

The Cost of Rich (and Poor) Country Protection to Developing Countries

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This study confirms that substantial barriers to market access will remain in both rich and poor countries following full implementation of the Uruguay Round agreement. The analysis finds that approximately 40% of the costs of these barriers to developing countries arise from barriers to market access in industrial countries and 60% from barriers in developing countries themselves. The results suggest that there would be large gains to almost all regions from a round of negotiations that increased market access in the North and South. In Africa, the potential static gains from multilateral reform appear to exceed those from preferential liberalisation, without the well-known disadvantages of a preferential approach.

1. Introduction

Although rich country protection has in general fallen to very low levels, it remains important in many areas of particular interest to developing countries. Hoekman *et al.* (2001) recently highlighted the importance of tariff peaks in areas of export interest to developing countries, such as sugar, cereals and fish, tobacco, certain alcoholic beverages, fruits and vegetables, clothing and footwear.

Protection in developing countries has fallen considerably in recent years. The World Bank (2000, 2001a,b) showed that the average tariff rates imposed by developing countries have approximately halved since the early 1980s and the variation in tariff rates measured by the standard deviation has also fallen considerably. The incidence of non-tariff barriers has fallen dramatically over the same period (Michalopoulos, 1999). The coverage of restrictions imposed for current account purposes and the black market premiums that reflect

the protective impact of exchange rate distortions have also fallen dramatically.

Developing countries have undertaken these reductions in their own protection, at considerable pain and effort, largely with a view to enhancing their own export performance. Accordingly, the persistence of export barriers in the industrial countries and in the more advanced developing countries is particularly galling.

Concern about the barriers facing developing countries has fuelled pressures for relief, such as the European Union's (EU) Everything but Arms initiative for the less-developed countries (LDCs). It is also highly relevant to the prospects for new multilateral trade negotiations, in which a major incentive for full participation by developing countries will be meaningful reductions in the barriers they face in their trading partners, both rich and poor.

Despite major reforms in the recent past, the potential gains from further liberalisation of tariff and non-tariff barriers are still enormous and they are becoming more important in relative terms over time, thanks to the fall in other barriers to international trade such as transport and communication costs. The relative contributions to those potential gains from the various sectoral policies in different country groups are also important and poorly understood. A necessary part of building support for launching a new World Trade Organisation (WTO) round is reducing such misunderstandings and this can help trade negotiators prioritise their efforts.

As emphasised by Rodrik (2000), trade reform is only one element of successful development policy and many other institutional reforms are required if a country is to develop and reduce poverty successfully. This paper focuses on the direct implications of trade liberalisation for developing countries. The broader dimensions of multilateral trade reform, including the relationship between trade liberalisation and rule making are considered in related papers, including Hertel *et al.* (2001), Martin (2001) and the World Bank (2001a,b). As emphasised by Hoekman (2001), trade liberalisation has an important advantage over positive forms of integration that require the development of institutions (Tinbergen, 1965) because such institutional development can be extremely costly in developing countries (Finger and Schuler, 2001).

The key purpose of the present study is to estimate (i) the extent of both developed and developing countries' import restrictions that will remain after the Uruguay Round is fully implemented and (ii) the

potential economic welfare effects on different country groups of reducing those distortions. In particular, we seek to evaluate the relative importance of remaining trade barriers in both industrial and developing countries. In order to do that, we use the global economy-wide model known as the Global Trade Analysis Project (GTAP) [see Hertel (1997) and McDougall *et al.* (1998) for comprehensive documentation].

By its nature the model takes into account two key determinants of the economic benefits of multilateral trade reform, namely the inter-sectoral structure of protection and the shares of world production, consumption and trade held by different country groups. Using the GTAP model, projections of labour force growth and investment in physical and human capital are used for projecting changes in the structure of individual regions and of the world economy from the model base year of 1995 to 2005, the year in which the Multi-Fibre Arrangement (MFA) quotas on textiles and clothing will be abolished. The tariff data are based on 1995 levels and the reductions agreed in the Uruguay Round, while the growth rates of quotas on textiles and clothing are as specified in the Uruguay Round agreement on textiles and clothing up to their abolition in 2005. The results make it clear that, even after the full implementation of Uruguay Round market access commitments, sizeable welfare gains remain to be realised. In particular, food and clothing producers in developing countries together with consumers of those products in advanced economies will benefit hugely from further trade liberalisation of those product markets.

In the next section of this paper we examine the reforms undertaken during the Uruguay Round and the legacy of protection remaining after the full implementation of the results of these negotiations. Next, we consider the frequently misunderstood nature of the impacts of international trade reforms on developing countries. Then, we consider the estimated impacts of global trade reform on developing countries and Africa in particular. Finally, we examine the additional insights that might be obtained from the burgeoning literature on reducing the trade barriers facing developing countries.

2. The Structure of Protection Post-Uruguay Round

The structure of protection remaining after the Uruguay Round is such

that there are likely to be major gains from further liberalisation of world trade because of the following factors.

1. Agriculture in many developed countries remains very heavily protected from import competition by tariffs and tariff rate quotas (TRQs) and, in some cases, also by large production and export subsidies.
2. The protection of textiles and clothing in key developed countries remains high even after the phase-out of the quotas introduced under the MFA.
3. Developed country imports of some manufactures are subject to tariff peaks and exports are constrained by tariff escalation, with raw materials subject to much lower tariffs than the processed product.
4. Restrictions on trade by most developing countries, despite having been reduced in recent years, continue to be severe for a wide range of products.
5. Bound tariffs are well above applied tariffs for some developed country imports (particularly agricultural goods) and for most imports of developing countries, meaning tariffs can be raised so long as they remain below the bindings.
6. The barriers to services trade and investment and on government procurement in both rich and poor countries have barely begun to be dismantled.

As column 2 of Table 1 shows, after the Uruguay Round is fully implemented (i.e., by 2005) bound tariffs for agriculture will average 24%, as compared with 12% for textiles and clothing and 6% for other manufactures. Even getting agricultural and textile bound tariffs down to currently applied rates on those products would require big cuts. Yet the applied rates for textiles and clothing are 2.5 times and agriculture's rates are 3.5 times those for other manufactures (column 3). Clearly, action is needed in the next WTO round on two tariff fronts: getting bound rates down to applied rates and lowering rates more for these two outlying industry groups. Both are of vital interest to developing countries in particular.

The extent of the cuts needed is enormous. On the first front, a bound tariff cut for agriculture three times greater than in the Uruguay Round would be needed in order to bring the average bound rate down to the applied rate average for that sector (compare columns 1 and 4 in Table 1). A cut 40% deeper than in the Uruguay Round would be required in order to close the gap even for manufactures.

On the second front, the final column in Table 1 shows that a one-third cut in the bound tariffs on 'other manufactures' would bring its average down to each region's average applied rate for all goods,

Table 1: *Depth of Uruguay Round Tariff Cuts and Post-Uruguay Round Bound and Applied Tariffs on Imports, by Sector and Region*

	Depth of UR cut in bound tariff rate t (as % of 1 + t)	Post-UR bound tariff rate (%)	Post-UR applied tariff rate (%)	Depth of cut needed ^a	Propor- tional cut needed ^b
Agriculture					
OECD countries	1.5	15	14	0.9	83
Developing economies	4.7	60	18	26.3	78
All WTO members	2.6	24	14	8.1	82
Textiles & clothing					
OECD countries	1.4	11	8	2.7	76
Developing economies	4.1	24	21	2.4	45
All WTO members	1.6	12	10	1.8	53
Other manufactures					
OECD countries	1.0	4	3	1.0	35
Developing economies	2.7	20	13	5.8	34
All WTO members	1.3	6	4	1.9	35

Source: Finger and Schuknecht (1999). UR, Uruguay Round.

^aIn bound tariff rate t (as % of 1 + t) to bring it down to sector's post-Uruguay Round applied rate.

^bIn bound tariff rate t (as % of t) to bring it down to region's post-Uruguay Round average applied rate.

whereas for textiles and clothing a cut of approximately one-half would be needed. For agriculture (including processed food) the cut would have to be a massive four-fifths. The situation is even worse for the bulk agricultural products that are the focus of the Organisation for Economic Co-operation and Development's (OECD) monitoring and evaluation work. In 1999, the average nominal assistance for these commodities was 58%, which represented a transfer of \$356 billion or \$11,000 per farmer to rich country farmers, of which two-thirds was provided through distortions to market prices (OECD, 2001).

By binding tariffs well above applied rates, countries have been able

to vary applied tariffs below the binding so as to stabilise the domestic market in much the same way as the EU did with its system of variable import levies and export subsidies for farm products. Among other things, this means there has been little of the reduction in fluctuations in international food markets that tariffication was expected to deliver.¹

As if that were not enough, a third front requires attention. Agricultural-importing countries agreed to provide minimum market access opportunities in the Uruguay Round, such that the share of imports in domestic consumption for products subject rises to at least 5% by the year 2000 under a TRQ (less in the case of developing countries). Even though within-quota imports attract a much lower tariff than out-of-quota imports such TRQs have several undesirable features: they legitimise a role for state trading agencies, they generate quota rents, they introduce scope for discriminating between countries and they can reduce national welfare by much more than similarly protective import tariffs.

A number of these undesirable features of TRQs in food-importing countries, 1,366 of which have been notified to the WTO, are illustrated in Elbehri *et al.* (1999). Table 2 summarises some of the data from that study. The low in-quota and very high out-of-quota tariffs mean potentially huge benefits are going to the people fortunate enough to have been allocated quota licences. In numerous cases quotas are far from being filled, one possible reason being that quotas are allocated (inadvertently or deliberately) to imports from high-cost suppliers who are incapable of making full use of them. And the fact that the quota often represents a high proportion and sometimes 100% of actual imports suggests some out-of-quota tariffs are virtually prohibitive.

Thus, without underrating the Uruguay Round's achievement in establishing rules for agricultural trade and securing some farm policy reform, it has to be recognised that very limited progress has been made over the past 5 years via the WTO in reducing agricultural protection and market insulation. A great deal of farm reform remains to be undertaken relative even to textiles and clothing, let alone other

¹ However, Francois and Martin (1998) demonstrated that, since many agricultural tariffs are specific and farm prices fluctuate from year to year for seasonal reasons, binding those tariffs does lower both the mean and variance of their *ad valorem* equivalents over time, sometimes even when the bindings are well above the applied rates.

Table 2: *In-quota and Out-of-quota Tariff Rates and Estimated Maximum TRQ Rents, Selected Agricultural Products and OECD Countries, 1996*

	In-quota ad valorem tariff (%)	Out-of-quota ad valorem tariff (%)	Maximum quota rents (\$US billion)	Quota fill ratio (%)	Quota as a % of total imports
European Union					
Wheat	0	87	0.0	21	2
Grains	35	162	0.4	74	26
Sugar	0	147	2.4	100	87
Dairy	24	91	1.1	99	80
Meats	19	128	2.3	100	73
Fruit & veg	11	51	0.0	78	20
United States					
Sugar	2	129	1.0	97	76
Dairy	11	70	0.6	77	95
Meats	5	26	0.0	67	102
Canada					
Wheat	1	49	0.0	27	218
Grains	1	58	0.0	5	2400
Dairy	7	262	0.3	100	75
Meats	2	27	0.0	124	72
Japan					
Wheat	0	234	3.4	109	95
Grains	0	491	10.8	109	84
Dairy	29	344	2.8	93	91
Korea					
Rice	5	89	0.0	100	53
Grain	3	326	1.9	148	61
Oilseeds	8	545	0.0	157	62
Dairy	21	106	0.0	85	106
Meats	40	42	0.4	97	77
Fruit & veg	47	305	0.0	99	83

Source: Elbehri *et al.* (1999).

manufactures. Nor are the distortions restricted to OECD countries: Table 1 shows that, despite bigger cuts during the Uruguay Round, developing countries' tariffs remain above those in the OECD in all three groups of goods.

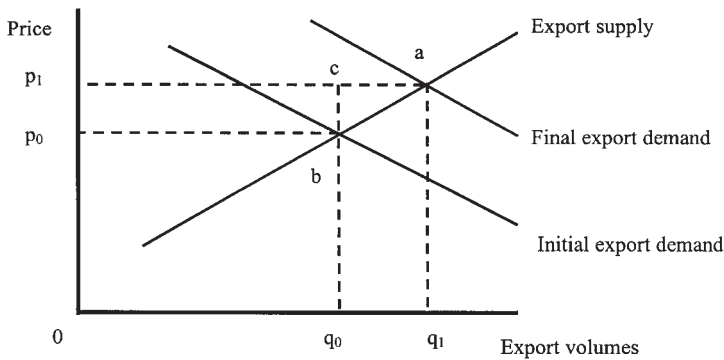
The benefits of liberalising merchandise trade estimated in this study are particularly conservative in that they omit the effects of liberalising measures such as excessively protectionist standards, which have been shown to impose sizeable barriers to developing country exports in some cases (Otsuki *et al.*, 2001). Another important omission is the protective effect of anti-dumping measures, which have been shown to discriminate much more heavily against the exports of developing countries than the industrial countries (Finger *et al.*, 2000). As for services, the Uruguay Round certainly made a useful beginning via the General Agreement on Trade in Services, but very little actual liberalisation has been delivered yet. So that too remains a huge area for gains from trade and investment liberalisation.

3. Understanding the Welfare Impacts of Reform

The welfare gains from trade reform are widely quoted, but frequently poorly understood. Using models where production is characterised by constant returns to scale the key impacts of the liberalisation of trade policy reforms under consideration can be understood in terms of a relatively simple set of partial equilibrium diagrams, which can be given a rigorous interpretation using the balance-of-trade function (see Martin, 1997). These diagrams allow the welfare impacts of reform to be broken up into those resulting from increases in allocative efficiency and those resulting from changes in the country's terms of trade. However, the links between these two sources of welfare change are quite subtle and warrant close consideration before examining actual estimates. Given our focus of attention on the benefits obtainable from improvements in market access, we examine these impacts first.

The reduction in the protection imposed on a country's exports shifts the demand curve for its exports to the right, as is shown in Figure 1. The result is an increase in the volume of exports and an increase in the price received for these exports from p_0 to p_1 . The resulting increase in the price of exports creates welfare benefits to the exporter, as measured in Figure 1 by the trapezoid p_1abp_0 . This area can be decomposed into a rectangle p_0bcp_1 , which is associated with the

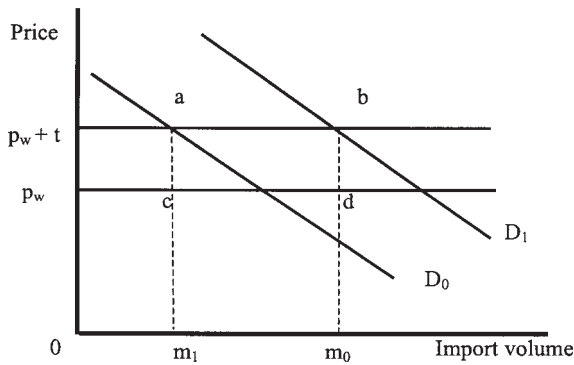
Figure 1: *Impacts of a Reduction in the Tariff Facing a Country's Exports*



increase in the value of initial period exports and a triangle acb , which is associated with the induced increase in export volumes.

When the exporting country has substantial trade barriers there are likely to be some other welfare changes resulting from changes in the volumes of imports subject to distortions. Import volumes are generally likely to increase, in part because of a shift of resources into the production of exports and non-traded goods and in part because of an increase in real incomes in the exporting country. Where these imports are subject to distortions, there will be a second-best increase in welfare because each unit of imports costs less on world markets than its value to users behind the tariff wall. This effect is represented by the shift in the import demand curve in Figure 2 from D_0 to D_1 for imports from partner countries and the consequent gain in welfare is shown by the area $abdc$.

When the increase in access is on products directly supplied to the liberalising market there are likely to be increases in the country's import demands for several reasons. First, the rise in domestic prices resulting from the increases in prices for exports is likely to switch demand towards imported goods. Second, there will be changes in the volumes of imports resulting from changes in real incomes. While there is some controversy in the literature as to whether these should be included in measurements of welfare (Anderson and Martin, 1996), they are included in money metric measures of the type used in the GTAP model. However, in a multicountry, multicommodity world, the sign as well as the magnitude of these impacts is likely to need to be evaluated empirically. Liberalisation of commodities that are imported

Figure 2: *Impacts on Import Volumes Passing Across Tariff Barriers*

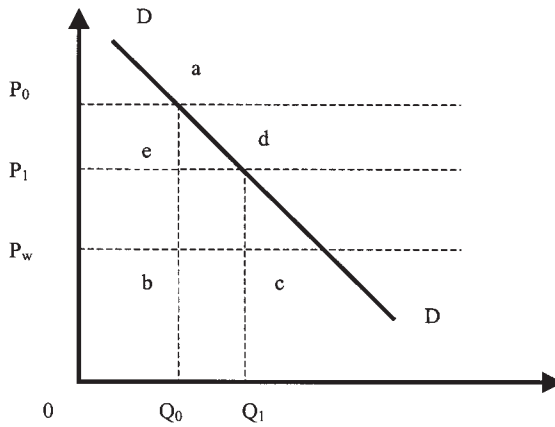
by the country of interest will result in a terms of trade loss to that country. If this product is also protected, there may well be a second-round loss as the volume of imports passing over the country's protective barriers declines [see Martin (1997) for the analytics of this case].

When a country reduces its own barriers, either autonomously or as part of a broader multilateral reform package, the direct impacts of this reform can also be demonstrated using a simple, diagrammatic approach, such as that in Figure 3. In this figure, the demand for imports of a particular good is shown by the downward-sloping excess demand curve, DD . The initial level of protection is represented by the difference between the initial domestic price P_0 and the world price P_w . When tariff protection is reduced, the domestic price falls to P_1 . An immediate consequence of this liberalisation is an increase in the volume of imports from Q_0 to Q_1 .

The welfare increase resulting from the reduction in protection is represented by the area $abcd$ in Figure 3. This gain includes a 'welfare triangle' (ade) that is associated with the decline in the price of imports as the quantity increases and a second-best rectangle ($ebcd$) that is identifiable with increases in the volume of imports at final prices. An important point evident from careful inspection of Figure 3 is that the welfare gains from any given tariff reduction (say one percentage point) are larger if the initial level of protection is higher.

While the diagrammatic treatment outlined above is useful for building intuition about the impact of trade reform measures, there are many simultaneous interactions to consider and we use the GTAP

Figure 3: Implications of Reductions in a Country's Own Protection Rate



global general equilibrium model for capturing them. We consider both the elimination of tariff protection and the abolition of rich country quotas against developing country exports of textiles and clothing. In order to represent these changes, we first project the structure of the world economy forward to 2005 using the procedures outlined in the Appendix and then abolish the protection that remains following the Uruguay Round.

4. Potential Gains from Further Trade Reform

Given the distortions² expected to remain in product markets by 2005 following Uruguay Round implementation, what would be the size and distribution of gains from moving to free trade as of 2005? Table 3 summarises the model's estimated economic welfare benefits from such a reform or, equivalently, it summarises the annual costs of continuing the distortions to merchandise trade. These are bare bones, comparative-static, welfare estimates of the type measured in

² Due to limitations with the software that was used for aggregating the source data on tariffs, it was not possible to incorporate the effects of tariff preferences in the protection estimates in the model. This will clearly result in some overstatement of the benefits of liberalisation to those countries that receive preferences. A fuller treatment of this question should be possible with the software (WITS) and data (TRAINS) nearing completion as part of a joint UNCTAD/World Bank project.

Table 3: *Sectoral and Regional Contributions to the Economic Welfare Gains^a from Completely Removing Trade Barriers Globally, Post-Uruguay Round, 2005*

Liberalizing region	Benefiting region	Agriculture and food	Other primary	Textiles & clothing	Other manufactures
<i>In 1995 US\$ billions</i>					
High income	High income	110.5	-0.0	-5.7	-8.1
	Low income	11.6	0.1	9.0	22.3
	Total	122.1	0.0	3.3	14.2
Low income	High income	11.2	0.2	10.5	27.7
	Low income	31.4	2.5	3.6	27.6
	Total	42.6	2.7	14.1	55.3
All countries	High income	121.7	0.1	4.8	19.6
	Low income	43.0	2.7	12.6	49.9
	Total	164.7	2.8	17.4	69.5
<i>In per cent of total global gains</i>					
High income	High income	43.4	0.0	-2.3	-3.2
	Low income	4.6	0.1	3.5	8.8
	Total	48.0	0.0	1.3	5.6
Low income	High income	4.4	0.1	4.1	10.9
	Low income	12.3	1.0	1.4	10.9
	Total	16.7	1.1	5.5	21.7
All countries	High income	47.9	0.1	1.9	7.7
	Low income	16.9	1.0	4.9	19.6
	Total	64.8	1.1	6.8	27.3

Source: Anderson (1999), produced with the help of new software developed by Ken Pearson.

^a No account is taken in these calculations of the welfare effects of environmental changes associated with trade liberalisation, which could be positive or negative depending in part on how environmental policies are adjusted following trade reforms. Nor are services distortions taken into account.

Figures 1–3. As noted previously, they do not include the adverse impacts of protection created by anti-dumping and safeguard measures or the protectionist use of standards. Further, they make no allowance for possible dynamic gains from trade expansion. The

results suggest that, if all such merchandise trade distortions were removed globally, an aggregate welfare gain of more than \$250 billion per year could be expected. This does not include any gains from services trade and investment liberalisation, from economies of scale and reductions in imperfect competition or from the dynamic effects of reform on investment. High-income countries reap the majority of those gains, but only just. Certainly low-income countries benefit much more as a percentage of gross domestic product (GDP), given that they account for less than one-quarter of global GDP (Table 3).

Almost half (48%) of the estimated global economic welfare gains (ignoring environmental effects) would come from agricultural and processed food policy reform in high-income countries. This is despite the fact that such products in those countries contribute only 4% of global GDP and only 6% of world trade. Another one-sixth of those global welfare gains would come from reform of the farm and food policies of developing countries (defined here as in the WTO to include newly industrialised countries such as Korea).

The textiles and clothing reforms appear small by comparison with agricultural reform: their potential global welfare contribution is barely one-tenth that of agriculture's (7% compared with 65%). This big difference reflects three facts: one is that projected tariffs for agriculture are approximately 40% higher than those for textiles and clothing in 2005 (Table 1). Second, the WTO also aims to discipline the massive domestic subsidies provided to agriculture in the OECD countries. Finally, textiles and clothing contribute only 1.5% to the value of world production, as compared with 8% for farm and food products.

However, two assumptions are crucial in generating the results reported in Table 3. One is that China and Chinese Taipei are assumed to have joined the WTO and to have enjoyed the same accelerated access to OECD markets under the Uruguay Round Agreement on Textiles and Clothing (ATC) as other developing countries that already are WTO members. The other crucial assumption is that high-income countries fully implement the ATC. There are of course real risks that the industrial countries might attempt to renege on their commitments to abolish these measures, although the almost painless abolition of voluntary export restraints under the Uruguay Round and the virtual elimination of new quotas under the ATC (Reinert, 2000) provide some encouragement. Dropping either of those assumptions greatly reduces the estimated gains from Uruguay Round implementation [see the

earlier Anderson *et al.* (1997a,b) analysis] and, therefore, would raise the potential gains from textile and clothing reform in the next and subsequent WTO rounds.

Even so, agricultural protection will remain far more costly to the world economy than barriers to textiles and clothing trade and more than twice as costly as protection to other manufactures, despite the latter having much bigger shares in the value of world production, consumption and trade than farm and processed food products.

The distribution of the gains across regions that would result from full trade liberalisation is also presented in Table 3. As always, most of the gains accrue to the liberalising region. For example, all but one-tenth (11.6/122.1) of the gains from high-income countries removing distortions to their trade in farm and food products accrue to those high-income countries themselves. Even so, agricultural trade reform contributes more than one-quarter of the total welfare gains to developing countries from developed countries liberalising their merchandise trade (11.6/43.1). As for developing countries liberalising their own farm and food policies, three-quarters of the benefits from their farm reform would stay with the developing countries themselves (31.4/42.6) and those policies contribute almost half of the gains from those countries' overall merchandise trade reform (31.4/65.1). These large shares reflect not only the significant distortions in those countries, but also the fact that the food and agricultural sector is such a large part of the economy of developing countries.

WTO members were therefore right to insist that agricultural reform must continue into the new century without a pause. In particular, developing countries as a group have a major stake in the process of farm policy reform continuing: according to the model results in Table 4 farm and food policies globally contribute 37% (42.6/114.7 or, equivalently, 16.7/45.1) of the cost to developing economies of global goods trade distortions. Textile and clothing policies also harm them greatly and nearly as much as farm policies.³ That having been said, it needs to be stressed that distortions in other manufacturing markets are non-trivial too, particularly for developing countries where they could boost welfare by \$50 billion per year if removed globally

³ It should be recognised that these results ignore the effect of tariff preference erosion. In so far as a developing country receives such preferences at present in OECD markets, the above results slightly overstate the potential gains from their reforms.

Table 4: *Gains from Merchandise Trade Liberalisation (1995 US\$billion)*

Country/region	Rich country liberalisation			Developing country liberalisation			Global liberalisation, all merchandise	
	Total	Prim.	Manuf.	Total	Prim.	Manuf.	No.	%
North America	2.57	11.37	-8.80	19.41	8.51	10.91	21.99	0.2
Western Europe	50.29	60.81	-10.52	20.68	2.02	18.66	70.97	0.7
Australia/New Zealand	7.69	8.25	-0.55	1.83	1.23	0.60	9.53	2.0
Japan	36.02	29.98	6.04	7.69	-0.33	8.02	43.71	0.8
China	5.01	-4.63	9.64	-10.79	-3.60	-7.19	-5.78	-0.4
Taiwán	3.04	0.77	2.27	3.48	-1.18	4.66	6.52	1.5
Other NIEs	0.93	-2.89	3.82	20.61	13.15	7.46	21.54	2.7
Indonesia	0.63	0.16	0.47	1.38	0.22	1.16	2.00	0.9
Other SE Asia	0.43	-0.90	1.33	10.25	5.67	4.59	10.69	2.6
India	3.69	0.68	3.01	5.14	1.90	3.24	8.83	1.8
Other S. Asia	1.37	0.12	1.25	5.22	3.02	2.20	6.59	4.6
Brazil	3.11	1.44	1.67	13.29	4.59	8.71	16.41	2.0
Other Latin America	14.83	14.25	0.57	4.47	2.75	1.73	19.30	2.4
Turkey	0.12	-0.59	0.71	1.94	0.60	1.33	2.05	0.9
Middle East & N. Africa	-1.07	-2.81	1.74	-0.71	-0.35	-0.36	-1.78	-0.2
Economies in transition	4.49	1.21	3.28	1.90	2.30	-0.40	6.40	0.7
S. African Customs Union	0.86	0.76	0.10	0.51	0.38	0.13	1.36	0.9
Other Sub-Saharan Africa	1.72	1.58	0.14	1.49	1.23	0.27	3.22	1.4
Rest of world	3.92	2.62	1.30	6.87	3.24	3.63	10.79	3.0
Developing	43.08	11.77	31.31	65.06	33.90	31.17	108.14	
Industrial	96.58	110.41	-13.83	49.61	11.43	38.18	146.19	
LMICs	39.11	13.89	25.22	40.97	21.92	19.05	80.08	
Total	139.65	122.18	17.48	114.68	45.33	69.35	254.33	

The definition of developing countries in this table follows the WTO practice of self-declaration. The low and middle income (LMIC) group is based on World Bank income criteria and excludes Taiwan, China and the other newly industrialized economies (NIEs).

(slightly more than the \$43 billion from agricultural reform). It also needs to be stressed that the majority (more than three-fifths) of the gains from liberalization, even when considering broad groups of

countries as in Table 4, come from each country group's own reforms rather than from the other group's reforms.⁴

5. The Regional Distribution of Gains

While there is considerable interest in the distribution of gains by developing countries as a whole, most attention focuses on the impacts of trade reforms on individual countries or groups of countries. Table 4 spells out the impacts of reform on the 19 countries and regions identified in the analysis. Table 4 considers only two reforms, agricultural and manufacturing, since the results in Table 3 suggest that this aggregation will be sufficient for most purposes.

Table 4 reveals that the gains from overall industrial country liberalisation are very widely distributed. Except for the Middle East and North Africa (−\$1.07 billion) and China all regions in the model benefit. The largest gains by far go to the EU, which benefits enormously from the liberalisation of its agricultural policies (\$60.81 billion). Most developing country regions are found to benefit from reform of primary commodity trade in the industrial countries. In particular, the two Sub-Saharan African regions in the model are found to benefit from the reform. This indicates that the benefits to Africa from increased market access for their exports will outweigh the losses resulting from higher prices for commodities and particularly agricultural commodities, which they import. This is valuable reassurance given the concerns of the net food importing countries about rising food prices following successful implementation of agricultural reform. However, some regions and countries within regions are likely to suffer as a result of increases in the world prices of key agricultural goods and policy action to deal with these problems needs to be planned.

All developing country regions are found to benefit from industrial country liberalisation of manufactures trade. Adding these gains to those from primary commodity reform gives an indication of the total impact of industrial country liberalisation on developing countries. The total impact is positive for all regions except the Middle East and

⁴ Notice that, in the case of manufactures liberalisation by high-income countries, elimination of those very low tariffs actually generates a small loss to these economies. This is because the efficiency gain from reducing those low tariffs is more than offset by a decline in the region's terms of trade.

North Africa. The largest developing country gainers are the two Latin American regions of Brazil and Other Latin America, which gain a total of almost \$18 billion, mostly from agricultural trade reforms. India, China, Taiwan, China and the economies in transition are also substantial gainers. The Sub-Saharan African countries collectively gain approximately \$2.5 billion per year.

Table 4 also shows the distribution of the \$65 billion in total gains to developing countries from their own liberalisation. In most cases, the gains to developing country regions from developing country liberalisation are larger than the gains from industrial country reform. However, there are some exceptions, including China where developing country reform, including China's own reforms, generates negative welfare impacts. These contrast with the gains of close to \$30 billion estimated by Ianchovichina and Martin (2001) as resulting from the reforms associated with WTO accession and highlight the point made in relation to Figure 3, i.e., that reforms beginning at a high level of protection generate the largest efficiency gains. The only other region to lose from developing country reform is the Middle East and North Africa.

When all developing countries liberalise together, there are efficiency gains from reducing their own protection, gains from improved market access in each other's markets, potential terms of trade losses associated with increased export supplies and import demands and potential terms of trade losses associated with increased competition in third markets. The losses to the Middle East and North Africa are primarily driven by terms of trade losses and reflect increased competition in third markets for some of their exports.

6. Sources of Developing Country Impacts

The primary impact of rich country protection on developing countries is through changes in the prices that developing countries receive for their exports and pay for their imports. However, as is clear from the second section of the paper and from Martin (1997), other second-best impacts may need to be taken into account, particularly in highly distorted economies. This is important from an analytical point of view, since a first-order assessment of terms of trade impacts can be made with only information on price changes and countries' net trade positions, while second-best welfare evaluation requires a

representation of the economy's behavioural response to the policy change.

In order to examine this question more closely, Table 5 provides estimates of the extent to which countries and regions gain (or lose) from changes in the terms of trade or in allocative efficiency when the industrial countries liberalise their trade policies. For the industrial countries that are undertaking the liberalisation, the allocative efficiency impacts are generally the most important, except in Australia/New Zealand, where the terms of trade impacts of agricultural trade

Table 5. *Terms of Trade and Allocative Efficiency Effects of Rich Country Liberalisation (1995 US\$billion)*

Country/region	Total	Terms of trade	Allocative efficiency
North America	2.57	0.97	3.54
Western Europe	50.29	-46.21	95.12
Australia/New Zealand	7.69	7.48	0.32
Japan	36.02	-9.74	46.89
China	5.01	7.14	-1.62
Taiwan	3.04	3.31	0.04
Other NIEs	0.93	1.43	-0.81
Indonesia	0.63	0.69	0.07
Other SE Asia	0.43	1.83	-1.39
India	3.69	3.43	0.33
Other S. Asia	1.37	1.18	0.13
Brazil	3.11	2.85	0.30
Other Latin America	14.83	13.26	1.46
Turkey	0.12	0.42	-0.30
Other Middle East & N. Africa	-1.07	-0.17	-0.91
Economies in transition	4.49	5.90	-1.20
S. African Customs Union	0.86	1.05	-0.22
Other Sub-Saharan Africa	1.72	2.46	-0.58
Rest of the world	3.92	2.33	1.06
Developing	43.08	47.08	-3.66
Industrial	96.58	-47.50	145.87
Total	139.65	0.00	142.21

The approach taken is that of Huff and Hertel (2001). The decomposition presented omits the effects of changes in the marginal utility of income and hence does not necessarily add up to the total precisely.

reform loom large. However, in developing countries, the terms of trade impacts tend to dominate the allocative efficiency impacts for this shock, the primary impact of which on developing countries is through their terms of trade. The allocative efficiency impacts are typically positive in those cases where reform stimulates activities that are taxed under the country's own trade regime and negative in those where it stimulates the subsidised sectors.

In summary, it appears that the direct terms of trade impacts of increased market access dominate the second-best allocative efficiency impacts for most developing country regions. This is a similar finding to that of Hertel and Martin (2000) for global trade reform. However, it is in sharp contrast with the finding of Fukase and Martin (2000) that the induced efficiency impacts for Vietnam of improved market access to the US market accounted for approximately one-third of the total gains even though the primary impact of this shock was through the terms of trade.

7. Results from Other Studies

Despite the attention focused on the issue of market access, very few studies have estimated the welfare impacts of increases in this access, although many have estimated the impacts on export values. However, several studies of post-Uruguay Round liberalisation are available to provide a benchmark against which our aggregate welfare results may be compared. The World Bank (2001a) has surveyed this body of literature. From this survey, it appears that our estimate of the global welfare impacts of liberalisation is in the middle of the range.

The study by Dessus *et al.* (2001) for the OECD Development Centre reports much smaller static gains (\$82 billion) from global trade liberalisation under similar assumptions to those that we have used. The difference cannot be explained in terms of the base year: the OECD results are reported in 2010. The likely main explanation for the difference is use of the standard GTAP trade elasticities, which are intended to represent a 3–5 year period, in the OECD study. In this study, we adopt larger values that are intended to capture longer run substitution possibilities (see the Appendix).

The Australian Department of Foreign Affairs and Trade (1999) study used a methodology very similar to ours, except that it used different estimates of the magnitude of the barriers to trade. The present study estimates the global gains from complete liberalisation

of merchandise trade to be around \$250 billion per year. An interesting feature of the Australian study is its estimate of the potentially large gains from liberalisation of services trade at approximately \$500 billion per year. The results presented do not allow the gains from improved market access in industrial countries to be identified. A recent study by Dee and Hanslow (2000) examined the implications of liberalising market access for both merchandise and services trade. It estimated the gains from each to be approximately \$133 billion per year, of which approximately \$80 billion accrues to developing countries.

The World Bank (2001a) estimated the benefits from global liberalisation of merchandise trade to be \$344 billion per year. This result is higher than that reported in this paper for a number of reasons, including the use of the GTAP 5 database for 1997, in which the agricultural protection estimates are generally higher.

All of the studies examined thus far have focused on increases in market access undertaken on an Most Favoured Nation basis. Another relevant comparison is with increases in market access given on a preferential basis for which there have been many initiatives as part of the confidence-building measures for least-developed countries at the WTO. Thirty countries have made such market opening offers, with two countries, Norway and New Zealand, offering to drop all barriers to LDC exports and the EU proposing liberalising everything but arms.

A recent study by Ianchovichina *et al.* (2001) provided estimates of the benefits of this type of market access to Sub-Saharan Africa. They concluded that the elimination of tariffs on exports from Sub-Saharan African countries to the Quad (Canada, the EU, the USA and Japan) countries would increase real incomes in the region by approximately 1% per year, an increase of the same order of magnitude as our estimate for non-discriminatory liberalisation. This suggests that the gains from non-discriminatory, multilateral discrimination are of the same order of magnitude as those obtainable from preferential access to the Quad countries. Given the choice, there are a number of reasons to prefer the non-discriminatory reform. Under the preferential approach to liberalisation, some of the gains come at the expense of other developing countries, the exports of which are displaced. Further, the multilateral approach avoids locking poorer countries into the production of commodities in which market access is valuable because of high protection in the importing country, rather than because of a comparative advantage in the exporting country.

A number of studies have added a productivity term estimated from the relationship between trade openness and growth and found that these greatly increase the measured gains from trade. Dessus *et al.* (2001), for example, reported an increase in their global welfare gains from \$80 billion to \$1200 billion when this term is introduced. The World Bank (2001a) incorporated dynamic impacts at the sectoral level and found an increase from \$344 billion per year to \$759 billion. Rodrik (2000) raised serious questions about the direction of causality in this relationship. However, Dollar and Kraay (2001) found that correction for the resulting endogeneity actually increased the estimated coefficient in their augmented growth regression. While it seems likely to us that there are large benefits from increased openness when other policy preconditions are in place, the wide variation in the currently available estimates gives rise to concern about their robustness.

8. Conclusions

A key conclusion of this study is that, despite a great deal of liberalisation in the Uruguay Round and through countries' unilateral trade reforms, much protection remains in both industrial and developing countries. Protection levels are generally low in the industrial countries, except in agriculture and in textiles and clothing, which are areas of particular interest to developing countries. Although they have declined substantially, protection levels remain higher in developing countries than in industrial countries.

In this situation, a key question is whether developing countries should focus on increasing their access to industrial country markets or whether the greatest gains are obtainable through reductions in their own protection levels. The approach used in this study allows the relative benefits obtainable from these sources to be identified and measured. The results suggest that there are large benefits obtainable from increases in access to industrial country markets for goods, with an aggregate potential gain to developing countries from this source of \$43 billion per year. Put another way, this is the cost for developing countries of industrial countries' post-Uruguay Round protection. The cost of developing countries own protection, taken as a group, is even higher, at \$65 billion per year.

These overall welfare results obtained in the model-based analysis are within the (broad) range of estimates obtained from similar modelling studies of post-Uruguay Round trade liberalisation. A review of

the literature also concludes that the gains identified in this study could be augmented considerably by liberalisation of trade in services.

The results of this study provide support for approaches to liberalisation that both expand market access to developing countries' exports and liberalise trade policies in developing countries themselves. While the majority of the gains from such a reform would come from liberalisation in the developing countries' themselves, approximately 40% of the gains to developing countries would come from increases in market access in industrial countries. Clearly, the results of this study suggest that there would be great benefits to developing countries from a round of trade negotiations that reduced barriers in both North and South.

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Appendix : GTAP Projections to 2005

Methodology

We employ the widely used GTAP model of global trade (Hertel, 1997), which is implemented using GEMPACK (Harrison and Pearson, 1996), together with Version 4 of the GTAP database, which is comprehensively documented in McDougall *et al.* (1998). GTAP is a relatively standard, multiregion, applied general equilibrium model that features explicit modelling of international transport margins, a global 'bank' that is designed for mediating between world savings and investment and a relatively sophisticated consumer demand system that is designed for capturing differential price and income responsiveness across countries. The latter is particularly important in the case of projections work. Throughout the paper we employ the simplifying assumptions of perfect competition and constant returns to scale in production activities.⁵ Validation efforts with this model (Gehlhar 1997; Coyle *et al.*, 1998) show that it is able to track some of the major changes in world trade patterns to a reasonable degree. However, Gehlhar's (1997) work showed that projections over a period of one decade were substantially improved by doubling the trade elasticities. This result has been supported by recent estimates by Hummels (2000), who estimated Armington elasticities comparable in magnitude to the doubled estimates. Accordingly, for this work we have doubled the size of the standard GTAP trade elasticities.

⁵ Alternative versions of the GTAP model feature imperfect competition (see Francois, 1998), but these are very demanding of additional information and unstable for projections purposes.

Overall rates of economic growth

Following earlier projections work with the GTAP model (Gehlhar *et al.*, 1994; Hertel *et al.*, 1996; Anderson *et al.*, 1997a,b; Arndt *et al.*, 1997), we assemble external projections for population, skilled and unskilled labour, investment and capital stock (see Table A1). When combined with assumptions about likely productivity growth rates, this permits us to predict the level and composition of GDP in 2005, as well as trade flows, input usage and a wide range of other variables. Our forecasts for these fundamental drivers of change over the 1995–2005 period are reported in Hertel *et al.* (1999). Historical and forecast data from the World Bank were combined in order to generate these projections. Cumulating the average growth rates between 1995 and the projected 2005 end-point provided the population and unskilled labour projections. The skilled labour projections, based on forecasts of the growth in the stock of tertiary educated labour in each developing country (Ahuja and Filmer, 1995) and projected growth rates of skilled labour in developed countries from the World Bank, provide an indication of changes in the stock of those qualified for employment as professional and technical workers. Growth rates of physical capital were obtained from 1995 and the projected 2005 stock of physical capital. Projections of the stock of physical capital were calculated using the Harberger-style perpetual inventory method, that is, by adding investment net of depreciation in order to update the capital stock in each year. Data for the initial physical capital stock for 1995 as well as annual forecasts of gross domestic investment were obtained from the World Bank.

Our projections of total factor productivity (TFP) growth vary by sector and region. Regions are grouped into four categories according to their assumed rate of annual productivity growth in manufactures. These range from low productivity growth (0.33% per year), to medium (1% per year) and high (2% per year), with a final category, very high (3%), reserved for China and Taiwan. The latter two countries seem to be growing at rates that cannot be explained by normal rates of productivity growth. Sectoral variation in productivity growth builds on the econometric work of Bernard and Jones (1996) and Martin and Mitra (2000). Bernard and Jones (1996) found that the annual rate of productivity growth in OECD agriculture over the period 1970–87 was approximately 40% faster than that of manufacturing. Similarly, services TFP growth was approximately half that in manufacturing, although they did not measure significant productivity growth in mining over this period. By combining these factors of proportion with the above-mentioned manufacturing TFP growth rates, we are able to obtain region/sector-specific productivity forecasts for the 1995–2005 period.

A difficult aspect of constructing such projections has to do with the rate at which natural resources are depleted or, perhaps, augmented through new discoveries. Rather than attempt to estimate changes in the natural resource

Table A1: *Projected Cumulative Percentage Growth Rates, 1995 to 2005 (Percentage Annual Growth Rates in Parentheses)*

Regions	Population	Unskilled labour	Skilled labour	Physical capital	TFP ^a
Namerica	11(1.05)	14(1.29)	39(3.33)	39(3.33)	low
Weurope	1(0.10)	0(0.03)	29(2.60)	9(0.83)	high
AusNZI	10(0.97)	11(1.09)	66(5.20)	20(1.84)	low
Japan	2(0.20)	-3(-0.29)	32(2.83)	4(0.37)	low
China	9(0.83)	12(1.17)	43(3.66)	139(9.08)	very high
Taiwan	8(0.73)	13(1.21)	51(4.18)	56(4.52)	very high
OthNIEs ^b	9(0.84)	8(0.73)	66(5.18)	23(2.09)	high
Indonesia	14(1.31)	21(1.96)	126(8.47)	20(1.82)	low
OthSEA	19(1.73)	26(2.36)	84(6.29)	33(2.87)	low
India	17(1.59)	23(2.11)	73(5.65)	116(8.01)	medium
OthSoAsia	23(2.10)	33(2.92)	77(5.87)	40(3.39)	medium
Brazil	13(1.26)	22(2.04)	70(5.46)	-7(-0.69)	high
OthLatAm	18(1.63)	23(2.11)	89(6.55)	27(2.41)	medium
Turkey	15(1.44)	22(2.02)	104(7.41)	35(3.06)	high
OthMENA	27(2.43)	37(3.17)	109(7.64)	11(1.07)	
EIT	3(0.27)	6(0.60)	69(5.37)	36(3.09)	low
SoAfrCU	23(2.06)	29(2.59)	162(10.11)	-1(-0.10)	low
OthSSA	33(2.87)	37(3.19)	88(6.50)	25(2.23)	medium
ROW	18(1.65)	21(1.90)	83(6.22)	50(4.15)	medium

Source: Hertel *et al.* (1999).

^aThe low, medium, high, and very high growth assumptions for TFP in manufacturing correspond to annual growth rates of 0.3, 1, 2 and 3%, respectively. TFP growth in other sectors is a multiple of this rate 1.4 (agriculture), 0.5 (services) and 0.0 (mining).

^bNamericam North America; Weurope, Western Europe; AusNZI, Australia/New Zealand; OthNIEs, other NIEs; OthSEA, other Southeast Asia; OthSoAsia, other South Asia; OthLatAm, other Latin America; OthMENA, other Middle East & North Africa; EIT, low economies in transition; SoAfrCU, South Africa Customs Union; OthSSA, other Sub-Saharan Africa; ROW, Rest of the world.

endowments over this period, we have simply opted to target a particular rate of change in the prices of agricultural and other natural resource-based commodities over the projections period. Grilli and Yang (1988) reported an average rate of price decline for metals in the twentieth century of approx-

imately 0.8% per year, while grain prices have fallen approximately 0.3% per year on average. We allow the model to select a rate of farmland and natural resource augmentation in agriculture and mining, which achieves a continuation of these downward trends in commodity prices throughout the 1995–2005 period.

In order to gauge the reasonableness of our projections, we compared our projected GDP growth rates over this period with those from the World Bank's Development Prospects Group. By and large they are quite close. This is hardly surprising, since the two studies share many of the same basic assumptions. Significant departures arise in the cases of the South Africa Customs Union, the economies in transition and Indonesia. In each case, our projected growth rates are substantially higher than the World Bank's. The only way the World Bank forecasts for these three regions could be achieved in our framework is to have negative productivity growth rates or substantial increases in unemployment. We have opted not to do either of these and so our forecasts are higher for these three regions. Our forecast for China's GDP growth is slightly higher than that of the World Bank. However, the difference is negligible when viewed in terms of annual growth rates.

Changes in Trade Policy

From the point of view of this paper, the most important trade policy developments over the 1995–2005 period are likely to be the completion of manufacturing tariff cuts under the Uruguay Round, implementation of the ATC and the accession of China and Taiwan to the WTO. We have incorporated these changes by drawing on the work of Francois and Strutt (1999) in order to specify the remaining Uruguay Round cuts to be made from our 1995 base period. China's WTO offer was obtained from the World Bank and is based on their offer as of August 1999. It is compared to their applied tariffs for 1997 and, where the bindings are lower, the offer is taken as a change in policy. Otherwise, the 1997 applied rates are used. Our treatment of Taiwan's offer is based on their announced target of 4% average tariffs for manufactures. We reduce all bilateral tariffs by an equi-proportionate amount that is sufficient to achieve this target in the updated database.

In the case of mining and manufactures protection, this approach does not generate large changes in tariffs for most regions. The exceptions are South Asia and China. However, the ATC is anticipated to have a large impact on trade as it implements accelerated growth of quotas established under the previous MFA, culminating in their abolition at the end of the Uruguay Round implementation period. China and Taiwan, as non-members of the WTO, remain constrained by the old MFA quotas. Thus, their accession brings important changes in the textiles and clothing trade. While it is unlikely that their accession will culminate in the complete elimination of China and

Taiwan's clothing quotas by the year 2005, we assume that this will follow soon after and that it will largely be complete before any cuts under a new WTO millennium round will take place. For this reason, we include their abolition in our baseline analysis as well.

Agriculture and services are more problematic. In the case of services, we believe that there is little in the Uruguay Round commitments that can be effectively quantified and so we have not implemented policy changes there. On the other hand, quite a bit of quantification has been undertaken for agriculture. It must be pointed out that our base year, 1995, represents a period of very high world prices and, therefore, low measured protection. In contrast, Uruguay Round commitments were made from a base period from the late 1980s when prices were very low and measured protection was at a historic high. In light of these facts and in light of the extensive 'dirty tariffication' in agriculture (Hathaway and Ingco, 1996; Ingco, 1996) we believe that the assumption of no change from 1995 protection in agriculture is sensible and we have implemented this in our baseline projections to 2005.⁶ As a result, the estimated average MFN tariff on food products by importer in 2005 shows the rest of the world, Japan, Taiwan and South Asia as all having very high rates of protection. Western Europe shows relatively low protection rates, since its intra-EU trade is very significant and not subject to tariffs. The agricultural exporting regions of Australia/New Zealand, Brazil and North America show the lowest tariff equivalents when averaged across all food products.

Structural Changes 1995–2005

The projected export orientation of manufactures rises over this period in most developing countries where the combination of deep tariff cuts and removal of the textile and apparel quotas results in a strong increase in the share of manufactures output destined for export markets. In contrast, agriculture, with no further substantial liberalisation over the projections period, becomes somewhat more inward oriented. The same is true of other primary industries, which were very outward oriented at the beginning of the projections period (1995). This is the result of relatively rapid growth in the developing countries, thereby fuelling the demand for basic raw materials. The rapid growth in developing countries over the projections period,

⁶ Since China and Taiwan's offers are not linked to the Uruguay Round base year, it would make sense to include their agricultural cuts in our baseline. However, we do not have solid estimates of their current protection rates and, at least in China's case, some of the bindings are clearly well above current protection levels. Therefore, we do not change their agricultural protection rates in the baseline simulation either.

coupled with relatively deeper cuts in import prices in several large developing countries, translates into a continuation of the trend towards increased importance of intradeveloping country trade. The trend towards increased reliance on manufacturing exports is also projected to continue. We project that, by 2005, nearly 45% of developing country merchandise exports will be to other developing countries and 80% of total developing country merchandise exports will be manufactures.