectiveness of the instruments. Agricultural price support policies and other protectionist measures are inefficient mechanisms for supporting farm incomes, with the eventual benefit to the farmer typically representing a minor part of the budgetary and economic costs[35]. For example, it has been estimated that the total costs to consumers and taxpayers of agricultural protection in 1986 was $36 billion[36]. The net benefit to producers was $15 billion. In other words, of the total transfer from consumers and taxpayers of $36 billion, 60 per cent was lost to inefficiency[37].

Direct income supports and other more targeted measures are more effective in overcoming rural poverty and achieving distributive and other social objectives, and more efficient in terms of the budgetary cost of achieving these objectives. Equally important, decoupled direct income support is neutral in its impact on international markets and developing countries, and therefore is compatible with the objective of a level international playing field and global, as opposed to simply national, redistribution[38].

Failure to reform developed countries' agricultural policies will significantly reduce the growth potential of developing and formerly centrally planned countries. A reduction of subsidies to producers in developed countries would raise world prices of key commodities and place developing and other countries on an equal footing with the industrialised countries. Trade liberalisation would benefit food production and those developing countries with export potential, but also have a negative impact on food importers' balance of payments. A reduction in developed countries' agricultural production may result in lower quantities of food aid. Mechanisms should be developed to ensure that developing countries do not suffer from higher cereal prices resulting from trade liberalisation, and that food aid is not conditional on protectionism in the industrialised countries. A number of the poorest countries — and notably those in Africa — stand to gain least from liberalisation. Development assistance packages should be enhanced to compensate for the potential losses in these low-income regions.

The quantitative analysis using the RUNS model clearly demonstrated the effects of protectionism. World prices, trade patterns, trade volumes, and the global distribution of production are all distorted, and lead to an inefficient allocation of resources, both within and across countries. The aggregate measure of these distortions could be $477 billion or more per annum, or roughly half the income of the less developed economies representing a population of 3 billion. A conclusion of the Uruguay Round, even if it only implies partial reform such as envisaged in the Draft Final Act, would add around $195 billion per annum to world income, or about 50 per cent of the income of China.

The probable increase in the world price for cereals and other main temperate products may stimulate production of developing countries *only if* a range of policy measures are taken. These include: i) passing on the rise in world agricultural prices to domestic farmers and ; ii) improving yields through enhancing technologies, storage facilities, distribution, and other related infrastructure. In such a situation, the negative impact of higher world prices on food deficit countries could be dampened and may even lead to a reduction in food imports because of expanded domestic production.

In fact, many developing and formerly centrally planned countries already have adopted trade liberalisation policies; their levels of distortions have fallen dramatically since 1985. Policies which favour equity need to be placed alongside those favouring growth. This will ensure that the critical problem of nutrition and personal food security is addressed. For the 800 million or more people in the world facing malnutrition, what matters is their entitlement to food — the economic power to grow or buy food — rather than the national level of agricultural production[39]. Most poor and malnourished people live in the countryside, and hence policies which are favourable to agriculture tend to improve their prospects. Liberalisation on a global and a national level encourages developing country agriculture and improves rural income in these countries.

Developing countries have learned from bitter experience that they cannot afford the subsidies and distortions which have become endemic in industrialised countries. Their future depends on the establishment of a standardised rule system of international trading, such as that offered by the Uruguay Round of the GATT. The results of our analysis show that the most powerful contribution which industrialised countries can make to their own and to global development is to honour their Punta del Este commitments to "halt and reverse protectionism and to remove distortions to trade"[40]. The challenge for the industrialised countries is to do as they preach, breaking away from the strait jacket they currently find themselves in. The alternative is to leave in place an economic system that violates the principles of the market system on which the OECD economies are based. This deprives the citizens of OECD and non-OECD countries of potential employment and income, undermining their food security, economic prospects and social harmony. The continuation of the current system feeds the forces of political nationalism and economic protectionism. It would be unfortunate if the industrialised world missed this opportunity to incorporate the economies in transition —the formerly centrally planned economies — on an equal basis, providing these countries, as well as the developing countries, a greater chance to participate in a growing world economy. The failure to reach an agreement poses a threat not only to economic recovery and global equity, but also, by fuelling trade conflicts, to peace in the world.

Table 1: **Changes in World Agricultural Prices**
(Per cent Change from Base Simulation Levels in 2002)

	30 per cent Partial Liberalisation	Full Liberalisation
Wheat	-0.4	6.8
Rice	-4.5	-7.1
Coarse Grains	2.3	13.9
Vegetable Oils	2.7	11.3
Sugar	9.3	53.1
Beef, Veal & Sheep Meat	4.0	24.5
Other Meats	-0.8	0.7
Dairy	6.0	44.7
Coffee	-7.2	-18.0
Cocoa	-5.9	-17.3
Tea	0.5	3.7

Table 2: **Income Gains from Trade Liberalisation**

	30 per cent Partial Liberalisation	Full Liberalisation
China	2.5	5.0
India	0.5	1.8
Indonesia	-0.6	-2.6
Low Income Asia	0.7	1.5
ASEAN and Other Asia	2.6	7.9
Sub-Saharan Africa	-0.2	-1.1
Maghreb	-0.5	-1.9
Mediterranean	-0.5	-2.4
Gulf Region	0.5	-1.3
Brazil	0.6	1.5
Mexico	0.3	0.5
Other Latin America	0.6	1.5
United States	0.2	0.3
Canada	0.1	-0.1
Australia, New Zealand	0.1	0.9
Japan	0.8	2.4
European Economic Community	1.0	2.4
European Free Trade Association	1.2	3.0
European Economies in Transition	0.0	-0.5
Former USSR	0.2	0.8

Note: a) The numbers represent changes in total income in the year 2002 as a percentage of the base simulation's GDP in 2002.

Annex: The Rural/Urban-North/South (RUNS) Model

The RUNS model is in a class of models known as applied (or computable) general equilibrium models (AGE). This class of models is designated as *general* equilibrium because these models incorporate supply and demand relations for different economic sectors, rather than only the sector of interest as in *partial* equilibrium models, and also because they include factor markets, labour, land, and capital, and the feedback effects from income to demand and savings. Given the significant distortions involved in the trade negotiations, and the complex interactions between the different sectors of the economy, a partial equilibrium approach gives a less complete assessment of the effects of trade reform. For example, significant agricultural price increases in a developing country would lead to higher incomes for farmers, but reduce the purchasing power of urban consumers. A partial equilibrium model, which simply focused on agriculture, would indicate that farmers gain, and the urban population would lose. However, a general equilibrium model includes a feedback mechanism between farmers and urban production. As farmers' incomes rise, farmers increase their purchases of consumer items such as cars and electrical appliances. This induces a rise in urban production and incomes which can partially or totally mitigate the rise in food prices in the urban sector.

RUNS takes the general approach even further than many AGE models. Instead of limiting the scope of the model to one or two geographic regions, RUNS integrates the entire world. While this approach has certain inconveniences, notably in preparing a complete and consistent data base, it has the advantage that the international effects of trade reform maybe captured and interpreted. One of the key mechanisms which explains the winners and losers from trade liberalisation is the link between world and domestic markets. Trade liberalisation leads to an increase in the world price of food, countries which import food will need to pay more, in other words, they will suffer from a reduction in their terms of trade[41]. There are factors which may partially, or even totally, mitigate the loss in the terms of trade. As it turns out, some regions will lose from multilateral trade liberalisation.

A) The Model

There are three dimensions to the RUNS model: regions, commodities, and time. World economic activity is divided into 22 regions, 6 of which comprise the OECD countries. While many countries have been aggregated into a single region, most of the large countries are modelled individually (see below for the regional and commodity composition of RUNS)[42]. Goods and services have been aggregated into 20 commodity groupings. Due to the agricultural focus of the model, 15 of the 20 commodity groupings are agricultural. Most of the agricultural commodities are narrowly defined, such as wheat, rice, coffee, and

cocoa. The time dimension of the model covers the period 1985-2002. The period 1985-1990 is used to validate the model, since we can compare the model results with observable economic data. Projections are made for the period 1990-2002.

The RUNS model captures some of the dynamic growth processes that are inherent in the world economy. The key factors are factor accumulation — growth in the labour force, and growth in capital via savings and investment — and productivity improvements. Productivity gains are held constant in this version of the model[43].

B) The Distortions

The main instruments of government intervention in the model are trade instruments: import tariffs/subsidies, and export taxes/subsidies[44]. Historically, there have been a wide variety of reasons for implementing trade instruments. Modern European and Japanese agricultural policies were implemented for reasons of food security, and guaranteeing farmers' incomes. Import tariffs in many of the developing countries were initially implemented to protect nascent industries, and as one of the easier ways to collect taxes. Export taxes, such as on coffee, were also an easy way to increase government revenues, as well as to reap some of the benefits of having some monopoly power on world markets. Import subsidies in developing countries, particularly on food commodities, have helped keep food prices in the urban sector low relative to other goods.

Manufacturing. Table A1 presents the average level of tariffs on manufacturing imports across the regions (these are trade weighted averages, excluding services for which no comprehensive estimates of tariffs exist). The largest tariffs are in Asia, varying from 41 per cent to 80 per cent. Amongst the other regions, only Brazil enters this range, with an average tariff of 44 per cent. The wealthier regions tend to have lower tariffs. However, these estimates exclude the impacts of NTBs on domestic prices and levels of imports. Many developing countries have already undertaken significant steps in reducing tariffs in the last few years. Due to the absence of a consistent data base, these most recent reforms have not all been integrated into the base data set.

Agriculture. In agriculture, the distortions present a different picture. The tendency of developing countries has been to tax agriculture (either by taxing exported commodities, or by subsidising imports). There are several reasons for this. Taxing exported commodities has been a convenient source of government revenues, especially where a country may enjoy some market power. The other key reason for taxing agriculture has been to provide a cheap supply of food, particularly in the urban sectors[45]. The incidence of food riots following elimination of food subsidies has been an important factor in determining the pace and level of agricultural reform in developing countries.

In the OECD regions, and the richer developing countries, the major aims of agricultural trade policy are to insulate farmers from variations in world prices, to protect farm incomes, and for food security. While to some extent farmers have been insulated from the world markets and food security has been achieved, farm incomes continue to lag behind non-farm incomes. Moreover, the goal of insulating farmers has led to large and increasing subsidies, putting a strain on fiscal budgets.

Figure A1 presents the average level of support in agriculture as measured by the Producer Subsidy Equivalent (PSE). The PSE essentially measures the ratio of the domestic incentive price to the world price[46]. For example, if the PSE is greater than 1, the domestic price is greater than the world price. If the country is an importer, this represents a tariff. In Japan, the PSE for rice has been well over 5, i.e. the domestic price of rice in Japan is 5 times the world price. In the RUNS model, this is the equivalent of a 400 per cent tariff. In the EC, the PSE for wheat has been between 1.5 and 2. Since the EC exports wheat, this is the equivalent of a 50-100 per cent subsidy on wheat exports. The high levels of PSEs within the OECD regions has led to significant distortions in world agricultural prices as shown by the model simulations.

C) Regional Composition of the RUNS Model

1. China (CHN)
2. India (IND)
3. Indonesia (IDN)
4. Low Income Asia (LIA)

   Afghanistan, Bangladesh, Bhutan, Burma, Kampuchea, Democratic Republic of Korea, Laos, Maldives, Mongolia, Nepal, Pakistan, Sri Lanka, Viet Nam
5. ASEAN and Other Asia (UIA)
6. Sub-Saharan Africa (AFR)
7. Maghreb (MAG)

   Algeria, Morocco, Tunisia
8. Mediterranean (MED)

   Cyprus, Arab Republic of Egypt, Israel, Jordan, Lebanon, Libya, Malta, Syrian Arab Republic, Turkey
9. Gulf Region (OIL)

   Bahrain, Iraq, Islamic Republic of Iran, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Yemen Arab Republic, People's Democratic Republic of Yemen
10. Brazil (BRA)
11. Mexico (MEX)
12. Other Latin America (LAT)
13. United States (USA)
14. Canada (CAN)
15. Australia, New Zealand (ANZ)
16. Japan (JPN)
17. European Economic Community - 12 (EEC)

(including the former German Democratic Republic).

18. European Free Trade Area (EFT)
19. European Economies in Transition (EET)

    Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia

20. Former USSR (FSU)

D) Commodity Composition of the RUNS Model

Agriculture	***Non-Agriculture***
Wheat	Other Manufacturing
Rice	Energy
Coarse Grains	Services
Sugar	Equipment
Beef, Veal, and Sheep	Fertilizers
Other Meats	
Coffee	
Cocoa	
Tea	
Oils	
Dairy	
Other Food	
Wool	
Cotton	
Other Non-Food	

Table A1: **Average Level of Import Tariffs for Manufactures**

(1985, per cent)[a]

China	41
India	80
Indonesia	24
Low Income Asia	57
ASEAN and Other Asia	5
Sub-Saharan Africa	20
Maghreb	24
Mediterranean	16
Gulf Region	8
Brazil	44
Mexico	17
Other Latin America	22
United States	3
Canada	4
Australia, New Zealand	10
Japan	2
European Economic Community	3
European Free Trade Association	1
European Economies in Transition	12
Former USSR	(b)

Source: Estimates are reported in an interim paper: Roland-Holst (1991).

Notes: a) Averages exclude trade in services.

b) No estimates available for the former USSR.

Notes and References

1. The authors gratefully acknowledge the research assistance of Antonio Cordella, Sébastien Dessus, and David Naudé and the comments of Kym Anderson, Evan Rogerson and Frank Wolter of the GATT Secretariat, and David Blandford, and Development Centre colleagues at the OECD. Ian Goldin is Principal Economist and Head of Programme and Dominique van der Mensbrugghe an economist at the OECD Development Centre. The views expressed in this paper are those of the authors, not necessarily those of the OECD. A full discussion of the simulations and analysis which is summarised in this *Policy Brief* is to be found in Goldin *et al.*, *Trade Liberalisation: Towards 2002*, 1993. For a discussion of the country modelling issues, see Goldin *et al.*, *Modelling Economy-wide Refoms*, 1993.

2. GATT (1992a). The measures undertaken include tariff reductions, elimination of quotas, abolition of licencing restrictions and removal of other non-tariff barriers. The rules governing accession to the GATT have become much stricter in recent years, so that countries are now forced to liberalise their trade policies **before** applying for membership.

3. GATT (1986), Part 1, paragraph 1.

4. The only exceptions relate to customs unions and other free-trade arrangements, and to special and differential treatment for developing countries, as discussed below.

5. Czechoslovakia, Hungary, Poland and Romania although long-time members of the GATT, failed to undertake their GATT obligations and were never entitled to the full MFN benefits. These countries are however renegotiating their membership and have been given MFN status. Other formerly centrally planned countries are meanwhile in the process of joining the GATT. China's application to resume membership, which it left in 1950, stalled in 1989 following the political disturbances, ambiguity regarding its commitment to liberalisation, and the question of the status of Taiwan, which has also applied for membership.

6. Trela and Whalley, p. 2, estimate the gains from removing textile and apparel trade restrictions to be $31 billion for developing countries and $22 billion for developed countries.

7. In which the United States was accused of subsidising its chicken exports to W. Germany

8. Other areas, such as services, intellectual property rights and investment were also brought into the GATT negotiations for the first time. The significance of developing country markets is indicated by the fact that they now offer the biggest hope for reducing the US deficit; more than two-thirds of the growth in US exports in 1991 was accounted for by developing countries. Exports grew by an average 7.2 per cent in 1991, pulled up by a growth in demand of 31 per cent from China, 22 per cent from Brazil, and 18 per cent from Mexico.

9. An indication of the trade friction is the increase in the number of anti-dumping cases initiated by major trading partners; in mid-1991, 209 anti-dumping measures were in effect in the United States, 143 in the EC and 71 in Canada. The surge in anti-dumping in the 1980s meant that within that decade 1456 cases were registered with the GATT, placing the institution in the position of intermediary in bilateral conflicts based on controversial national laws restricting trade, rather than enforcing international rules accepted on a multilateral basis.

10. GATT (1986), Part D, para 7.

11. Between the beginning of the 1980s and 1990, assistance to agricultural producers in OECD countries, as measured by the total Producer Subsidy Equivalent (PSE), has increased from $99 billion to $176 billion, i.e 7.5 per cent per annum on average (and 78 per cent over the decade), see OECD (1991), p. 115. In particular, average assistance per farmer (on full time farmer equivalent basis) rose to $15 000, while assistance per hectare farmed increased to $171.

12. GATT (1990) and UNCTAD (1991).

13. Of the different measures of government assistance to agriculture, the more common are the *nominal rate of protection* (NRP) and the *producer and consumer subsidy equivalent* (PSE/CSE). The NRP is the simplest and most widely used measure, but it only takes account of trade barriers and measures the wedge or difference between domestic and world prices. The PSE/CSE is an aggregate measure of the total

assistance to output and inputs associated with agricultural policies. The direct effect is measured by the percentage difference between the producer price and the world price, while the indirect effect takes into account economy-wide interventions, such as exchange rate distortions and industrial protection policies.

14. The changes in income (or *welfare*) are measured using the Economy Trade Expenditure Function, which is a refined version of Hicksian Equivalent Variation (see Goldin *et al.*, 1993, Chapter 2). In essence, this measures the amount of transfer to the economy necessary to achieve the same level of welfare prior to the reform, as that attained after the reform. The income measure is divided by the base simulation GDP, and shown as a percentage. For example, the total income change for Mexico under the 30 per cent partial liberalisation scenario is about $3.6 billion, which represents about 0.9 per cent of the model's projected 2002 GDP for Mexico in the base simulation.

15. See the Annex for the composition of the regions.

16. In the model, petroleum prices are linked to the price of OECD manufacturing exports. We assume implicitly that the OPEC countries desire a stable relationship between the price of their imports (OECD manufactured goods), and the price of their exports (petroleum). A fall in the price of OECD manufactured exports induces a fall in the price of petroleum.

17. See Siamwalla and Goldin and Winters.

18. The Central Limit Theorem shows that as the sample size increases, the variance declines by 1/n. The implication is that increased participation in a market may be expected to lead to a decline in variance. See Goldin and Knudsen, pp. 466-486.

19. As noted in Goldin and Knudsen pp. 476-480, the projected increase in prices resulting from liberalisation is a relatively short-run phenomenon. Since the Second World War, the real price of most agricultural commodities has declined. This downward trend is expected to continue, and to more than offset short-run price rises which may associated with liberalisation. In the longer term, food importers are expected to face lower prices, irrespective of the outcome of the Uruguay Round.

20. The group has a core membership consisting of Jamaica, Mexico, Morocco, Peru, Nigeria and Egypt, and associate membership made up of South Korea, China and India.

21. The Multi-Fibre Arrangement (MFA) which control world trade in textiles and garments expires in December 1992, by which time textiles should be incorporated within a GATT Agreement. Failure to resolve the Uruguay Round would force a renewal and renegotiation of the MFA, but given the stength of the vested interests in the MFA, this is likely to be less favourable to developing countries than the inclusion of textiles within the GATT.

22. See Anderson and Blackhurst for a summary of the debate, and GATT (1992b).

23. RIVM.

24. NTB instruments include quantitative restrictions or quotas, voluntary export restraints, government procurement policies, technical barriers to trade (regulations on health, sanitary requirements, packaging, labelling, etc.), customs valuations and nomenclature.

25. UNCTAD (1991), p. 59; OECD (1990a), p. 75. The estimates are our own calculations based on value shares.

26. Due, in particular, to the waiver from GATT provisions granted to the United States from 1954 and the tacit acceptance of the Common Agricultural Policy of the EC from the late 1960s.

27. The Cairns Group, named after the town in Australia where they first met, includes 14 so-called non-subsidising agricultural exporters (also called fair traders). Members are both developed and developing net-exporter countries, namely Argentina, Australia, Brazil, Canada, Chile, Colombia, Fiji, Hungary, Indonesia, Malaysia, New Zealand, Philippines, Thailand and Uruguay.

28. In developing countries, on average, agriculture accounts for 15 per cent of GDP, 57 per cent of employment and a significant part of their merchandise exports.

29. The cost of participation in the Uruguay Round is extremely burdensome; in order to cover the committees which meet simultaneously and provide support to the delegates, a large staff is required, but this is often beyond the financial or skill scope of the poorest countries, who cannot afford to have a large number of senior staff in Geneva for long periods of time.

30. The notion of effective protection is able to capture the degree to which tariff escalation reflects higher protection, since the effective protection is measured by comparing tariff levy to value added rather than gross output.

31. ACP countries have better preferential tariff entry than other developing countries in some important sectors, such as processed and unprocessed cocoa where Africa competes with Brazil, Malaysia and Indonesia; processed and unprocessed coffee where Africa competes with Colombia and Brazil; bananas where the Caribbean competes with other Latin American countries; pineapples where Africa competes with Philippines; tobacco where Zimbabwe and Malawi compete with Brazil, India and the Republic of Korea; palm oil where West Africa competes with Malaysia; and beef meat where Africa competes with Argentina.

32. During the Uruguay Round, however, the approach of many developing countries has been different, especially with regard to the principle of special and differential treatment. In fact, because of specific structural adjustment accords negotiated directly with the IMF and World Bank, many developing countries have reduced import tariff levies without any reciprocal concessions from developed countries.

33. All major consumer countries charge import tariff levies which rise according to the degree of processing and to the value added. Normally, unprocessed cocoa is imported duty free by these countries, but the EC, because of favouring ACP suppliers, charges a 3 per cent *ad valorem* tariff for cocoa bean imports from non-ACP origins. Tariffs levied on cocoa products vary with countries and final products, but generally higher tariffs are levied on sweetened cocoa powder and chocolate products, both to protect the local cocoa processing industry and as a consequence of the domestic sugar support regime.

34. In the United Kingdom, for example, over the period 1972-87, the average size of dairy farms increased by 69 per cent and cereal farms by 46 per cent, while the number of farmers in these sectors fell by 47 and 28 per cent, respectively (Whitby p. 149). In the EC as a whole, over the period 1980-87, average farm size increased by 10 per cent, while the number of farms fell by 12 per cent (EEC Commission, Table 3.5.4.1) .

35. The fact that existing support is allocated on a blanket basis to the final product, and not directly to the farmer, means that the intermediaries (transport, storage and others) benefit, much of which is absorbed by spillovers into higher input, land and other costs. Farmers also benefit according to their level of output or landholding and not according to their needs. Accordingly, blanket support tends to concentrate wealth within the agricultural sector.

36. See Blandford, pp. 407-408.

37. These inefficiency losses do not include the significant administrative costs associated with the farm programmes.

38. See OECD (1990b), and Goldin (1993). Direct income supports should be “decoupled”, that is not tied to production or farm size levels, as these links serve to encourage higher output or a fragmentation of farms into smaller units, rather than equity in farm incomes.

39. See Brown and Goldin.

40. GATT (1986), Part 1, paragraph 1.

41. Terms of trade are calculated on the relative price of a country’s imports with respect to the price of a its exports. A deterioration in the terms of trade implies that import prices are increasing with respect to the price of exports.

42. For a complete description of the RUNS model, see Burniaux and van der Mensbrugghe, and Goldin *et al.* (1993), Chapter 2.

43. See Goldin *et al.* (1993), Chapter 9, for a discussion linking agricultural trade policy reform and technological growth.

44. The model also incorporates an input subsidy in the agricultural sector. The input subsidy reduces the cost of production, and therefore distorts production decisions.

45. Assuming that farmers are required to sell their produce to the government at below market prices.

46. Measurement of the PSE incorporates both border distortions - the difference between the domestic price and the world price - and other support measures such as direct payments to farmers. In the RUNS model, we distinguish policies which are associated with border distortions, and policies associated directly with production incentives, such as input subsidies.

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