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The Uruguay Round and Net Food Importers

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### Abstract

This paper attempts to assess the incremental external financing requirements occasioned by changes in world food prices, due to implementation of the Uruguay Round Agreement on Agriculture, for a sample of 57 developing countries. Based on estimates of changes in food prices due to the Round obtained in previous studies, and on detailed data on food trade by country and commodity, the present study shows that the increase in net food import costs are likely to be smaller than 4 percent of net food imports over a period of six years for t e countries considered, although for some of the larger trading nations th. effect may exceed US$10 million.

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## Summary

The Uruguay Round Agreement on Agriculture established commitments on converting quantitative restrictions to tariffs, setting upper bounds on tariff rates for all agricultural items, lowering these bound rates over time, cutting export subsidies, and reducing overall support to agriculture (including domestic input and production subsidies), over a six-year implementation period. Export subsidy reductions by industrial countries that adhere to the commitments in the Round may raise world prices of some agricultural commodities by reducing the supply of exports to world markets. A ministerial decision contained in the Final Act of the Uruguay Round Agreement addresses this possible implication of the Round on net food-importing developing countries and discusses the possibility that such countries may need to draw upon the resources of the international financial institutions.

This paper asseses the implications of changes in world food prices owing to the Round for net food imports of developing countries, with a view to assessing whether additional external financing may be required. Previous studies have examined changes in world food prices attributable to the Round for broad groups of developing countries, but have analyzed separately only a few large developing countries. The present study analyzes further individual country effects by estimating changes in net food import costs for a sample of 57 developing countries for which the issue of higher food costs may be especially relevant, for each of four food categories (coarse grains, wheat, rice, and sugar).

Results show that changes in net food imports attributable to the Round are likely to be relatively small in percentage terms but may be substantial in absolute terms for some of the larger trading nations in the sample. In any event, effects would be felt only gradually within the six-year implementation period for agricultural liberalization. While some countries' net food import costs for the four commodity groups analyzed may actually fall as a result of the Round, since world prices of some food items (such as rice) are expected to decline, most countries in the sample are expected to pay more for food imports on net. The increases in the cost of net food imports for the four food categories covered are less than 4 percent for every country in the sample, although some large countries are expected to experience increases in net food import costs in excess of US$10 million. Even though small changes in food import costs may be important, especially for some smaller developing countries, the results obtained in this study suggest that the incremental financing needs occasioned by the Uruguay Round Agreement on Agriculture are likely to be modest.

# I. Introduction

The Uruguay Round agreement presents a wide range of opportunities to developing countries, stemming from liberalization of market access in goods and services and strengthening of multilateral trading rules and disciplines. While the changed world trading environment will present challenges as well as opportunities, developing countries that have undertaken substantial commitments to liberalize their own trade policy regime will be most likely to benefit from the Round, since this lowers import prices to consumers, improves resource allocation, and helps stimulate economic growth.

Liberalization commitments--especially reductions in subsidies--made by industrial countries in the Uruguay Round might lead to increases in world prices of some food products. This paper analyzes the impact of estimated changes in food prices due to the Uruguay Round Agreement on Agriculture for a wide variety of countries using highly disaggregated data on food trade. It focuses specifically on net imports of major food products by developing countries with large food trade deficits and a large share of food imports in total imports. For each of these countries, projections were made of how the cost of net imports of the sample of food products might be influenced by the Uruguay Round agreement. Using a country-by-country approach and highly disaggregated data by commodity, the analysis provides detailed insights into the ways that individual countries might be affected by rising food prices. It is important to stress, however, that losses on net food imports will be more than offset by gains from the Round in other areas for many developing countries, especially those undertaking substantial liberalization.

The integration of the agricultural sector into the WTO represents one of the most important achievements of the Uruguay Round negotiations. For decades trade in agriculture had been effectively exempted from most rules and disciplines of the General Agreement on Tariffs and Trade (GATT). 1/ With the implementation of the Uruguay Round agreement beginning in 1995,

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1/ While the GATT (1947) legally applied to the agricultural sector, in some instances it provided special treatment for agriculture, and its rules had been almost totally ineffective with respect to this sector. Since the U.S. government obtained a waiver to use nontariff barriers to restrict agricultural imports in 1955, it became common practice to treat agriculture as a special area. Also, it could be argued that the use of variable import levies under the European Community's (EC) Common Agricultural Policy (CAP) was consistent with the GATT in cases where tariffs were below bound rates, but clearly undermined the principles under GATT that tariffs should be used instead of tariff barriers. See Jackson (1989).

members of the World Trade Organization (WTO) agreed to phase out most exemptions from general GATT disciplines during the next six years. 1/

The de facto exemption of the agricultural sector from GATT disciplines had led to a situation in which almost all industrial countries were heavily protecting and subsidizing their domestic farm industries. The European Union (EU) and the United States, for example, protected their sugar markets so massively that in the early 1990s U.S. sugar prices were about double the free market price, and EU prices were even higher.

While trade liberalization generally tends to lower world market prices of the goods concerned, analysts expect a rise in the prices of some agricultural goods and declines in the prices of others due to the Uruguay Round because of very serious market distortions in this sector, including export subsidies. Declining export subsidies will discourage production of agricultural products in some industrial countries, especially in the European Union, and declining tariffs will at the same time increase demand in these markets for products from third countries. Both factors may lead to an increase in the cost of food imported by developing (and other) countries, or to reduced availability of food aid.

Concerns in this regard were already being expressed by a group of developing countries (Egypt, Jamaica, Mexico, and Peru) in the early phases of the negotiations and continued to the end. In a proposal to the Negotiating Group on Agriculture in 1988, this group expressed the view that food importing developing countries should not suffer from increased prices due to policy reforms and improved disciplines in developed countries. 2/ To meet these concerns Ministers finally agreed to include the *Decision on Measures Concerning the Possible Negative Effects of the Reform Program on Least-Developed and Net Food-Importing Developing Countries* 3/ in the Final Act of the Uruguay Round.

In this Decision, Ministers acknowledge that agricultural trade liberalization might lead to a decline in supply of food. In turn this may result in higher world food prices and a reduction in food aid. To mitigate the effects on net food-importing countries, the Ministerial Decision acknowledges that countries might in case of short-term difficulties in financing be eligible for additional resources from international financial institutions.

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1/ One important exemption from the general disciplines that will continue to exist is the allowance of domestic market supports and export subsidies.

2/ This group is sometimes called the W/74 Group or, as in this paper, the Group of Net Food Importers. At the time of the conclusion of the Uruguay Round it comprised Egypt, Jamaica, Mexico, Morocco, Nigeria, and Peru.

3/ For the complete text of the Decision see Appendix I.

There have been several studies based on regional country groupings and using global trade models, as well as some country studies, 1/ that assess how net food importing countries might be affected. Generally, both approaches indicate that the impact of increasing world food prices on import costs of net food-importing countries due to the Uruguay Round agreement are likely to be small. However, the severity of this effect on individual countries is still subject to considerable uncertainty. It is important to emphasize that recent increases in world food prices are due to factors unrelated to liberalization commitments undertaken in the context of the Round, such as crop failures and stock draw-downs, and hence these developments are not addressed in this paper.

The structure of the paper is as follows. Section II summarizes the main features of the Uruguay Round Agreement on Agriculture. Section III outlines and discusses various studies of the effect of this agreement on developing countries. Section IV provides a description of the methodology used in this paper and the empirical results. Section V considers the extent of food aid, and Section VI offers some conclusions. Readers familiar with the Uruguay Round Agreement on Agriculture and existing studies estimating its effects may wish to proceed directly to Section IV.

## II. Uruguay Round Agreement on Agriculture

Liberalization efforts of the Agreement on Agriculture can be assigned to three fields: market access, export subsidies, and domestic support. Regarding market access, the Agreement provides for important improvements in the transparency and predictability of trade policies through tariffication of all existing nontariff barriers and binding of all tariffs.

However, reductions in tariff levels are less likely to lead to a significant decrease in the overall level of protection, since the requirement of an unweighted average cut of 36 percent is applied to a high base, and leaves countries flexibility to shift cuts to products that are less sensitive to import competition so long as they fulfill the 36 percent average cut and minimum tariff cut of 15 percent on each item. Reductions have to take place in equal annual installments during the implementation period. In addition, countries agreed to increase minimum market access for imports from at least 3 percent in the year 1995 to at least 5 percent of domestic consumption at the end of the implementation period. 2/ The

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1/ See, inter alia, Shiells, Subramanian, and Uimonen (1996).
2/ Minimum market access provisions of the Uruguay Round Agreement on Agriculture aim to preserve a certain degree of market access even for items that may continue to face high levels of border protection. Access will be achieved using tariff quotas, whereby reduced tariff rates apply to imports within the quota and higher rates apply to imports beyond the quota level.

implementation period will last 6 years, from January 1, 1995 (the date on which the agreement entered into force) to December 31, 2000.

The point of reference for measures in the fields of market access and domestic support is the average level of protection that prevailed during 1986-88. For developing countries, in addition to several other special provisions, liberalization requirements were reduced by one third and the implementation period was extended to 10 years. Least developed countries do not have to commit to make any reductions, but they have to convert their nontariff barriers into tariffs.

The results regarding export subsidies are also partial in nature. Although the total value of subsidies on exports is to be reduced by the same percentage as tariffs, there is no minimum requirement on a product-by-product basis. In addition, volumes of subsidized exports have to be reduced by 21 percent for each product. This requirement might be more stringent than the required percentage reduction in the value of export subsidies because it applies on a product-by-product basis. Reductions in export subsidies are to be calculated from the average level of subsidization during the years 1986-90.

Commitments regarding the reduction of domestic support are not very ambitious either. Notwithstanding the agreement to reduce the total Aggregate Measure of Support (AMS) 1/ by 20 percent on average, numerous exemptions, such as "green box" measures 2/ or payments under production-limiting programs, allow countries to circumvent liberalization to a large extent.

There are several reasons why the actual extent of liberalization might be lower than it would have been if the percentage reductions stated in the Agreement on Agriculture had been applied to protection levels in the year 1994 on a product-by-product basis. Choosing a period of very high agricultural protection as a base reduces the need to liberalize in the future, to the extent that countries have reduced their protection since the base period. 3/ Also, many countries offered tariff bindings at levels

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1/ The Aggregate Measure of Support comprises measures such as market price support, non-exempt direct payments (payments dependent on a price gap), or other non-exempt policies (for instance, input subsidies or marketing cost reduction measures).

2/ Green box measures include certain government service programs, decoupled income support, social safety net programs, structural adjustment assistance, environmental programs, and regional assistance programs.

3/ During the base period 1986-88, world market prices for agricultural goods were very low, so that rates of protection (including variable levies) were very high.

well above applied tariffs. 1/  In these cases no effective liberalization
will occur.  Furthermore, as already noted above, the extent of reductions
in export and other subsidies is lessened by generous exemptions.  Table 1
shows that liberalization commitments will not lead to lower domestic prices
for most of the countries.

Table 1.  Estimates of Average Import Price Reductions from
Long-Run Average, 1982-1993 1/

(percentage changes)

| | Wheat | Rice | Coarse grains |
|---|---|---|---|
| European Union | -- | -- | -- |
| United States | -9 | -- | -- |
| Japan 2/ | -47 | ... | -55 |
| Australia | -1 | -9 | -- |
| Canada | -- | -- | -- |
| EFTA | -- | -8 | -- |
| Upper income Asia | -109 | -- | -78 |
| Indonesia | -- | -- | -- |
| India | -- | -- | -- |
| Low-income Asia | -- | -- | -- |
| Brazil | -7 | -- | -- |
| Mexico | -- | -- | -- |
| Other Latin America | -- | -- | -- |
| Nigeria | -15 | -- | -75 |
| Mediterranean | -- | -- | -- |
| Other Africa | -- | -- | -- |
| South Africa | -- | -- | -- |
| Maghreb | -- | -- | -- |

Source:  Ingco (1995), Table 6a, page 45.

1/  Estimated as change in the rate of protection divided by one plus
the initial protection rate.
2/  Since Annex 5 of the Uruguay Round Agreement on Agriculture allows
Japan to postpone its tariffication for the rice sector, price effects could
not be calculated.

1/  Since the Uruguay Round agreement did not demand any verification of
the tariffication process, many countries set their tariff bindings at very
high levels so that the level of protection even after a tariff reduction of
36 percent will not fall below the tariff equivalent of the former nontariff
barriers.

III. <u>Recent Empirical Studies</u>

Earlier attempts to quantify the possible effects of the Uruguay Round Agreement on Agriculture were first made while negotiations were still underway. Most of them were based on the anticipated results taken from the Draft Final Act, which was more ambitious regarding trade liberalization than the final agreement. 1/ However, some recent papers are based on the Final Act and individual countries' schedules of commitments. 2/ In spite of their very different approaches, almost all studies reveal only small price changes and welfare effects. 3/ Most of the studies emphasize that the extent to which countries gain is mainly determined by the extent of their own liberalization efforts.

Whereas almost all quantitative studies predict at least small welfare gains for most countries and the world as a whole, some concerns have been expressed regarding possible welfare losses that may be experienced by net food-importing developing countries due to rising food prices. Therefore, the following analyzes three recent studies that provide estimates of the global price changes resulting from the Uruguay Round Agreement on Agriculture. 4/ While the Page and Davenport (1994) and FAO (1995) studies provide estimated changes in world food prices due to the Round, the

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1/ The Draft Final Act included a higher percentage reduction in the volumes of export subsidies (24 percent instead of 21 percent). It did not provide exemptions from the reductions in domestic support for the large EU and U.S. farm support programs (U.S. deficiency payments and EU compensation payments) and demanded cuts in subsidy levels on a product-by-product basis instead of only establishing overall ceilings. In addition, the Final Act contains a special provision for EU and U.S. wheat producers that avoids large cuts in subsidies in the first years of the implementation period, which was not part of the Draft Final Act.

2/ See, for example, Food and Agriculture Organization (FAO) (1995) and Ingco (1995). The FAO and Ingco studies are both based on the Final Act, and on countries' actual schedules of tariff (and other) agricultural liberalization commitments. However, the Ingco study compares liberalization commitments in the country schedules with estimates of applied tariff rates to assess the extent of actual tariff liberalization agreed in the Round. This is important because the base period tariff rates included in the individual country schedules were often substantially higher than applied rates. The FAO study, in contrast, applies the 36 percent tariff cuts to the base period rates in the schedules, thereby overstating the extent of actual tariff liberalization.

3/ The United Nations Conference on Trade and Development (UNCTAD) (1995) provides estimates of the effects of the Agreement on Agriculture but these were based on the assumption that food import prices would be higher by 5 to 10 percent due to the Round, which was not derived from actual liberalization commitments in the Round.

4/ Related studies include GATT (1993), Harrold (1995), and Ingco (1995), but do not provide estimates of world price effects.

following discussion highlights especially the Goldin and van der Mensbrugghe (1995) study because it incorporates more accurate assumptions regarding the extent of agricultural tariff liberalization.

## 1.    Page and Davenport (1994)

The study by Page and Davenport (1994) is based on the Rural-Urban North-South Model (RUNS) of the OECD Development Center. It is especially well suited to model agricultural trade because 15 out of the 20 commodity sectors in the model pertain to agriculture. The model contains 22 regions. Each country consists of two sectors, urban and rural, a government, and two households, one in each sector. Supply is driven by technology and resource endowments, demand mainly by household incomes, and both are influenced by government policies. Constant returns to scale technology is assumed. Commodities included in different commodity sectors are imperfect substitutes for one another. Net exports of agricultural goods are given by the difference between domestic production and demand. Each agricultural product is a perfect substitute for the same product produced in another country (that is, agricultural products are homogeneous commodities internationally). 1/

Instead of using actual schedules of commitments for every country, the Page and Davenport study assumes implicitly that the average cut in tariffs and subsidies required by the Final Act of the Uruguay Round will be applied to all commodities. As the authors acknowledge, this will tend to overstate the extent of actual liberalization. In addition, some of the economically most important countries had already fulfilled almost all requirements of the agreement before January 1, 1995. A small bias in the opposite direction might stem from the assumption that there is full price transmission, since many developing countries use measures that dampen transmission of changes in world prices to domestic prices.

Despite the assumptions that lead to an overstatement of the price changes, the projected increases in world prices are quite modest, with an unweighted average over all commodities of 2.3 percent. The price increase is less than 1 percent for four out of eight commodities, less than 3 percent for two commodities, and exceeds 5 percent for only two products. 2/ Nonetheless, the study estimates that the trade effects of the liberalization of temperate agriculture will result in an increase in the cost of net imports of developing countries of about US$900 million, or 5 percent of their total net imports of temperate agricultural goods.

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1/  For a detailed description of the RUNS Model, see Goldin, Knudsen and van der Mensbrugghe (1993).

2/  Page and Davenport adjust the price change for sugar by one third, to 5.2 percent, because the reduction in subsidized exports will partly be offset by increased unsubsidized exports.

Table 2.  Temperate Agricultural Products, Price Changes
in the Base and Uruguay Round Simulations

(<u>percentage change</u>)

| | Change in prices, base run (no Uruguay Round) | Change in prices, (with Uruguay Round) | Difference |
|---|---|---|---|
| Wheat | -8.9 | -6.3 | 2.6 |
| Rice | 12.7 | 12.6 | -0.1 |
| Coarse grains | -27.3 | -26.4 | 0.9 |
| Sugar | -6.2 | 0.7 | 5.2 |
| Beef, sheep | 5.2 | 7.9 | 2.7 |
| Other meats | -1.9 | -2.4 | -0.5 |
| Oils | -12.8 | -12.5 | 0.3 |
| Dairy | 8.4 | 14.6 | 6.2 |

Source:  Derived from Page and Davenport (1994), Table 3.3, page 43.

## 2.    <u>Food and Agriculture Organization (FAO) (1995)</u>

The Food and Agriculture Organization (FAO) Committee on Commodity
Problems examined a paper, "Impact of the Uruguay Round on Agriculture," at
its sixtieth session in Rome, April 1995.  The study uses the World Food
Model, which is a dynamic partial equilibrium model that simultaneously
determines production, consumption, imports, exports and world prices, and
covers all countries supplemented by a number of single commodity models.
The FAO Secretariat projects developments in the agricultural sector through
the year 2000.

A baseline projection takes into account income growth, productivity
changes, demographic trends, and policy reform independent of the Uruguay
Round during this period under the assumption that trade liberalization
agreed in the Uruguay Round does not take place.  A second scenario adjusts
this projection for changes in the levels and forms of protection resulting
from the Uruguay Round Agreement on Agriculture.  For this purpose it is
assumed that changes in bound tariff rates, as specified in countries'
schedules of commitments, represent the actual degree of liberalization,
irrespective of current tariff levels; this likely overstates the extent of
liberalization, since applied rates were often substantially below the base
rates specified in the countries' schedules of commitments.  Changes in the
structure of protection also affect the elasticity of price transmission in
the model.  Minimum import access commitments and the reduction in the
subsidized volume of exports are also included.  In addition, it is assumed
that reductions in export subsidies will result in an increase in the

consumer price of the recipient country. The increased income due to the Uruguay Round was taken from the World Bank/OECD study. Finally, adjustments were made to take into account "to some extent the loss of preferential margins." 1/ Since reductions in domestic support are not product-specific, they were not incorporated into the FAO's analysis.

Simulation results indicate that the impact of the Uruguay Round on world agricultural production will be negligible. Appendix Tables 14 and 15 show that the decrease in subsidization of wheat in industrial countries slows down its production in these countries. Declining exports in turn encourage production in developing countries, and therefore they are able to substitute partially domestic production for imports.

All food prices were projected to be higher or unchanged due to the Uruguay Round, compared to the baseline scenario. As shown in Table 3, the percentage increases vary between 0 (oilmeal proteins) and 10 percent (pig meat and sheep meat) due to the Uruguay Round agreement. Price increases of the various types of cereals (the basic food import of most developing countries) lie in a range of 4 percent to 7 percent. Prices of wheat and other grains were projected to decline in the baseline (i.e., in the absence of the Round) but since the projected price increases due to the Uruguay Round were larger than the projected price decreases for the baseline, prices were projected to increase between 1987-89 and 2000.

While price increases would benefit food exporters, they would affect most developing countries adversely, since developing countries tend to be net food importers. The authors stress that the effects of the Round on individual countries stem primarily from the changes in domestic food prices. Thus, the impact of the Round on net food importers depends heavily on the extent to which changes in world market prices are reflected in domestic prices. Since many developing countries still employ have import barriers, governments may be able to mitigate the effects of increasing world food prices by reducing such barriers.

## 3. Goldin and van der Mensbrugghe (1995)

The study by Goldin and van der Mensbrugghe uses the RUNS model and the countries' actual offers of tariff and export subsidy reductions for the projections. It is based on work by Ingco (1995) which measures liberalization by calculating tariff reductions from actual applied rates. Goldin and van der Mensbrugghe model different scenarios regarding the degree of liberalization and the baseline period.

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1/ FAO (1995) page 3.

Table 3.  Change in International Food Prices
between 1987-89 and 2000

(percent)

|  | Base Line | Effect of the Uruguay Round | Total Change 1/ |
|---|---|---|---|
| Wheat | -3 | 7 | 4 |
| Rice | 7 | 7 | 15 |
| Maize | 3 | 4 | 7 |
| Millet/sorghum | 6 | 4 | 10 |
| Other grains | -3 | 7 | 5 |
| Fats and oils | -4 | 4 | -- |
| Oilmeal proteins | 3 | -- | 3 |
| Bovine meat | 6 | 8 | 14 |
| Pig meat | 3 | 10 | 13 |
| Sheep meat | 13 | 10 | 24 |
| Poultry | 5 | 8 | 14 |
| Milk | 32 | 7 | 41 |

Source:  FAO (1995), Table 2, page 11.

1/  Total does not necessarily equal the sum of the two effects.

Their first simulation assumes as a baseline that the level of protection until the year 2002 would be the same as the average level during the period 1982-93.  During the eighties there was a strong trend of increasing protection in agriculture in the developed countries, while in the second half of the decade many developing countries, especially in Latin America, made some efforts to liberalize their agricultural sectors.  The use of a long-run average as a base line serves to smooth these fluctuations.  They construct a scenario in which they assume that only the liberalization measures concerning border protection are implemented, while input subsidies remain unchanged (Scenario I).

Whereas Goldin and van der Mensbrugghe explicitly refer only to tariff reductions, the way border protection is modeled in the RUNS model implicitly covers the reductions of export subsidies as well.  To measure border protection, the RUNS model uses "price wedges," defined as the domestic price divided by the world price; this is influenced not only by tariffs but also by export subsidies.

Table 4.  Decomposition of Price Wedge Effects

| Price ratio | Net Importer | Net Exporter |
|---|---|---|
| pp/pw < 1 | Import Subsidies | Export Taxes |
| pp/pw > 1 | Import Tariffs | Export Subsidies |

Source:   Goldin and van der Mensbrugghe (1995) Table 1.4, page 43.

pp: domestic price; pw: world price.


Scenario II includes the same liberalization as Scenario I but compares this to a baseline in which the level of protection stays constant at the average level of 1991-93.

Scenario III is similar to Scenario II but includes reductions in input subsidies in the bundle of liberalization measures.  Unlike reductions in tariffs and in export subsidies, Goldin and van der Mensbrugghe do not use countries' actual offers but assume that the OECD countries reduce all input subsidies by 36 percent and non-OECD countries reduce all import subsidies by 24 percent, as specified in the agreement.

Scenario IV, in contrast, assumes that liberalization takes place as specified in the proposals of the Draft Final Act instead of referring to the Final Act and actual offers.  This allows a comparison with their earlier study (Goldin, Knudsen, and van der Mensbrugghe (1993), and sheds some light on the differences in the projected impacts obtained in earlier studies based upon the Draft Final Act and more recent ones based upon the Final Act.  Finally, Scenario V attempts to allow for the possibility that unemployment might have a strong influence on the outcomes.

As expected, the resulting changes in world prices and welfare differ substantially under the five scenarios.  However, the assumptions of Scenarios III-V appear unrealistic for several reasons.  Scenario III takes reductions of input subsidies into account, in addition to the tariff reductions assumed in Scenario II.  It therefore yields larger changes in prices and welfare levels.  Despite the fact that reductions of input subsidies are part of the Agreement on Agriculture, for reasons given above it is very unlikely that they will result in such high, if any, effective changes in input subsidies.

Scenario IV is mainly of historical value and was only calculated to show the difference between this and the earlier study, and Scenario V is subject to many caveats.  Therefore, the remainder of this paper will focus entirely on the first two scenarios, using Scenario I as a lower limit and Scenario II as an upper limit on the effects of the Uruguay Round.

Table 5.   Main Assumptions of Scenarios I to V

| Assumptions: | Scenario I | Scenario II | Scenario III | Scenario IV | Scenario V |
|---|---|---|---|---|---|
| Reference period | 1982-93 | 1991-93 | 1991-93 | 1991-93 | 1991-93 |
| Tariffication | Y | Y | Y | Y | Y |
| Tariff reductions | Y | Y | Y | Y | Y |
| Reductions of input subsidies | | | Y | Y | Y |
| Draft Final Act | | | | Y | |
| Unemployment | | | | | Y |

While the assumed post-Uruguay Round tariff levels are exactly the same in Scenarios I and II, price changes and welfare effects are much higher in Scenario II because tariff reductions 1/ are much larger in comparison to the baseline tariff level under this scenario.

Price changes under Scenario I are no greater than 1.7 percent for any of the commodity groups, and are often negative. Viewed in the context of the instability and secular movement in world commodity prices they are barely significant. Indeed, as Table 6 shows, prices of most of the commodities tend to decline in Scenario I. According to Goldin and van der Mensbrugghe (1995), these small negative price changes can be attributed to increased production of crops that remain relatively more protected than other crops, occupying land previously devoted to now less protected crops. Their estimated effects reveal that China and India, as large exporters, might suffer from lower rice prices while Mexico and sub-Saharan Africa, as net food importers, may have to face slightly higher net import costs due to higher cereals prices.

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1/  The terms "tariff reductions" or "tariff levels" are for the remainder of this section meant to include implicitly export subsidies as well.

Table 6.   Changes in World Agricultural Prices

(percentage deviations from benchmark levels in 2000)

|  | Scenario I | Scenario II |
|---|---|---|
| Wheat | 1.2 | 3.8 |
| Rice | -1.5 | -0.9 |
| Coarse grains | 0.1 | 2.3 |
| Sugar | -1.0 | 1.8 |
| Beef, veal, & sheep | 0.2 | 0.6 |
| Other meats | -0.9 | -0.6 |
| Coffee | -1.7 | -1.5 |
| Cocoa | -1.3 | -0.7 |
| Tea | -1.6 | -1.4 |
| Oils | -0.6 | -0.3 |
| Dairy | -1.3 | 1.2 |
| Other food products | -1.3 | -1.4 |

Source:   Goldin and van der Mensbrugghe (1995), Table 3, page 28.

The relatively stronger liberalization effects in Scenario II result in a larger drop in the supply of temperate foodstuffs, particularly of cereals, in the industrial countries.  But even in this scenario price changes stay in a quite narrow range of -1.5 percent to +3.8 percent. Global welfare rises because higher welfare levels in other developing countries and OECD countries more than offset modest losses in some African, Latin American, and low-income developing countries.

4.   Comparison of studies

Comparing the three surveyed studies reveals that projected changes in food prices are largest in the FAO (1995) study, and lowest in Scenario I of Goldin and van der Mensbrugghe (1995); these studies are summarized in Table 7.  The main reason for the stronger effects obtained in FAO (1995) is that it uses for its calculations the very high tariff levels in 1986-88 as a base from which tariff reductions are computed, rather than the applied rates in effect prior to the start of the Uruguay Round Agreement on Agriculture implementation period (January 1, 1995).  Therefore, the FAO (1995) study severely overstates the degree of liberalization, and in turn overstates the resulting price changes. 1/

1/  As has been shown in Table 1, effective changes in tariffs and, consequently, in prices are rare.

## Table 7. Summary of the Studies

| Study | Model | Assumptions | Results |
|-------|-------|-------------|---------|
| Page and Davenport | RUNS Model | Reduction in tariffs and subsidies as given in the agreement applies to all commodities. | Unweighted average price increase: 2.3 percent, largest effects on dairy products (6.2 percent) and sugar (5.2 percent). |
| FAO | World Food Model | Average reduction in tariffs and export subsidies as given in the countries' schedules; new tariff levels correspond to tariff ceilings, despite actual tariff levels. | Negligible effects on world food production, zero or positive price changes, largest effect on pig meat and sheep meat (10 percent), effects on net food import bills on average positive, modest losses for the regions Africa and Near East. |
| Goldin and van der Mensbrugghe | RUNS Model | See Table 5. | Scenario I:<br>Very modest price declines for most of goods, largest increase in wheat prices (1.2 percent), welfare changes less than 1 percent.<br><br>Scenario II:<br>Slightly higher price changes, largest increase in wheat prices (3.8 percent), welfare changes are less than 1 percent for all regions except Upper Income Asia (1.3 percent). |

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The most important difference between the studies by Goldin and van der Mensbrugghe (1995) and Page and Davenport (1994), with respect to changes in world food prices, is that the latter study utilizes changes in protection agreed in principle in the Uruguay Round Agreement on Agriculture but did not base such changes on countries' actual schedules of commitments and applied protection levels. The Goldin and van der Mensbrugghe (1995) study avoids the shortcomings of the other two studies in using the actual schedules of commitments while taking into consideration that reductions of high tariff bindings may not result in actual liberalization if the new bound tariff ceilings are higher than currently applied tariff rates.

## IV. Empirical Analysis of the Impact of Price Changes

Liberalization of agriculture as a result of commitments made in the Uruguay Round will lead to changes in world food prices as trade barriers and subsidies are gradually reduced over the six-year implementation period. Previous studies, discussed in Section III above, provide estimates of the long-run effects of the Round on world food prices, once the Agreement on Agriculture is fully implemented. Information on the balance of payments implications of these expected changes in world food prices for individual net food-importing developing countries is limited, however. To fill this gap, this section will use estimated price changes from Goldin and van der Mensbrugghe (1995), since this study employs more realistic estimates of the liberalization of agricultural trade barriers than other studies, 1/ to assess the implications of the Round empirically for a sample of 57 developing countries. The analysis provides projections for net food imports of four commodities (coarse grains, wheat, rice, and sugar) through the end of the six-year implementation period, focusing on the incremental effect of the Uruguay Round Agreement on Agriculture on the food import bills of the countries analyzed at the end of this period, in the year 2000. It should be stressed that the analysis does not attempt to assess the implications of the recent food price spike for balance of payments need for these countries, since this is unrelated to the Round.

This section first presents the methodology for projecting changes in net food imports in 2000 due to the Round, including the selection of countries and commodities for analysis, m n assumptions underlying the baseline projections for net imports over the medium term, and the

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1/ Goldin and van der Mensbrugghe compare Ingco's (1995) estimates of the ad valorem equivalents of agricultural tariff bindings specified by countries in their Uruguay Round commitment schedules, with rates of protection actually in effect prior to the start of the implementation period of the Agreement on Agriculture. This provides a more accurate picture of the true extent of liberalization than simply applying percentage reductions to the often very high bound rates specified in countries' commitment schedules, as was done for instance in the FAO (1995) study.

sensitivity of findings to changes in these assumptions. Following this, the empirical results will be presented, along with an analysis of how the outcome for a particular country depends upon the commodity composition of its food trade, and whether the country is a net exporter or a net importer of each commodity.

1. **Methodology**

Estimates of the impact of changes in world food prices due to the Round on net food imports for individual developing countries will be obtained by preparing a baseline projection for net food imports during 1994-2000, which incorporates the effects of agricultural trade liberalization agreed in the Round. Then, two alternative projections will be prepared based on the counterfactual assumption that agricultural trade liberalization due to the Round is absent. These two alternative projections differ in their specification of how much world food prices are expected to change as a result of the Round, and correspond to Scenarios I and II from the Goldin and van der Mensbrugghe (1995) study. 1/ Import and export volumes will be assumed unchanged as a result of trade liberalization under the Uruguay Round Agreement on Agriculture; as discussed below, this simplifies the analysis considerably but may impart an upward bias to the estimated changes in net food imports. Comparison of the baseline with each of the two alternative scenarios will provide a low and high estimate of the incremental effect of the Uruguay Round Agreement on Agriculture on net food imports for each developing country in the sample.

a. **Country/commodity sample**

To make the analysis manageable, it will be necessary to limit the number of countries included for analysis, as well as to focus on certain commodity groups. This paper includes projections for 57 net food importing and other developing countries for each of four commodity groups: coarse grains, wheat, rice, and sugar. While it would be possible to include additional countries and commodities in the sample, this would not appreciably alter the qualitative conclusions that would be derived from the analysis presented below.

Regarding the selection of countries, this was specified by starting with the Group of Net Food Importers described above, adding all countries

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1/ The low and high estimates of the price effects of the Uruguay Round Agreement on Agriculture differ in their specification of the height of trade barriers that are expected to prevail in the 1994-2002 period in the absence of the liberalization that is being undertaken as a result of the Round. Scenario I assumes that liberalization would remain at average levels during 1982-93, whereas Scenario II assumes liberalization would remain at the higher levels prevailing during 1990-93. Starting from a higher base, Scenario II features larger cuts in trade barriers and hence finds larger changes in world food prices as a result of the Round.

in sub-Saharan Africa, and supplementing this list by an additional five countries. The additional countries were selected according to the following criteria: (1) food imports were at least twice as large as food exports during 1993; (2) food imports accounted for at least 20 percent of merchandise imports during 1993; and (3) the country is an IMF member. 1/ While the country sample analyzed in the main body of the paper does not include any Asian or former Soviet Union (FSU) countries since food accounted for only a small proportion of total imports for these countries during 1993 (less than 20 percent), many of these countries import substantial amounts of food. Therefore, projections for seven additional Asian and FSU countries are included in Appendix II.

The commodities selected for analysis were chosen to reflect the composition of food imports by most net food-importing developing countries. 2/ Several other agricultural commodities, such as coffee, tea, and meat, were excluded. These other commodities represent important sources of foreign exchange earnings for many developing countries rather than imports for basic food requirements; inclusion of these commodities would therefore distort the analysis. The exact composition of the four food commodity groups was dictated by use of the FAO Trade Yearbook as the basic data source. 3/

b.    Projected effects of the Uruguay Round

A baseline projection for net food imports for each country during 1994-2000 will be constructed below for each of the four food commodities analyzed; this baseline incorporates the effects of the Uruguay Round Agreement on Agriculture. The baseline projection is only important for setting the levels of net food imports in the year 2000 for each country and commodity, which are then simply reduced by the percentage increases in world food prices due to the Uruguay Round Agreement on Agriculture obtained by Goldin and van der Mensbrugghe in Scenarios I and II. While the U.S. dollar changes in net food imports will be influenced to some extent by the specification of the baseline projections, percent changes in net import values due to the Round will not; percent changes in net food imports will

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1/ Out of the Group of Net Food Importers only Egypt would be included in the sample defined by these criteria; out of the group of sub-Saharan African countries, only 12 would meet these criteria.

2/ The four products accounted for 15 to 84 percent of total food imports in 1993 for the 57 countries in the sample, or 47 percent on average.

3/ The main alternative source of food export and import data is the United Nations commodity trade statistics. These only take into account the amounts reported to the customs authorities, which may result in under-recording of food aid, and do not provide recent data for many developing countries.

be equal to the percent changes in world food prices, under the assumption that trade volumes would be unaffected by the Round. 1/

Separate projections for 1994-2000 will be made for exports and imports of each commodity group for each country. These will be based on data on export and import values and volumes by commodity and country for 1993 (the latest year for which data are available) from FAO (1994). 2/ Unit values will be computed by taking the ratio of value and volume.

Starting from 1993 unit values, import and export prices will be projected based on commodity price projections prepared jointly by the Research Departments of the Fund and the World Bank in connection with the World Economic Outlook exercise; these latter commodity price projections, as well as projections of economic growth used below, will be referred to as the "WEO projections." 3/

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1/ The assumption that trade volumes are unaffected by trade liberalization due to the Uruguay Round Agreement on Agriculture may impart an upward bias to estimated changes in net food imports. An increase in world cereals prices, for instance, will tend to reduce demand for imports and increase export supply.

2/ Wheat comprises wheat and wheat flour in wheat equivalent (SITC 041/046). Coarse grains (SITC 043, 044, 045.1, 045.2, 045.9, 048.2) are calculated as cereals minus wheat and wheat flour and rice (SITC 042) and sugar is defined as refined sugar (SITC 061.2).

3/ The commodity price projections prepared in April 1995 will be used for the analysis in this paper, since these were available when the estimates and projections contained in this paper were originally prepared. The WEO commodity price projections were updated in October 1995. The October 1995 update reflects the recent sharp increases in world wheat prices (US$ per metric ton):

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|
| April: | 150 | 144 | 138 | 141 | 142 | 144 | 145 |
| October: | 150 | 176 | 185 | 160 | 142 | 144 | 146 |

However, price projections in the year 2000 did not change appreciably from the earlier April 1995 forecast. Since this paper reports only the results of projections in the year 2000, these results would not change appreciably if the October 1995 WEO projections were used instead of the April 1995 projections. For instance, under Scenario II, the total change in net imports of the four food categories analyzed for all 57 countries in the main paper, plus the change for the 12 low-income food deficit Asian and FSU countries analyzed in Appendix II, would fall from US$523 million based on the April 1995 price projections, to US$520 million based on the October 1995 projections. Detailed revised projections based on the October 1995 projections are therefore not reported in this paper.

Trade volumes will be projected to grow in line with demand. Import volume will be projected to grow in line with economic activity in developing countries, based on the WEO projections. Export volume was equal to zero for many country/commodity combinations in the sample during 1993. In these instances, export volumes will be set equal to zero for the entire projection period. If exports were positive in 1993, export volume will be projected to grow in line with economic activity in partner countries. For many developing countries, the most important trading partners are the industrial countries. Accordingly, export volume will be projected to grow in line with economic activity in the industrial countries, again based on the WEO projections. For some developing countries with substantial exports to other developing countries, this may understate export growth since developing countries are projected to grow more quickly than the industrial countries. In any event, food exports were very small during 1993 for the developing countries and commodities considered, so the potential for understatement is small.

Given the baseline path of net food imports during 1994-2000, the incremental effect of the Uruguay Round Agreement on Agriculture will be estimated by reducing net food imports by the percentage changes in world food prices obtained by Goldin and van der Mensbrugghe (1995) in Scenarios I and II, which were displayed in Table 6. The latter study and its various scenarios were extensively discussed in Section III.3 above, along with the rationale for focusing exclusively on Scenarios I and II.

The changes in world commodity prices that will be incorporated into the projections are shown in Table 8. To illustrate, under Scenario I, the cumulative increase in world wheat prices during 1994-2000 absent the Round would be 2.0 percent; this represents the percentage change in price between 1993 and 2000 absent the Round. The incremental effect of the Round under Scenario I would be to increase wheat prices by 1.2 percent between 1993 and 2000; world wheat prices are expected to increase by an additional 1.2 percentage points between 1993 and 2000 due to the Round. The total change (including the effects of the Round) in wheat prices would then be 3.2 percent.

Under Scenario II, world wheat prices are projected to fall by 0.6 percent during 1994-2000 absent the Round. The effects of the Agreement on Agriculture are expected to increase world wheat prices by 3.8 percentage points under Scenario II. Including the effects of the Round, world wheat prices are projected to increase by a total of 3.2 percent over the 1994-2000 period.

## 2. Results

A comparison of baseline and counterfactual scenarios (Scenarios I and II) for the 57 developing countries analyzed shows that increases in net food import costs expected to result from implementation of the Uruguay Round Agreement on Agriculture accounted for only a small proportion (less than 5 percent) of net food imports, although the absolute amounts were

Table 8.   Price Changes during 1994-2000, with and without
the Impact of the Uruguay Round

(percentage changes)

| | Scenario I | | Scenario II | | Baseline Scenario |
|---|---|---|---|---|---|
| Product | Price changes during 1994-2000 without the Round | Incremental effect of the Uruguay Round | Price changes during 1994-2000 without the Round | Incremental effect of the Uruguay Round | Price changes during 1994-2000 with the Round |
| Wheat | 2.04 | 1.2 | -0.56 | 3.8 | 3.24 |
| Rice | 22.37 | -1.5 | 21.77 | -0.9 | 20.87 |
| Cereals (Coarse grains) | 9.29 | 0.1 | 7.09 | 2.3 | 9.39 |
| Sugar | 31.74 | -1.0 | 28.94 | 1.8 | 30.74 |

Source:   Goldin and van der Mensbrugghe (1995), Table 3, page 28, and staff estimates.

considerable for a few of the larger countries. A summary of the main results is presented in Table 9 for Scenario II, since this scenario provides an upper bound on the likely effects. Detailed results for Scenarios I and II are contained in Appendix Tables 16 and 17. Appendix II contains results for an additional seven Asian and FSU countries that were not selected for inclusion in the sample of 57 countries but nonetheless import substantial amounts of cereals.

The most striking result is that the relative changes in net food imports due to the Round were small, with increases in food import costs ranging up to 4.0 percent of net food imports for Ethiopia. As a percentage of gross food imports (including all food except fish), the percentage increases were even smaller, ranging up to 2.7 percent for Ethiopia. These results stem from the modest increases in world food prices that are expected to result from agricultural trade liberalization, as discussed previously (Table 8).

In U.S. dollar terms, and measured following full implementation of the Agreement on Agriculture in the year 2000, effects were substantial for several of the larger food importers (Albania, Algeria, Egypt, Ethiopia, Morocco, Mexico, Nigeria, Peru, and Yemen), albeit small in percentage terms. For these countries, the increase in net food imports exceeded US$10 million, measured at trade prices and volumes expected to prevail in the year 2000.

Estimated effects of the Agreement on Agriculture were even smaller under Scenario I, since this included smaller price increases than under Scenario II (Table 8). Under this scenario, only Algeria and Egypt face increases in net food import costs in excess of US$10 million, although these represent small percentage changes (less than 1 percent of net food imports). In fact, since prices of rice and sugar are both expected to fall as a result of the Round under Scenario I, 38 of the 57 countries are expected to benefit from the price changes due to the Uruguay Round Agreement on Agriculture.

Table 10 provides some examples that illustrate how the commodity composition of net food imports influenced the estimated effects of changes in food prices due to the Round. Under Scenario I, prices of wheat and coarse grains are expected to rise due to the Round, while prices of rice and sugar are expected to decline. Algeria is projected to be a net importer of each of the four commodities in the year 2000, but net imports of wheat are projected to be much larger than net imports of the other three commodities. Accordingly, the increase in net wheat imports more than offset the decreased net imports of rice and sugar, so the cost of Algeria's net food imports in these four commodities rose.

Egypt is also expected to be affected primarily by the wheat price increase due to the Round. However, Egypt is projected to remain a net exporter of rice, so a price drop would reduce the value of its exports, which is shown by the increase in (negative) net imports of Egyptian rice.

Table 9.   Impact of the Uruguay Round on Food Imports,
Assuming Price Changes in Scenario II

| | Uruguay Round Scenario - Scenario II, total (in millions of dollars) | Relative Change: 1/ (Sum/Net Food Imports) (percent) | Relative Change: 2/ (Sum/Food Imports) (percent) |
|---|---|---|---|
| Algeria | 56.05 | 3.69 | 1.53 |
| Angola | 2.49 | 1.54 | 0.54 |
| Benin | 1.05 | 1.22 | 0.58 |
| Botswana | 1.29 | 1.90 | 0.32 |
| Burkina Faso | -0.12 | -0.18 | -0.09 |
| Burundi | 0.37 | 3.31 | 1.01 |
| Cameroon | 2.07 | 2.71 | 0.86 |
| Cape Verde | 0.41 | 1.39 | 0.59 |
| Central African Republic | 0.45 | 3.50 | 0.93 |
| Chad | 0.57 | 2.14 | 1.71 |
| Comoros | -0.01 | -0.05 | -0.03 |
| Congo | 1.67 | 2.49 | 0.73 |
| Côte d'Ivoire | 0.78 | 0.27 | 0.13 |
| Djibouti | 0.35 | 1.41 | 0.41 |
| Egypt | 58.08 | 3.84 | 1.85 |
| Equatorial Guinea | 0.04 | 0.87 | 0.23 |
| Ethiopia 3/ | 12.56 | 3.98 | 2.72 |
| Gabon | 0.47 | 1.10 | 0.21 |
| Gambia, The | 1.21 | 1.35 | 0.89 |
| Ghana | 4.08 | 1.80 | 1.07 |
| Guinea | 1.20 | 0.81 | 0.49 |
| Guinea-Bissau | -0.27 | -0.78 | -0.60 |
| Kenya | 5.10 | 3.06 | 1.38 |
| Lesotho | 1.36 | 2.69 | 0.66 |
| Liberia | -0.64 | -0.73 | -0.47 |
| Madagascar | 0.81 | 2.74 | 0.98 |
| Malawi | 4.72 | 2.66 | 2.09 |
| Mali | 0.99 | 1.51 | 0.72 |
| Mauritania | 2.77 | 2.15 | 1.35 |
| Mauritius | 0.98 | 1.40 | 0.30 |
| Morocco | 29.35 | 3.85 | 1.91 |
| Mozambique | 3.69 | 1.99 | 1.26 |
| Namibia | 1.88 | 2.28 | 0.98 |
| Niger | 1.07 | 1.33 | 0.74 |
| Nigeria | 18.98 | 2.26 | 1.25 |
| Rwanda | 1.02 | 2.54 | 0.88 |
| São Tomé and Príncipe | 0.08 | 1.45 | 0.79 |
| Senegal | 1.46 | 0.60 | 0.25 |
| Seychelles | 0.14 | 1.25 | 0.29 |
| Sierra Leone | -0.07 | -0.09 | -0.04 |
| Somalia | 1.61 | 1.52 | 1.18 |
| South Africa | 0.28 | 0.13 | 0.02 |
| Sudan | -0.76 | -2.26 | -0.23 |
| Swaziland | 0.05 | 0.59 | 0.04 |
| Tanzania | 0.78 | 0.88 | 0.44 |
| Togo | 0.45 | 2.21 | 0.78 |
| Uganda | 0.05 | -6.58 | 0.07 |
| Zaïre | 2.27 | 2.10 | 0.77 |
| Zambia | 2.15 | 2.96 | 1.74 |
| Zimbabwe | 3.66 | 2.53 | 1.15 |
| Haiti | 2.96 | 1.55 | 0.88 |
| Jamaica | 3.42 | 2.13 | 0.83 |
| Mexico | 36.75 | 2.70 | 0.46 |
| Peru | 16.51 | 2.20 | 1.31 |
| Yemen | 21.31 | 2.87 | 1.82 |
| Albania | 10.13 | 3.37 | 2.08 |
| Kiribati | 0.03 | 0.56 | 0.21 |

1/   Sum of changes in net food imports divided by total net food imports in 2000 (Uruguay Round Scenario).
2/   Sum of changes in net food imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/   1992 Data.

Table 10. Changes in Net Food Imports in the Year 2000 due to the Uruguay Round

| | Uruguay Round Scenario - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 0.44 | 14.80 | -0.47 | -0.60 | 14.16 | 1520.10 | 0.93 | 3656.53 | 0.39 |
| Egypt | 0.48 | 14.39 | 1.00 | -1.43 | 14.44 | 1514.28 | 0.95 | 3139.55 | 0.46 |
| South Africa | -0.22 | 2.51 | -4.06 | 0.13 | -1.64 | 220.27 | -0.75 | 1679.66 | -0.10 |
| Sudan | -0.08 | 0.97 | -1.47 | 0.58 | -0.01 | 33.58 | -0.03 | 334.34 | -- |

| | Uruguay Round Scenario - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 9.70 | 45.58 | -0.28 | 1.05 | 56.05 | 1520.10 | 3.69 | 3656.53 | 1.53 |
| Egypt | 10.65 | 44.34 | 0.60 | 2.49 | 58.08 | 1514.28 | 3.84 | 3139.55 | 1.85 |
| South Africa | -4.79 | 7.72 | -2.43 | -0.22 | 0.28 | 220.27 | 0.13 | 1679.66 | 0.02 |
| Sudan | -1.85 | 2.98 | -0.88 | -1.00 | -0.76 | 33.58 | -2.26 | 334.34 | -0.23 |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

More generally, developing countries may experience terms of trade losses as a result of reductions in world agricultural prices due to the Round.

In the case of South Africa, the beneficial effects of reductions in the world price of rice more than offsets the higher cost of wheat imports due to the Round, so that South Africa is expected to pay less for its food imports on net under Scenario I. This conclusion is reversed in Scenario II, however, due to the increased cost of net wheat imports.

Sudan is expected to benefit slightly on net from changes in food prices due to the Round. In Scenario I, expected lower rice prices dominate higher wheat prices so that net food import costs are projected to fall. In Scenario II, the effects of higher wheat prices were offset by increases in prices of coarse grains and sugar, both of which Sudan exports.

These results show that concerns regarding the potential adverse effects of higher world food prices on net food-importing developing countries appear to have been overstated. Even under the more adverse price scenario, the incremental effect of the Uruguay Round Agreement on Agriculture following its full implementation did not increase net food imports by more than 4 percent for any of the 57 countries analyzed. While this amounted to more than US$10 million in several cases, the effects of the Round would be felt only gradually over time as liberalization is phased in over the six-year implementation period. For the seven Asian and FSU countries analyzed in Appendix II, estimated increases in net food imports exceeded US$10 million in all but one country, but this constituted less than 2 percent of total food imports.

## V.  Food aid

Many net food-importing developing countries receive substantial cereals grants, so that estimated increases in net food import costs presented in Section IV above should be adjusted downwards by deducting the amount of food aid. In doing so, account should be taken of the possibility that the implementation of the Uruguay Round Agreement on Agriculture may adversely influence the availability of food aid by reducing food stocks in the industrial countries. Since the Round is likely to lead only to small changes in prices, the negative impact on food stocks is unlikely to be large. This section discusses food aid in connection with the Round, although only limited information is available concerning each country.

Cereals account for roughly 90 percent of food aid. 1/ It is difficult to obtain reliable estimates of food aid as a proportion of total cereals imports. The value of food aid is assessed at prices prevailing in donor countries, which typically exceed prices in recipient countries' markets. Food import data are partly based on customs records; these data

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1/  See Canada (1994), p. 6.

typically record only a portion of food aid. For both of these reasons, the ratio of food aid to total food imports based on existing data may be overstated, leading in some cases to ratios in excess of 100 percent. Notwithstanding these biases, Table 11 provides rough estimates of the shares of food aid in total cereals imports for 53 of the countries analyzed in Section IV above. 1/ Food aid accounted for over 20 percent of total cereals imports in 28 of the 53 countries, with the share over 50 percent in 15 countries.

Regarding the impact of the Uruguay Round Agreement on Agriculture on the availability of food aid, it is important to distinguish the potential effects over the medium term, once the Agreement has been implemented, from the present tight world supply situation. Presently, world market prices for wheat and coarse grains are high and stocks are low, due to factors unrelated to the Round, including notably poor growing seasons in the United States, China, and Russia, and drought-induced production shortfalls in portions of Africa. 2/ However, as the provisions of the Agreement on Agriculture are implemented over a six-year period, subsidy reductions especially by industrial countries may reduce production, lower food stocks, and limit food aid. Since food aid accounts for a small proportion of cereals stocks, 3/ declining stocks do not necessarily imply proportional declines in food aid. Also, the extent of reductions in food stocks due to the Round may not be large even over the medium term, judging from the small estimated price changes obtained by Goldin and van der Mensbrugghe (1995) and discussed in Section III.3 above.

## VI. Conclusions

During the Uruguay Round developing countries expressed concern regarding effects of the Agreement on Agriculture on food import bills. This study attempted to estimate how much net food import costs would rise by the end of the six-year implementation period for 57 countries in each of four product groups (coarse grains, wheat, rice, and sugar). The estimated effects were obtained by forming a medium-term projection of net food imports that incorporated the effects of the Agreement on Agriculture, and then comparing this with an alternative projection that did not incorporate agricultural liberalization commitments specified under the Agreement. These projections were formed for each country and commodity in the sample, using food trade data from the FAO, medium-term projections of commodity prices and demand growth prepared by Fund staff in connection with the WEO exercise, and estimated effects of the Agreement on Agriculture on world food prices contained in Goldin and van der Mensbrugghe (1995).

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1/ Data on food aid were unavailable for the remaining four countries.
2/ FAO (1995).
3/ Food aid represented only 8.4 percent of cereal stocks in developed countries during 1992, according to Canada (1994).

Table 11.  Food Aid in Cereals by Recipient and Commodity Type, 1993

(tons)

| | Food aid | | | | | Total volume of cereals imports | Food aid, total cereal imports (percent |
|---|---|---|---|---|---|---|---|
| | Wheat and wheat flour | Rice | Coarse Grains | Blended, fortified | Sum | | |
| Algeria | 6615 | 4548 | 3015 | -- | 14,178 | 5,821,300 | 0.2 |
| Angola | 4290 | 7865 | 68,628 | 6264 | 87,047 | 345,700 | 25.2 |
| Benin | 3000 | 4360 | 18,436 | 1108 | 26,904 | 134,000 | 20.1 |
| Botswana | -- | -- | 7140 | -- | 7140 | 132,900 | 5.4 |
| Burkina Faso | 2000 | 2914 | 26,350 | -- | 31,264 | 120,800 | 25.9 |
| Burundi | 2248 | 2350 | 545 | -- | 5144 | 21,900 | 23.5 |
| Cameroon | -- | -- | -- | -- | -- | 280,700 | -- |
| Cape Verde | 3403 | 5611 | 32,983 | 605 | 42,602 | 52,700 | 80.8 |
| Central African Republic | -- | 36 | 8381 | -- | 8417 | 32,200 | 26.1 |
| Chad | -- | -- | -- | 385 | 385 | 58,800 | 0.7 |
| Comoros | -- | 4150 | 274 | -- | 4424 | 46,100 | 9.6 |
| Congo | 740 | 13,237 | -- | -- | 13,977 | 148,400 | 9.4 |
| Côte d'Ivoire | -- | 38,396 | 21 | -- | 38,417 | 590,400 | 6.5 |
| Djibouti | 10,733 | 5222 | 9946 | 932 | 26,832 | 42,600 | 63.0 |
| Egypt | 464,441 | 843 | -- | -- | 465,284 | 7,205,600 | 6.5 |
| Equatorial Guinea | 2851 | 1927 | -- | -- | 4778 | 11,100 | 43.0 |
| Ethiopia 1/ | 1,020,891 | 770 | 69,095 | 26,741 | 1,117,497 | 1,047,400 | 106.7 |
| Gambia, The | 487 | 4876 | -- | 3236 | 8599 | 86,800 | 9.9 |
| Ghana | 39,726 | 19,036 | 4014 | 6289 | 69,065 | 396,200 | 17.4 |
| Guinea | -- | 43,634 | -- | 123 | 43,757 | 335,300 | 13.1 |
| Guinea-Bissau | 1727 | 7486 | -- | 370 | 9583 | 70,200 | 13.7 |
| Kenya | 161,785 | 7236 | 149,936 | 22,495 | 341,452 | 569,000 | 60.0 |
| Lesotho | 10,000 | -- | 31,870 | -- | 41,870 | 130,800 | 32.0 |
| Liberia | -- | 148,167 | -- | 16,240 | 164,407 | 137,500 | 119.6 |
| Madagascar | 15,129 | 6028 | 1718 | 3955 | 26,830 | 110,500 | 24.3 |
| Malawi | -- | -- | 646,772 | -- | 646,772 | 514,500 | 125.7 |
| Mali | 19,653 | -- | 11,009 | -- | 30,662 | 83,500 | 36.7 |
| Mauritania | 49,710 | 5872 | 23,290 | 2029 | 80,901 | 285,700 | 28.3 |
| Mauritius | 1792 | -- | -- | 89 | 1880 | 239,800 | 0.8 |
| Morocco | 149,293 | 210 | 6270 | -- | 155,773 | 3,652,500 | 4.3 |
| Mozambique | 73,270 | 66,003 | 830,477 | 13,024 | 982,774 | 507,200 | 193.8 |
| Namibia | 10,000 | -- | 17,891 | -- | 27,891 | 141,000 | 19.8 |
| Niger | -- | 1269 | 18,660 | 1838 | 21,767 | 136,400 | 16.0 |
| Rwanda | 2763 | 2605 | 119,652 | 672 | 125,691 | 114,500 | 109.8 |
| São Tomé & Príncipe | 1174 | 2936 | 1734 | 1222 | 7066 | 9100 | 77.6 |
| Senegal | 12,382 | 31,860 | 3687 | -- | 47,929 | 579,000 | 8.3 |
| Sierra Leone | 13,813 | 9504 | -- | 3365 | 26,682 | 136,300 | 19.6 |
| Somalia | 113,007 | 109,376 | 102,811 | 8414 | 333,608 | 277,600 | 146.6 |
| South Africa | -- | -- | -- | -- | -- | 2,275,400 | -- |
| Sudan | 194,289 | -- | 133,745 | 462 | 328,496 | 627,000 | 52.4 |
| Swaziland | -- | -- | 18,581 | 2419 | 21,000 | 55,200 | 38.0 |
| Tanzania | 2000 | 14,363 | 22,728 | -- | 39,091 | 214,900 | 18.2 |
| Togo | 6328 | 72 | 2027 | 1517 | 9945 | 62,700 | 15.9 |
| Uganda | 11,222 | 278 | 58,612 | 31 | 70,143 | 75,800 | 92.5 |
| Zaïre | -- | 2076 | 25,131 | -- | 27,207 | 237,600 | 11.5 |
| Zambia | 32,805 | 2000 | 747,048 | 7650 | 789,503 | 352,800 | 223.8 |
| Zimbabwe | 112,183 | 8470 | 798,257 | 1340 | 920,250 | 538,400 | 170.9 |
| Haiti | 37,128 | 4971 | 9249 | 27,747 | 79,095 | 380,600 | 20.8 |
| Jamaica | -- | 40,095 | 172,462 | -- | 212,557 | 428,600 | 49.6 |
| Mexico | -- | 250 | 42,413 | 404 | 43,067 | 6,222,700 | 0.7 |
| Peru | 237,746 | 16,801 | 54,454 | 23,485 | 332,486 | 1,920,400 | 17.3 |
| Yemen | 79,526 | 18,003 | 3680 | -- | 101,209 | 1,843,400 | 5.5 |
| Albania | 534,705 | 12,270 | 18 | -- | 546,993 | 646,600 | 84.6 |

Source:  WFP (1993) and FAO (1994)

1/  1992 data.

Results obtained in this paper indicate that the impact of higher world food prices due to the Round should be modest in percentage terms, although effects may be more significant in dollar terms for several of the larger net food-importing countries. Estimated increases in net food imports of over US$10 million were obtained for Egypt, Algeria, Mexico, Morocco, Yemen, Nigeria, Peru, Ethiopia, and Albania. Estimated percent changes in net food imports of these four food items were small, ranging up to 4.0 percent for Ethiopia. As a percent of gross food imports (including all food except fish), changes were even smaller, ranging up to 2.7 percent for Ethiopia. Though small in percentage terms, the effects of higher world food prices due to the Round will likely be felt only gradually as liberalization is phased in over the six-year implementation period. Further, these estimates may overstate the impact of the Uruguay Round Agreement on Agriculture on the net food import bills of developing countries, since they were constructed to represent an upper bound on the likely effects. In particular, many developing countries obtain a substantial amount of food in the form of aid, which should be deducted from the estimated changes in net food imports to obtain estimates of incremental financing needs.

In response to concerns expressed by developing countries, the Uruguay Round agreement included a decision that recognized the possibility that certain developing countries may experience short-term difficulties in financing normal levels of commercial food imports, and that these countries may be eligible to draw on the resources of international financial institutions under existing facilities, or such facilities as may be established in order to address such financing difficulties. The results of this study should assist in allaying these concerns. The estimated financing needs appear modest and can be met under existing IMF facilities in conjunction with resources from other multilateral and bilateral agencies.

## FINAL ACT EMBODYING THE RESULTS OF THE
### URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS
(Marrakesh, April 15, 1994)

### DECISION ON MEASURES CONCERNING THE POSSIBLE NEGATIVE EFFECTS OF THE REFORM PROGRAM ON LEAST-DEVELOPED AND NET FOOD-IMPORTING DEVELOPING COUNTRIES

1.    *Ministers recognize* that the progressive implementation of the results of the Uruguay Round as a whole will generate increasing opportunities for trade expansion and economic growth to the benefit of all participants.

2.    *Ministers recognize* that during the reform program leading to greater liberalization of trade in agriculture least developed and net food-importing developing countries may experience negative effects in terms of the availability of adequate supplies of basic foodstuffs from external sources on reasonable terms and conditions, including short-term difficulties in financing normal levels of commercial imports of basic foodstuffs.

3.    *Ministers* accordingly *agree* to establish appropriate mechanisms to ensure that the implementation of the results of the Uruguay Round on trade in agriculture does not adversely affect the availability of food aid at a level which is sufficient to continue to provide assistance in meeting the food needs of developing countries, especially least developed and net food-importing developing countries.   To this end *Ministers agree*:

    (i)   to review the level of food aid established periodically by the Committee on Food Aid under the Food Aid Convention and to initiate negotiations in the appropriate forum to establish a level of food aid commitments sufficient to meet the legitimate needs of developing countries during the reform program;

  (ii)   to adopt guidelines to ensure that an increasing proportion of basic foodstuffs is provided to least developed and net food-importing countries in fully grant form and/or on appropriate concessional terms in line with Article IV of the Food Aid Convention;

(iii)   to give full consideration in the context of their aid programs to requests for the provision of technical and financial assistance to least developed and net food-importing developing countries to improve their agricultural productivity and infrastructure.

4.    *Ministers* further *agree* to ensure that any agreement relating to agricultural export credits makes appropriate provision for differential treatment in favor of least-developed and net food-importing developing countries.

5.   *Ministers recognize* that as a result of the Uruguay Round certain developing countries may experience short-term difficulties in financing normal levels of commercial imports and that these countries may be eligible to draw on the resources of international financial institutions under existing facilities, or such facilities as may be established, in the context of adjustment programes, in order to address such financing difficulties.   In this regard Ministers take note of paragraph 37 of the report of the Director-General of the GATT (MTN.GNG/NG14/W/35) on his consultations with the Managing Director of the International Monetary Fund and the President of the World Bank .

6.   The provisions of this Decision will be subject to regular review by the Ministerial Conference, and the follow-up to this Decision shall be monitored, as appropriate, by the Committee on Agriculture.

### Implications of Higher World Food Prices
### for Low-income Food-deficit Asian and FSU Countries

Since the country sample considered in the paper did not include any Asian or former Soviet Union (FSU) countries, this appendix applies the methodology developed in Section IV.1 to several additional low-income food-deficit Asian and FSU countries that imported substantial amounts of cereals but for which food imports were a small proportion of total imports (less than 20 percent) in 1993. The following six countries together accounted for more than one half the total value of commercial cereals purchases by low-income food-deficit countries, according to the FAO: Afghanistan, Bangladesh, China, Indonesia, Pakistan, and the Philippines. 1/ While food imports constituted a small proportion of total merchandise imports for the East Asian countries in this group during 1993 (China, 3 percent; Indonesia, 5 percent; and the Philippines, 5 percent), this proportion was higher (albeit less than 20 percent) for the other three Asian countries (Afghanistan, 14 percent; Bangladesh, 15 percent; and Pakistan, 13 percent). Among the FSU countries, Uzbekistan also makes particularly large commercial imports of cereals. 2/

Results are shown in Tables 12 and 13 for Scenarios I and II, respectively. It is apparent that estimated changes in net import costs for the four food product groups considered stem primarily from changes in the price of wheat. In Scenario II, which assumes the larger increase in wheat prices due to the Round, increases in the cost of wheat imports exceeded US$10 million in 2000 for six of the seven countries, the exception being Afghanistan. The increase for China was the largest, amounting to nearly US$70 million; however, this was partly offset by increased sugar prices (China is a net exporter of sugar). Although net import costs for the four selected commodities increased by US$50 million (nearly 20 percent), this increase amounted to less than 1 percent of China's total food imports.

Absolute increases in net import costs for the selected commodities were also substantial for Bangladesh (US$15 million), Indonesia (US$36 million), Pakistan (US$38 million), the Philippines (US$21 million), and Uzbekistan (US$40 million); these increases were primarily due to higher world wheat prices. For Pakistan, the increase in net import costs also accounted for a substantial proportion of net imports of the four selected commodities (11 percent). For Bangladesh, Indonesia, the Philippines, and Uzbekistan, however, these changes were small (less than 5 percent) in relation to net imports of the selected commodities. For Afghanistan, both absolute and percent changes were small.

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1/ FAO (July 1995), page 48.
2/ FAO data on food imports (excluding fish) were unavailable for Uzbekistan. However, Fund staff estimates indicate that food stuffs imports accounted for 19 percent of total merchandise imports in 1993.

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports (in millions of dollars) | Relative Change 1/ (sum/net imports) (percent) | Uruguay Round Scenario food imports 2/ (in millions of dollars) | Relative Change 3/ (sum/food (imports) (percent) |
| | Coarse Grains | Wheat | Rice | Sugar | Sum | | | | |
|---|---|---|---|---|---|---|---|---|---|
| fghanistan | -- | 0.72 | -0.69 | -0.33 | -0.30 | 119.90 | -0.25 | 198.91 | -0.15 |
| angladesh | -- | 3.89 | -0.18 | -1.89 | 1.82 | 454.60 | 0.40 | 1061.19 | 0.17 |
| hina | -0.14 | 21.90 | 5.46 | 10.24 | 37.46 | 262.36 | 14.28 | 8749.60 | 0.43 |
| ndonesia | 0.13 | 10.05 | 1.21 | -1.05 | 10.34 | 853.15 | 1.21 | 2377.69 | 0.43 |
| akistan | -- | 10.61 | 8.00 | -0.51 | 18.10 | 348.04 | 5.20 | 2287.69 | 0.79 |
| hilippines | -- | 6.79 | -1.21 | -0.13 | 5.45 | 574.65 | 0.95 | 1731.99 | 0.31 |
| zbekistan | -- | 13.19 | -0.48 | -- | 12.71 | 979.81 | 1.30 | ... | ... |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| ghanistan | -- | 2.20 | -0.41 | 0.58 | 2.37 | 119.90 | 1.98 | 198.91 | 1.19 |
| ngladesh | -- | 11.99 | -0.11 | 3.29 | 15.18 | 454.60 | 3.34 | 1061.19 | 1.43 |
| ina | -3.04 | 67.48 | 3.26 | -17.83 | 49.87 | 262.36 | 19.01 | 8749.60 | 0.57 |
| donesia | 2.79 | 30.97 | 0.72 | 1.82 | 36.31 | 853.15 | 4.26 | 2377.69 | 1.53 |
| kistan | 0.03 | 32.69 | 4.79 | 0.89 | 38.40 | 348.04 | 11.03 | 2287.69 | 1.68 |
| ilippines | 0.09 | 20.92 | -0.73 | 0.23 | 20.51 | 574.65 | 3.57 | 1731.99 | 1.18 |
| bekistan | -- | 40.65 | -0.29 | -- | 40.36 | 979.81 | 4.12 | ... | ... |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

Table 14. Growth of Production of Selected Agricultural
Commodities, Past and Projected

(percent per annum)

| Commodity | World | | Developing Countries | |
|---|---|---|---|---|
| | 1988-2000 base | 1988-2000 U.R. | 1988-2000 base | 1988-2000 U.R. |
| All commodities | 1.6 | 1.6 | 3.1 | 3.1 |
| Foodstuffs | 1.6 | 1.6 | 3.2 | 3.2 |
| Wheat | 1.7 | 1.6 | 2.7 | 2.9 |
| Rice | 1.8 | 1.8 | 1.9 | 1.9 |
| Total coarse grains | 1.6 | 1.7 | 2.9 | 2.9 |
| Sugar | 1.8 | 1.8 | 2.3 | 2.4 |
| Pig meat | 2.2 | 2.0 | 4.4 | 4.3 |

Source: FAO (1995), Table 1a, page 4.
Base: Projections without Uruguay Round effects.
U.R.: Projections with Uruguay Round effects.

Table 15. Growth of Imports of Selected Agricultural
Commodities, Past and Projected

(percent per annum)

| Commodity | World | | Developing Countries | |
|---|---|---|---|---|
| | 1988-2000 base | 1988-2000 U.R. | 1988-2000 base | 1988-2000 U.R |
| All commodities | 1.4 | 1.6 | 3.1 | 3.1 |
| Foodstuffs | 1.5 | 1.7 | 3.5 | 3.5 |
| Wheat | 0.2 | -- | 1.9 | 1.3 |
| Rice | 3.2 | 3.8 | 3.5 | 3.7 |
| Total coarse grains | 0.8 | 1.0 | 4.1 | 4.2 |
| Sugar | 1.0 | 1.1 | 1.4 | 1.5 |
| Pig meat | 0.9 | 0.8 | 3.8 | 3.7 |

Source: FAO (1995), Table 1c, page 6.
Base: Projections without Uruguay Round effects.
U.R.: Projections with Uruguay Round effects.

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 0.44 | 14.80 | -0.47 | -0.60 | 14.16 | 1520.10 | 0.93 | 3656.53 | 0.39 |
| Angola | 0.02 | 0.44 | -0.91 | -0.66 | -1.11 | 162.21 | -0.68 | 465.35 | -0.24 |
| Benin | 0.01 | 0.25 | -0.64 | -0.28 | -0.66 | 85.83 | -0.77 | 180.70 | -0.37 |
| Botswana | 0.03 | 0.26 | -0.37 | -0.01 | -0.09 | 67.94 | -0.13 | 398.17 | -0.02 |
| Burkina Faso | -- | 0.11 | -0.98 | -0.05 | -0.91 | 70.17 | -1.30 | 139.68 | -0.65 |
| Burundi | -- | 0.12 | -0.02 | -0.02 | 0.07 | 11.13 | 0.67 | 36.60 | 0.20 |
| Cameroon | -- | 0.65 | -0.31 | -0.09 | 0.25 | 76.55 | 0.33 | 240.63 | 0.10 |
| Cape Verde | 0.01 | 0.04 | -0.16 | -0.15 | -0.26 | 29.71 | -0.89 | 70.19 | -0.38 |
| Central African Republic | -- | 0.13 | -0.01 | -0.03 | 0.09 | 12.77 | 0.70 | 48.09 | 0.19 |
| Chad | -- | 0.17 | -0.14 | -0.06 | -0.03 | 26.53 | -0.11 | 33.06 | -0.09 |
| Comoros | -- | 0.02 | -0.31 | -0.06 | -0.34 | 24.62 | -1.39 | 40.49 | -0.85 |
| Congo | -- | 0.55 | -0.33 | -0.10 | 0.12 | 67.08 | 0.18 | 228.43 | 0.05 |
| Côte d'Ivoire | -- | 0.71 | -3.50 | -0.35 | -3.13 | 286.54 | -1.09 | 624.66 | -0.50 |
| Djibouti | -- | 0.08 | -0.16 | -0.09 | -0.17 | 24.46 | -0.70 | 63.63 | -0.20 |
| Egypt | 0.48 | 14.39 | 1.00 | -1.43 | 14.44 | 1514.28 | 0.95 | 3139.55 | 0.46 |
| Equatorial Guinea | -- | 0.02 | -0.05 | -- | -0.03 | 4.93 | -0.69 | 18.92 | -0.18 |
| Ethiopia 4/ | 0.03 | 3.87 | -0.14 | -0.04 | 3.72 | 315.77 | 1.18 | 461.82 | 0.80 |
| Gabon | -- | 0.23 | -0.44 | -- | -0.21 | 42.85 | -0.48 | 221.01 | -0.09 |
| Gambia, The | -- | 0.17 | -0.49 | -0.57 | -0.89 | 89.47 | -0.99 | 136.14 | -0.65 |
| Ghana | 0.01 | 0.92 | -1.14 | -1.04 | -1.26 | 226.98 | -0.55 | 380.13 | -0.33 |
| Guinea | -- | 0.38 | -1.36 | -0.48 | -1.46 | 147.57 | -0.99 | 242.93 | -0.60 |
| Guinea-Bissau | -- | 0.01 | -0.56 | -0.01 | -0.56 | 34.66 | -1.62 | 44.91 | -1.25 |
| Kenya | 0.04 | 1.43 | -0.46 | -- | 1.02 | 166.49 | 0.61 | 368.99 | 0.28 |
| Lesotho | 0.02 | 0.20 | -0.04 | -0.22 | -0.04 | 50.45 | -0.08 | 206.16 | -0.02 |
| Liberia | -- | 0.04 | -1.40 | -0.05 | -1.42 | 88.18 | -1.61 | 137.38 | -1.03 |
| Madagascar | -- | 0.27 | -0.14 | -- | 0.14 | 29.50 | 0.47 | 82.04 | 0.17 |
| Malawi | 0.20 | 0.11 | -0.03 | 0.07 | 0.35 | 177.82 | 0.20 | 225.96 | 0.15 |
| Mali | -- | 0.17 | -0.34 | -0.40 | -0.57 | 65.31 | -0.87 | 136.32 | -0.42 |
| Mauritania | 0.01 | 0.69 | -0.56 | -0.48 | -0.34 | 128.79 | -0.26 | 205.80 | -0.17 |
| Mauritius | 0.01 | 0.35 | -0.60 | -- | -0.24 | 69.98 | -0.34 | 326.56 | 0.07 |
| Morocco | 0.22 | 7.93 | -0.02 | -- | 8.14 | 762.66 | 1.07 | 1536.98 | 0.53 |
| Mozambique | 0.08 | 0.50 | -0.72 | -0.45 | -0.59 | 185.55 | -0.32 | 292.26 | -0.20 |
| Namibia | 0.03 | 0.05 | -- | -0.63 | -0.55 | 82.35 | -0.67 | 192.01 | -0.29 |
| Niger | -- | 0.29 | -0.59 | -0.27 | -0.57 | 80.64 | -0.70 | 143.92 | -0.39 |
| Nigeria | -- | 4.49 | -2.97 | -3.95 | -2.42 | 838.74 | -0.29 | 1517.53 | -0.16 |
| Rwanda | 0.03 | 0.08 | -0.04 | -0.08 | -0.01 | 39.99 | -0.02 | 115.45 | -0.01 |

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | Uruguay Round Scenario net imports (in millions of dollars) | Relative Change 1/ (sum/net imports) (percent) | Uruguay Round Scenario food imports 2/ (in millions of dollars) | Relative Change 3/ (sum/food (imports) (percent) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | | | | |
| São Tomé & Príncipe | -- | 0.02 | -0.04 | -0.01 | -0.03 | 5.19 | -0.54 | 9.55 | -0.29 |
| Senegal | 0.01 | 0.81 | -2.73 | -0.22 | -2.14 | 243.58 | -0.88 | 579.75 | -0.37 |
| Seychelles | -- | 0.03 | -0.08 | -0.05 | -0.09 | 11.22 | -0.84 | 48.93 | -0.19 |
| Sierra Leone | -- | 0.10 | -1.01 | -0.13 | -1.03 | 76.89 | -1.34 | 150.11 | -0.69 |
| Somalia | 0.01 | 0.47 | -0.77 | -0.18 | -0.46 | 105.73 | -0.44 | 136.67 | -0.34 |
| South Africa | -0.22 | 2.51 | -4.06 | 0.13 | -1.64 | 220.27 | -0.75 | 1679.66 | -0.10 |
| Sudan | -0.08 | 0.97 | -1.47 | 0.58 | -0.01 | 33.58 | -0.03 | 334.34 | -- |
| Swaziland | 0.01 | 0.06 | -0.15 | 0.13 | 0.05 | 8.60 | 0.60 | 134.73 | 0.04 |
| Tanzania | 0.01 | 0.31 | -0.89 | -0.05 | -0.62 | 88.92 | -0.70 | 178.04 | -0.35 |
| Togo | -- | 0.12 | -0.09 | -0.08 | -0.04 | 20.60 | -0.22 | 58.52 | -0.08 |
| Uganda | -0.02 | 0.11 | -0.01 | -0.06 | 0.02 | -0.75 | -2.41 | 74.44 | 0.02 |
| Zaïre | 0.01 | 0.73 | -0.65 | -0.08 | -- | 108.22 | -- | 296.50 | -- |
| Zambia | 0.09 | 0.19 | -0.03 | 0.18 | 0.43 | 72.76 | 0.58 | 123.41 | 0.34 |
| Zimbabwe | 0.15 | 0.11 | -0.11 | -- | 0.15 | 144.45 | 0.11 | 316.66 | 0.05 |
| Haiti | -- | 1.05 | -1.47 | -0.32 | -0.74 | 190.35 | -0.39 | 337.35 | -0.22 |
| Jamaica | 0.05 | 0.69 | -0.66 | -0.39 | -0.32 | 160.62 | -0.20 | 410.90 | -0.08 |
| Mexico | 0.96 | 5.36 | -2.35 | -0.22 | 3.75 | 1359.93 | 0.28 | 7959.28 | 0.05 |
| Peru | 0.18 | 3.58 | -3.03 | -1.88 | -1.15 | 750.98 | -0.15 | 1257.98 | -0.09 |
| Yemen | 0.03 | 5.21 | -1.31 | -3.05 | 0.89 | 743.23 | 0.12 | 1170.46 | 0.08 |
| Albania | -- | 2.94 | -0.41 | -0.76 | 1.78 | 300.78 | 0.59 | 487.63 | 0.36 |
| Kiribati | -- | 0.02 | -0.06 | -- | -0.04 | 4.87 | -0.80 | 12.73 | -0.31 |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
4/ 1992 data.

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports (in millions of dollars) | Relative Change 1/ (sum/net imports) (percent) | Uruguay Round Scenario food imports 2/ (in millions of dollars) | Relative Change 3/ (sum/food (imports) (percent) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | | | | |
| Algeria | 9.70 | 45.58 | -0.28 | 1.05 | 56.05 | 1520.10 | 3.69 | 3656.53 | 1.53 |
| Angola | 0.52 | 1.36 | -0.55 | 1.15 | 2.49 | 162.21 | 1.54 | 465.35 | 0.54 |
| Benin | 0.15 | 0.79 | -0.38 | 0.49 | 1.05 | 85.83 | 1.22 | 180.70 | 0.58 |
| Botswana | 0.70 | 0.81 | -0.22 | 0.01 | 1.29 | 67.94 | 1.90 | 398.17 | 0.32 |
| Burkina Faso | 0.03 | 0.35 | -0.59 | 0.08 | -0.12 | 70.17 | -0.18 | 139.68 | -0.09 |
| Burundi | -- | 0.35 | -0.01 | 0.03 | 0.37 | 11.13 | 3.31 | 36.60 | 1.01 |
| Cameroon | 0.08 | 2.02 | -0.19 | 0.16 | 2.07 | 76.55 | 2.71 | 240.63 | 0.86 |
| Cape Verde | 0.12 | 0.12 | -0.09 | 0.27 | 0.41 | 29.71 | 1.39 | 70.19 | 0.59 |
| Central African Republic | -- | 0.41 | -0.01 | 0.05 | 0.45 | 12.77 | 3.50 | 48.09 | 0.93 |
| Chad | 0.03 | 0.52 | -0.08 | 0.10 | 0.57 | 26.53 | 2.14 | 33.06 | 1.71 |
| Comoros | -- | 0.08 | -0.19 | 0.10 | -0.01 | 24.62 | -0.05 | 40.49 | -0.03 |
| Congo | -- | 1.69 | -0.20 | 0.17 | 1.67 | 67.08 | 2.49 | 228.43 | 0.73 |
| Côte d'Ivoire | 0.06 | 2.20 | -2.09 | 0.62 | 0.78 | 286.54 | 0.27 | 624.66 | 0.13 |
| Djibouti | 0.02 | 0.26 | -0.10 | 0.16 | 0.35 | 24.46 | 1.41 | 83.63 | 0.41 |
| Egypt | 10.65 | 44.34 | 0.60 | 2.49 | 58.08 | 1514.28 | 3.84 | 3139.55 | 1.85 |
| Equatorial Guinea | -- | 0.07 | -0.03 | 0.01 | 0.04 | 4.93 | 0.87 | 18.92 | 0.23 |
| Ethiopia 4/ | 0.65 | 11.92 | -0.08 | 0.08 | 12.56 | 315.77 | 3.98 | 461.82 | 2.72 |
| Gabon | 0.01 | 0.72 | -0.26 | -- | 0.47 | 42.85 | 1.10 | 221.01 | 0.21 |
| Gambia, The | -- | 0.52 | -0.29 | 0.99 | 1.21 | 89.47 | 1.35 | 136.14 | 0.89 |
| Ghana | 0.12 | 2.83 | -0.68 | 1.81 | 4.08 | 226.98 | 1.80 | 380.13 | 1.07 |
| Guinea | -- | 1.18 | -0.81 | 0.83 | 1.20 | 147.57 | 0.81 | 242.93 | 0.49 |
| Guinea-Bissau | -- | 0.04 | -0.34 | 0.02 | -0.27 | 34.66 | -0.78 | 44.91 | -0.60 |
| Kenya | 0.95 | 4.42 | -0.27 | -- | 5.10 | 166.49 | 3.06 | 368.99 | 1.38 |
| Lesotho | 0.40 | 0.61 | -0.02 | 0.37 | 1.36 | 50.45 | 2.69 | 206.16 | 0.66 |
| Liberia | -- | 0.11 | -0.84 | 0.09 | -0.64 | 88.18 | -0.73 | 137.38 | -0.47 |
| Madagascar | 0.05 | 0.84 | -0.08 | -- | 0.81 | 29.50 | 2.74 | 82.04 | 0.98 |
| Malawi | 4.53 | 0.32 | -0.02 | -0.11 | 4.72 | 177.82 | 2.66 | 225.96 | 2.09 |
| Mali | -0.04 | 0.53 | -0.20 | 0.70 | 0.99 | 65.31 | 1.51 | 136.32 | 0.72 |
| Mauritania | 0.12 | 2.14 | -0.33 | 0.84 | 2.77 | 128.79 | 2.15 | 205.80 | 1.35 |
| Mauritius | 0.25 | 1.08 | -0.36 | -- | 0.98 | 69.98 | 1.40 | 326.56 | 0.30 |
| Morocco | 4.92 | 24.44 | -0.01 | -- | 29.35 | 762.66 | 3.85 | 1536.98 | 1.91 |
| Mozambique | 1.80 | 1.54 | -0.43 | 0.78 | 3.69 | 185.55 | 1.99 | 292.26 | 1.26 |
| Namibia | 0.64 | 0.14 | -- | 1.09 | 1.88 | 82.35 | 2.28 | 192.01 | 0.98 |
| Niger | 0.08 | 0.88 | -0.35 | 0.47 | 1.07 | 80.64 | 1.33 | 143.92 | 0.74 |
| Nigeria | 0.04 | 13.85 | -1.78 | 6.87 | 18.98 | 838.74 | 2.26 | 1517.53 | 1.25 |
| Rwanda | 0.67 | 0.24 | -0.02 | 0.14 | 1.02 | 39.99 | 2.54 | 115.45 | 0.88 |

Table 17 (concluded).  Impact of the Uruguay Round Agreement on Net Imports of 57 Countries,
in the Year 2000, Assuming Price Changes as in Scenario II

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| São Tomé & Príncipe | -- | 0.08 | -0.02 | 0.02 | 0.08 | 5.19 | 1.45 | 9.55 | 0.79 |
| Senegal | 0.21 | 2.49 | -1.63 | 0.39 | 1.46 | 243.58 | 0.60 | 579.75 | 0.25 |
| Seychelles | 0.01 | 0.10 | -0.05 | 0.08 | 0.14 | 11.22 | 1.25 | 48.98 | 0.29 |
| Sierra Leone | -- | 0.32 | -0.61 | 0.22 | -0.07 | 76.89 | -0.09 | 150.11 | -0.04 |
| Somalia | 0.32 | 1.45 | -0.46 | 0.31 | 1.61 | 105.73 | 1.52 | 136.67 | 1.18 |
| South Africa | -4.79 | 7.72 | -2.43 | -0.22 | 0.28 | 220.27 | 0.13 | 1679.66 | 0.02 |
| Sudan | -1.85 | 2.98 | -0.88 | -1.00 | -0.76 | 33.58 | -2.26 | 334.34 | -0.23 |
| Swaziland | 0.17 | 0.20 | -0.09 | -0.23 | 0.05 | 8.60 | 0.59 | 134.73 | 0.04 |
| Tanzania | 0.29 | 0.94 | -0.53 | 0.08 | 0.78 | 88.92 | 0.88 | 178.04 | 0.44 |
| Togo | -- | 0.37 | -0.05 | 0.13 | 0.45 | 20.60 | 2.21 | 58.52 | 0.78 |
| Uganda | -0.36 | 0.32 | -0.01 | 0.10 | 0.05 | -0.75 | -6.58 | 74.44 | 0.07 |
| Zaïre | 0.28 | 2.24 | -0.39 | 0.14 | 2.27 | 108.22 | 2.10 | 296.50 | 0.77 |
| Zambia | 1.90 | 0.58 | -0.02 | -0.31 | 2.15 | 72.76 | 2.96 | 123.41 | 1.74 |
| Zimbabwe | 3.39 | 0.33 | -0.06 | -- | 3.66 | 144.45 | 2.53 | 316.66 | 1.15 |
| Haiti | 0.06 | 3.22 | -0.88 | 0.56 | 2.96 | 190.35 | 1.55 | 337.35 | 0.88 |
| Jamaica | 1.02 | 2.12 | -0.39 | 0.68 | 3.42 | 160.62 | 2.13 | 410.90 | 0.83 |
| Mexico | 21.25 | 16.53 | -1.41 | 0.38 | 36.75 | 1359.93 | 2.70 | 7959.28 | 0.46 |
| Peru | 4.03 | 11.02 | -1.81 | 3.28 | 16.51 | 750.98 | 2.20 | 1257.98 | 1.31 |
| Yemen | 0.73 | 16.05 | -0.78 | 5.31 | 21.31 | 743.23 | 2.87 | 1170.46 | 1.82 |
| Albania | -- | 9.05 | -0.24 | 1.32 | 10.13 | 300.78 | 3.37 | 487.63 | 2.08 |
| Kiribati | -- | 0.06 | -0.04 | -- | 0.03 | 4.87 | 0.56 | 12.73 | 0.21 |

1/  Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/  Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/  Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
4/  1992 data.

Table 3.   Change in International Food Prices
between 1987-89 and 2000

(percent)

|  | Base Line | Effect of the Uruguay Round | Total Change 1/ |
|---|---|---|---|
| Wheat | -3 | 7 | 4 |
| Rice | 7 | 7 | 15 |
| Maize | 3 | 4 | 7 |
| Millet/sorghum | 6 | 4 | 10 |
| Other grains | -3 | 7 | 5 |
| Fats and oils | -4 | 4 | -- |
| Oilmeal proteins | 3 | -- | 3 |
| Bovine meat | 6 | 8 | 14 |
| Pig meat | 3 | 10 | 13 |
| Sheep meat | 13 | 10 | 24 |
| Poultry | 5 | 8 | 14 |
| Milk | 32 | 7 | 41 |

Source:   FAO (1995), Table 2, page 11.

1/   Total does not necessarily equal the sum of the two effects.

Their first simulation assumes as a baseline that the level of protection until the year 2002 would be the same as the average level during the period 1982-93.   During the eighties there was a strong trend of increasing protection in agriculture in the developed countries, while in the second half of the decade many developing countries, especially in Latin America, made some efforts to liberalize their agricultural sectors.   The use of a long-run average as a base line serves to smooth these fluctuations.   They construct a scenario in which they assume that only the liberalization measures concerning border protection are implemented, while input subsidies remain unchanged (Scenario I).

Whereas Goldin and van der Mensbrugghe explicitly refer only to tariff reductions, the way border protection is modeled in the RUNS model implicitly covers the reductions of export subsidies as well.   To measure border protection, the RUNS model uses "price wedges," defined as the domestic price divided by the world price; this is influenced not only by tariffs but also by export subsidies.

Table 4.  Decomposition of Price Wedge Effects

| Price ratio | Net Importer | Net Exporter |
|-------------|--------------|--------------|
| pp/pw < 1 | Import Subsidies | Export Taxes |
| pp/pw > 1 | Import Tariffs | Export Subsidies |

Source:  Goldin and van der Mensbrugghe (1995) Table 1.4, page 43.

pp: domestic price; pw: world price.


Scenario II includes the same liberalization as Scenario I but compares this to a baseline in which the level of protection stays constant at the average level of 1991-93.

Scenario III is similar to Scenario II but includes reductions in input subsidies in the bundle of liberalization measures.  Unlike reductions in tariffs and in export subsidies, Goldin and van der Mensbrugghe do not use countries' actual offers but assume that the OECD countries reduce all input subsidies by 36 percent and non-OECD countries reduce all import subsidies by 24 percent, as specified in the agreement.

Scenario IV, in contrast, assumes that liberalization takes place as specified in the proposals of the Draft Final Act instead of referring to the Final Act and actual offers.  This allows a comparison with their earlier study (Goldin, Knudsen, and van der Mensbrugghe (1993), and sheds some light on the differences in the projected impacts obtained in earlier studies based upon the Draft Final Act and more recent ones based upon the Final Act.  Finally, Scenario V attempts to allow for the possibility that unemployment might have a strong influence on the outcomes.

As expected, the resulting changes in world prices and welfare differ substantially under the five scenarios.  However, the assumptions of Scenarios III-V appear unrealistic for several reasons.  Scenario III takes reductions of input subsidies into account, in addition to the tariff reductions assumed in Scenario II.  It therefore yields larger changes in prices and welfare levels.  Despite the fact that reductions of input subsidies are part of the Agreement on Agriculture, for reasons given above it is very unlikely that they will result in such high, if any, effective changes in input subsidies.

Scenario IV is mainly of historical value and was only calculated to show the difference between this and the earlier study, and Scenario V is subject to many caveats.  Therefore, the remainder of this paper will focus entirely on the first two scenarios, using Scenario I as a lower limit and Scenario II as an upper limit on the effects of the Uruguay Round.

Table 5.   Main Assumptions of Scenarios I to V

| Assumptions: | Scenario I | Scenario II | Scenario III | Scenario IV | Scenario V |
|---|---|---|---|---|---|
| Reference period | 1982-93 | 1991-93 | 1991-93 | 1991-93 | 1991-93 |
| Tariffication | Y | Y | Y | Y | Y |
| Tariff reductions | Y | Y | Y | Y | Y |
| Reductions of input subsidies | | | Y | Y | Y |
| Draft Final Act | | | | Y | |
| Unemployment | | | | | Y |

While the assumed post-Uruguay Round tariff levels are exactly the same in *Scenarios I and II*, *price changes and welfare effects are much higher in* Scenario II because tariff reductions 1/ are much larger in comparison to the baseline tariff level under this scenario.

Price changes under Scenario I are no greater than 1.7 percent for any of the commodity groups, and are often negative. Viewed in the context of the instability and secular movement in world commodity prices they are barely significant. Indeed, as Table 6 shows, prices of most of the commodities tend to decline in Scenario I. According to Goldin and van der Mensbrugghe (1995), these small negative price changes can be attributed to increased production of crops that remain relatively more protected than other crops, occupying land previously devoted to now less protected crops. Their estimated effects reveal that China and India, as large exporters, might suffer from lower rice prices while Mexico and sub-Saharan Africa, as net food importers, may have to face slightly higher net import costs due to higher cereals prices.

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1/   The terms "tariff reductions" or "tariff levels" are for the remainder of this section meant to include implicitly export subsidies as well.

Table 6.  Changes in World Agricultural Prices

(percentage deviations from benchmark levels in 2000)

|                      | Scenario I | Scenario II |
|----------------------|------------|-------------|
| Wheat                | 1.2        | 3.8         |
| Rice                 | -1.5       | -0.9        |
| Coarse grains        | 0.1        | 2.3         |
| Sugar                | -1.0       | 1.8         |
| Beef, veal, & sheep  | 0.2        | 0.6         |
| Other meats          | -0.9       | -0.6        |
| Coffee               | -1.7       | -1.5        |
| Cocoa                | -1.3       | -0.7        |
| Tea                  | -1.6       | -1.4        |
| Oils                 | -0.6       | -0.3        |
| Dairy                | -1.3       | 1.2         |
| Other food products  | -1.3       | -1.4        |

Source:  Goldin and van der Mensbrugghe (1995), Table 3, page 28.

The relatively stronger liberalization effects in Scenario II result in a larger drop in the supply of temperate foodstuffs, particularly of cereals, in the industrial countries.  But even in this scenario price changes stay in a quite narrow range of -1.5 percent to +3.8 percent. Global welfare rises because higher welfare levels in other developing countries and OECD countries more than offset modest losses in some African, Latin American, and low-income developing countries.

4.  Comparison of studies

Comparing the three surveyed studies reveals that projected changes in food prices are largest in the FAO (1995) study, and lowest in Scenario I of Goldin and van der Mensbrugghe (1995); these studies are summarized in Table 7.  The main reason for the stronger effects obtained in FAO (1995) is that it uses for its calculations the very high tariff levels in 1986-88 as a base from which tariff reductions are computed, rather than the applied rates in effect prior to the start of the Uruguay Round Agreement on Agriculture implementation period (January 1, 1995).  Therefore, the FAO (1995) study severely overstates the degree of liberalization, and in turn overstates the resulting price changes. 1/

1/  As has been shown in Table 1, effective changes in tariffs and, consequently, in prices are rare.

Table 7.  Summary of the Studies

| Study | Model | Assumptions | Results |
|---|---|---|---|
| Page and Davenport | RUNS Model | Reduction in tariffs and subsidies as given in the agreement applies to all commodities. | Unweighted average price increase:  2.3 percent, largest effects on dairy products (6.2 percent) and sugar (5.2 percent). |
| FAO | World Food Model | Average reduction in tariffs and export subsidies as given in the countries' schedules; new tariff levels correspond to tariff ceilings, despite actual tariff levels. | Negligible effects on world food production, zero or positive price changes, largest effect on pig meat and sheep meat (10 percent), effects on net food import bills on average positive, modest losses for the regions Africa and Near East. |
| Goldin and van der Mensbrugghe | RUNS Model | See Table 5. | Scenario I: Very modest price declines for most of goods, largest increase in wheat prices (1.2 percent), welfare changes less than 1 percent.<br><br>Scenario II: Slightly higher price changes, largest increase in wheat prices (3.8 percent), welfare changes are less than 1 percent for all regions except Upper Income Asia (1.3 percent). |

The most important difference between the studies by Goldin and van der Mensbrugghe (1995) and Page and Davenport (1994), with respect to changes in world food prices, is that the latter study utilizes changes in protection agreed in principle in the Uruguay Round Agreement on Agriculture but did not base such changes on countries' actual schedules of commitments and applied protection levels. The Goldin and van der Mensbrugghe (1995) study avoids the shortcomings of the other two studies in using the actual schedules of commitments while taking into consideration that reductions of high tariff bindings may not result in actual liberalization if the new bound tariff ceilings are higher than currently applied tariff rates.

## IV. Empirical Analysis of the Impact of Price Changes

Liberalization of agriculture as a result of commitments made in the Uruguay Round will lead to changes in world food prices as trade barriers and subsidies are gradually reduced over the six-year implementation period. Previous studies, discussed in Section III above, provide estimates of the long-run effects of the Round on world food prices, once the Agreement on Agriculture is fully implemented. Information on the balance of payments implications of these expected changes in world food prices for individual net food-importing developing countries is limited, however. To fill this gap, this section will use estimated price changes from Goldin and van der Mensbrugghe (1995), since this study employs more realistic estimates of the liberalization of agricultural trade barriers than other studies, 1/ to assess the implications of the Round empirically for a sample of 57 developing countries. The analysis provides projections for net food imports of four commodities (coarse grains, wheat, rice, and sugar) through the end of the six-year implementation period, focusing on the incremental effect of the Uruguay Round Agreement on Agriculture on the food import bills of the countries analyzed at the end of this period, in the year 2000. It should be stressed that the analysis does not attempt to assess the implications of the recent food price spike for balance of payments need for these countries, since this is unrelated to the Round.

This section first presents the methodology for projecting changes in net food imports in 2000 due to the Round, including the selection of countries and commodities for analysis, m n assumptions underlying the baseline projections for net imports over the medium term, and the

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1/ Goldin and van der Mensbrugghe compare Ingco's (1995) estimates of the ad valorem equivalents of agricultural tariff bindings specified by countries in their Uruguay Round commitment schedules, with rates of protection actually in effect prior to the start of the implementation period of the Agreement on Agriculture. This provides a more accurate picture of the true extent of liberalization than simply applying percentage reductions to the often very high bound rates specified in countries' commitment schedules, as was done for instance in the FAO (1995) study.

sensitivity of findings to changes in these assumptions. Following this, the empirical results will be presented, along with an analysis of how the outcome for a particular country depends upon the commodity composition of its food trade, and whether the country is a net exporter or a net importer of each commodity.

1.   Methodology

Estimates of the impact of changes in world food prices due to the Round on net food imports for individual developing countries will be obtained by preparing a baseline projection for net food imports during 1994-2000, which incorporates the effects of agricultural trade liberalization agreed in the Round.  Then, two alternative projections will be prepared based on the counterfactual assumption that agricultural trade liberalization due to the Round is absent.  These two alternative projections differ in their specification of how much world food prices are expected to change as a result of the Round, and correspond to Scenarios I and II from the Goldin and van der Mensbrugghe (1995) study. 1/ Import and export volumes will be assumed unchanged as a result of trade liberalization under the Uruguay Round Agreement on Agriculture; as discussed below, this simplifies the analysis considerably but may impart an upward bias to the estimated changes in net food imports.  Comparison of the baseline with each of the two alternative scenarios will provide a low and high estimate of the incremental effect of the Uruguay Round Agreement on Agriculture on net food imports for each developing country in the sample.

a.   Country/commodity sample

To make the analysis manageable, it will be necessary to limit the number of countries included for analysis, as well as to focus on certain commodity groups.  This paper includes projections for 57 net food importing and other developing countries for each of four commodity groups:  coarse grains, wheat, rice, and sugar.  While it would be possible to include additional countries and commodities in the sample, this would not appreciably alter the qualitative conclusions that would be derived from the analysis presented below.

Regarding the selection of countries, this was specified by starting with the Group of Net Food Importers described above, adding all countries

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1/ The low and high estimates of the price effects of the Uruguay Round Agreement on Agriculture differ in their specification of the height of trade barriers that are expected to prevail in the 1994-2002 period in the absence of the liberalization that is being undertaken as a result of the Round.  Scenario I assumes that liberalization would remain at average levels during 1982-93, whereas Scenario II assumes liberalization would remain at the higher levels prevailing during 1990-93.  Starting from a higher base, Scenario II features larger cuts in trade barriers and hence finds larger changes in world food prices as a result of the Round.

in sub-Saharan Africa, and supplementing this list by an additional five countries. The additional countries were selected according to the following criteria: (1) food imports were at least twice as large as food exports during 1993; (2) food imports accounted for at least 20 percent of merchandise imports during 1993; and (3) the country is an IMF member. 1/ While the country sample analyzed in the main body of the paper does not include any Asian or former Soviet Union (FSU) countries since food accounted for only a small proportion of total imports for these countries during 1993 (less than 20 percent), many of these countries import substantial amounts of food. Therefore, projections for seven additional Asian and FSU countries are included in Appendix II.

The commodities selected for analysis were chosen to reflect the composition of food imports by most net food-importing developing countries. 2/ Several other agricultural commodities, such as coffee, tea, and meat, were excluded. These other commodities represent important sources of foreign exchange earnings for many developing countries rather than imports for basic food requirements; inclusion of these commodities would therefore distort the analysis. The exact composition of the four food commodity groups was dictated by use of the FAO Trade Yearbook as the basic data source. 3/

b.   Projected effects of the Uruguay Round

A baseline projection for net food imports for each country during 1994-2000 will be constructed below for each of the four food commodities analyzed; this baseline incorporates the effects of the Uruguay Round Agreement on Agriculture. The baseline projection is only important for setting the levels of net food imports in the year 2000 for each country and commodity, which are then simply reduced by the percentage increases in world food prices due to the Uruguay Round Agreement on Agriculture obtained by Goldin and van der Mensbrugghe in Scenarios I and II. While the U.S. dollar changes in net food imports will be influenced to some extent by the specification of the baseline projections, percent changes in net import values due to the Round will not; percent changes in net food imports will

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1/ Out of the Group of Net Food Importers only Egypt would be included in the sample defined by these criteria; out of the group of sub-Saharan African countries, only 12 would meet these criteria.

2/ The four products accounted for 15 to 84 percent of total food imports in 1993 for the 57 countries in the sample, or 47 percent on average.

3/ The main alternative source of food export and import data is the United Nations commodity trade statistics. These only take into account the amounts reported to the customs authorities, which may result in under-recording of food aid, and do not provide recent data for many developing countries.

be equal to the percent changes in world food prices, under the assumption that trade volumes would be unaffected by the Round. 1/

Separate projections for 1994-2000 will be made for exports and imports of each commodity group for each country. These will be based on data on export and import values and volumes by commodity and country for 1993 (the latest year for which data are available) from FAO (1994). 2/ Unit values will be computed by taking the ratio of value and volume.

Starting from 1993 unit values, import and export prices will be projected based on commodity price projections prepared jointly by the Research Departments of the Fund and the World Bank in connection with the World Economic Outlook exercise; these latter commodity price projections, as well as projections of economic growth used below, will be referred to as the "WEO projections." 3/

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1/ The assumption that trade volumes are unaffected by trade liberalization due to the Uruguay Round Agreement on Agriculture may impart an upward bias to estimated changes in net food imports. An increase in world cereals prices, for instance, will tend to reduce demand for imports and increase export supply.

2/ Wheat comprises wheat and wheat flour in wheat equivalent (SITC 041/046). Coarse grains (SITC 043, 044, 045.1, 045.2, 045.9, 048.2) are calculated as cereals minus wheat and wheat flour and rice (SITC 042) and sugar is defined as refined sugar (SITC 061.2).

3/ The commodity price projections prepared in April 1995 will be used for the analysis in this paper, since these were available when the estimates and projections contained in this paper were originally prepared. The WEO commodity price projections were updated in October 1995. The October 1995 update reflects the recent sharp increases in world wheat prices (US$ per metric ton):

|          | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|----------|------|------|------|------|------|------|------|
| April:   | 150  | 144  | 138  | 141  | 142  | 144  | 145  |
| October: | 150  | 176  | 185  | 160  | 142  | 144  | 146  |

However, price projections in the year 2000 did not change appreciably from the earlier April 1995 forecast. Since this paper reports only the results of projections in the year 2000, these results would not change appreciably if the October 1995 WEO projections were used instead of the April 1995 projections. For instance, under Scenario II, the total change in net imports of the four food categories analyzed for all 57 countries in the main paper, plus the change for the 12 low-income food deficit Asian and FSU countries analyzed in Appendix II, would fall from US$523 million based on the April 1995 price projections, to US$520 million based on the October 1995 projections. Detailed revised projections based on the October 1995 projections are therefore not reported in this paper.

Trade volumes will be projected to grow in line with demand. Import volume will be projected to grow in line with economic activity in developing countries, based on the WEO projections. Export volume was equal to zero for many country/commodity combinations in the sample during 1993. In these instances, export volumes will be set equal to zero for the entire projection period. If exports were positive in 1993, export volume will be projected to grow in line with economic activity in partner countries. For many developing countries, the most important trading partners are the industrial countries. Accordingly, export volume will be projected to grow in line with economic activity in the industrial countries, again based on the WEO projections. For some developing countries with substantial exports to other developing countries, this may understate export growth since developing countries are projected to grow more quickly than the industrial countries. In any event, food exports were very small during 1993 for the developing countries and commodities considered, so the potential for understatement is small.

Given the baseline path of net food imports during 1994-2000, the incremental effect of the Uruguay Round Agreement on Agriculture will be estimated by reducing net food imports by the percentage changes in world food prices obtained by Goldin and van der Mensbrugghe (1995) in Scenarios I and II, which were displayed in Table 6. The latter study and its various scenarios were extensively discussed in Section III.3 above, along with the rationale for focusing exclusively on Scenarios I and II.

The changes in world commodity prices that will be incorporated into the projections are shown in Table 8. To illustrate, under Scenario I, the cumulative increase in world wheat prices during 1994-2000 absent the Round would be 2.0 percent; this represents the percentage change in price between 1993 and 2000 absent the Round. The incremental effect of the Round under Scenario I would be to increase wheat prices by 1.2 percent between 1993 and 2000; world wheat prices are expected to increase by an additional 1.2 percentage points between 1993 and 2000 due to the Round. The total change (including the effects of the Round) in wheat prices would then be 3.2 percent.

Under Scenario II, world wheat prices are projected to fall by 0.6 percent during 1994-2000 absent the Round. The effects of the Agreement on Agriculture are expected to increase world wheat prices by 3.8 percentage points under Scenario II. Including the effects of the Round, world wheat prices are projected to increase by a total of 3.2 percent over the 1994-2000 period.

## 2.   Results

A comparison of baseline and counterfactual scenarios (Scenarios I and II) for the 57 developing countries analyzed shows that increases in net food import costs expected to result from implementation of the Uruguay Round Agreement on Agriculture accounted for only a small proportion (less than 5 percent) of net food imports, although the absolute amounts were

Table 8.  Price Changes during 1994-2000, with and without
the Impact of the Uruguay Round

(percentage changes)

| | Scenario I | | Scenario II | | Baseline Scenario |
|---|---|---|---|---|---|
| Product | Price changes during 1994-2000 without the Round | Incremental effect of the Uruguay Round | Price changes during 1994-2000 without the Round | Incremental effect of the Uruguay Round | Price changes during 1994-2000 with the Round |
| Wheat | 2.04 | 1.2 | -0.56 | 3.8 | 3.24 |
| Rice | 22.37 | -1.5 | 21.77 | -0.9 | 20.87 |
| Cereals (Coarse grains) | 9.29 | 0.1 | 7.09 | 2.3 | 9.39 |
| Sugar | 31.74 | -1.0 | 28.94 | 1.8 | 30.74 |

Source:  Goldin and van der Mensbrugghe (1995), Table 3, page 28, and staff estimates.

considerable for a few of the larger countries. A summary of the main results is presented in Table 9 for Scenario II, since this scenario provides an upper bound on the likely effects. Detailed results for Scenarios I and II are contained in Appendix Tables 16 and 17. Appendix II contains results for an additional seven Asian and FSU countries that were not selected for inclusion in the sample of 57 countries but nonetheless import substantial amounts of cereals.

The most striking result is that the relative changes in net food imports due to the Round were small, with increases in food import costs ranging up to 4.0 percent of net food imports for Ethiopia. As a percentage of gross food imports (including all food except fish), the percentage increases were even smaller, ranging up to 2.7 percent for Ethiopia. These results stem from the modest increases in world food prices that are expected to result from agricultural trade liberalization, as discussed previously (Table 8).

In U.S. dollar terms, and measured following full implementation of the Agreement on Agriculture in the year 2000, effects were substantial for several of the larger food importers (Albania, Algeria, Egypt, Ethiopia, Morocco, Mexico, Nigeria, Peru, and Yemen), albeit small in percentage terms. For these countries, the increase in net food imports exceeded US$10 million, measured at trade prices and volumes expected to prevail in the year 2000.

Estimated effects of the Agreement on Agriculture were even smaller under Scenario I, since this included smaller price increases than under Scenario II (Table 8). Under this scenario, only Algeria and Egypt face increases in net food import costs in excess of US$10 million, although these represent small percentage changes (less than 1 percent of net food imports). In fact, since prices of rice and sugar are both expected to fall as a result of the Round under Scenario I, 38 of the 57 countries are expected to benefit from the price changes due to the Uruguay Round Agreement on Agriculture.

Table 10 provides some examples that illustrate how the commodity composition of net food imports influenced the estimated effects of changes in food prices due to the Round. Under Scenario I, prices of wheat and coarse grains are expected to rise due to the Round, while prices of rice and sugar are expected to decline. Algeria is projected to be a net importer of each of the four commodities in the year 2000, but net imports of wheat are projected to be much larger than net imports of the other three commodities. Accordingly, the increase in net wheat imports more than offset the decreased net imports of rice and sugar, so the cost of Algeria's net food imports in these four commodities rose.

Egypt is also expected to be affected primarily by the wheat price increase due to the Round. However, Egypt is projected to remain a net exporter of rice, so a price drop would reduce the value of its exports, which is shown by the increase in (negative) net imports of Egyptian rice.

Table 9.  Impact of the Uruguay Round on Food Imports,
Assuming Price Changes in Scenario II

| | Uruguay Round Scenario - Scenario II, total (in millions of dollars) | Relative Change: 1/ (Sum/Net Food Imports) (percent) | Relative Change: 2/ (Sum/Food Imports) (percent) |
|---|---|---|---|
| Algeria | 56.05 | 3.69 | 1.53 |
| Angola | 2.49 | 1.54 | 0.54 |
| Benin | 1.05 | 1.22 | 0.58 |
| Botswana | 1.29 | 1.90 | 0.32 |
| Burkina Faso | -0.12 | -0.18 | -0.09 |
| Burundi | 0.37 | 3.31 | 1.01 |
| Cameroon | 2.07 | 2.71 | 0.86 |
| Cape Verde | 0.41 | 1.39 | 0.59 |
| Central African Republic | 0.45 | 3.50 | 0.93 |
| Chad | 0.57 | 2.14 | 1.71 |
| Comoros | -0.01 | -0.05 | -0.03 |
| Congo | 1.67 | 2.49 | 0.73 |
| Côte d'Ivoire | 0.78 | 0.27 | 0.13 |
| Djibouti | 0.35 | 1.41 | 0.41 |
| Egypt | 58.08 | 3.84 | 1.85 |
| Equatorial Guinea | 0.04 | 0.87 | 0.23 |
| Ethiopia 3/ | 12.56 | 3.98 | 2.72 |
| Gabon | 0.47 | 1.10 | 0.21 |
| Gambia, The | 1.21 | 1.35 | 0.89 |
| Ghana | 4.08 | 1.80 | 1.07 |
| Guinea | 1.20 | 0.81 | 0.49 |
| Guinea-Bissau | -0.27 | -0.78 | -0.60 |
| Kenya | 5.10 | 3.06 | 1.38 |
| Lesotho | 1.36 | 2.69 | 0.66 |
| Liberia | -0.64 | -0.73 | -0.47 |
| Madagascar | 0.81 | 2.74 | 0.98 |
| Malawi | 4.72 | 2.66 | 2.09 |
| Mali | 0.99 | 1.51 | 0.72 |
| Mauritania | 2.77 | 2.15 | 1.35 |
| Mauritius | 0.98 | 1.40 | 0.30 |
| Morocco | 29.35 | 3.85 | 1.91 |
| Mozambique | 3.69 | 1.99 | 1.26 |
| Namibia | 1.88 | 2.28 | 0.98 |
| Niger | 1.07 | 1.33 | 0.74 |
| Nigeria | 18.98 | 2.26 | 1.25 |
| Rwanda | 1.02 | 2.54 | 0.88 |
| São Tomé and Príncipe | 0.08 | 1.45 | 0.79 |
| Senegal | 1.46 | 0.60 | 0.25 |
| Seychelles | 0.14 | 1.25 | 0.29 |
| Sierra Leone | -0.07 | -0.09 | -0.04 |
| Somalia | 1.61 | 1.52 | 1.18 |
| South Africa | 0.28 | 0.13 | 0.02 |
| Sudan | -0.76 | -2.26 | -0.23 |
| Swaziland | 0.05 | 0.59 | 0.04 |
| Tanzania | 0.78 | 0.88 | 0.44 |
| Togo | 0.45 | 2.21 | 0.78 |
| Uganda | 0.05 | -6.58 | 0.07 |
| Zaïre | 2.27 | 2.10 | 0.77 |
| Zambia | 2.15 | 2.96 | 1.74 |
| Zimbabwe | 3.66 | 2.53 | 1.15 |
| Haiti | 2.96 | 1.55 | 0.88 |
| Jamaica | 3.42 | 2.13 | 0.83 |
| Mexico | 36.75 | 2.70 | 0.46 |
| Peru | 16.51 | 2.20 | 1.31 |
| Yemen | 21.31 | 2.87 | 1.82 |
| Albania | 10.13 | 3.37 | 2.08 |
| Kiribati | 0.03 | 0.56 | 0.21 |

1/  Sum of changes in net food imports divided by total net food imports in 2000 (Uruguay Round Scenario).
2/  Sum of changes in net food imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/  1992 Data.

Table 10. Changes in Net Food Imports in the Year 2000 due to the Uruguay Round

| | Uruguay Round Scenario - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 0.44 | 14.80 | -0.47 | -0.60 | 14.16 | 1520.10 | 0.93 | 3656.53 | 0.39 |
| Egypt | 0.48 | 14.39 | 1.00 | -1.43 | 14.44 | 1514.28 | 0.95 | 3139.55 | 0.46 |
| South Africa | -0.22 | 2.51 | -4.06 | 0.13 | -1.64 | 220.27 | -0.75 | 1679.66 | -0.10 |
| Sudan | -0.08 | 0.97 | -1.47 | 0.58 | -0.01 | 33.58 | -0.03 | 334.34 | -- |

| | Uruguay Round Scenario - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 9.70 | 45.58 | -0.28 | 1.05 | 56.05 | 1520.10 | 3.69 | 3656.53 | 1.53 |
| Egypt | 10.65 | 44.34 | 0.60 | 2.49 | 58.08 | 1514.28 | 3.84 | 3139.55 | 1.85 |
| South Africa | -4.79 | 7.72 | -2.43 | -0.22 | 0.28 | 220.27 | 0.13 | 1679.66 | 0.02 |
| Sudan | -1.85 | 2.98 | -0.88 | -1.00 | -0.76 | 33.58 | -2.26 | 334.34 | -0.23 |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

More generally, developing countries may experience terms of trade losses as a result of reductions in world agricultural prices due to the Round.

In the case of South Africa, the beneficial effects of reductions in the world price of rice more than offsets the higher cost of wheat imports due to the Round, so that South Africa is expected to pay less for its food imports on net under Scenario I. This conclusion is reversed in Scenario II, however, due to the increased cost of net wheat imports.

Sudan is expected to benefit slightly on net from changes in food prices due to the Round. In Scenario I, expected lower rice prices dominate higher wheat prices so that net food import costs are projected to fall. In Scenario II, the effects of higher wheat prices were offset by increases in prices of coarse grains and sugar, both of which Sudan exports.

These results show that concerns regarding the potential adverse effects of higher world food prices on net food-importing developing countries appear to have been overstated. Even under the more adverse price scenario, the incremental effect of the Uruguay Round Agreement on Agriculture following its full implementation did not increase net food imports by more than 4 percent for any of the 57 countries analyzed. While this amounted to more than US$10 million in several cases, the effects of the Round would be felt only gradually over time as liberalization is phased in over the six-year implementation period. For the seven Asian and FSU countries analyzed in Appendix II, estimated increases in net food imports exceeded US$10 million in all but one country, but this constituted less than 2 percent of total food imports.

## V.  Food aid

Many net food-importing developing countries receive substantial cereals grants, so that estimated increases in net food import costs presented in Section IV above should be adjusted downwards by deducting the amount of food aid. In doing so, account should be taken of the possibility that the implementation of the Uruguay Round Agreement on Agriculture may adversely influence the availability of food aid by reducing food stocks in the industrial countries. Since the Round is likely to lead only to small changes in prices, the negative impact on food stocks is unlikely to be large. This section discusses food aid in connection with the Round, although only limited information is available concerning each country.

Cereals account for roughly 90 percent of food aid. 1/ It is difficult to obtain reliable estimates of food aid as a proportion of total cereals imports. The value of food aid is assessed at prices prevailing in donor countries, which typically exceed prices in recipient countries' markets. Food import data are partly based on customs records; these data

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1/  See Canada (1994), p. 6.

typically record only a portion of food aid. For both of these reasons, the ratio of food aid to total food imports based on existing data may be overstated, leading in some cases to ratios in excess of 100 percent. Notwithstanding these biases, Table 11 provides rough estimates of the shares of food aid in total cereals imports for 53 of the countries analyzed in Section IV above. 1/ Food aid accounted for over 20 percent of total cereals imports in 28 of the 53 countries, with the share over 50 percent in 15 countries.

Regarding the impact of the Uruguay Round Agreement on Agriculture on the availability of food aid, it is important to distinguish the potential effects over the medium term, once the Agreement has been implemented, from the present tight world supply situation. Presently, world market prices for wheat and coarse grains are high and stocks are low, due to factors unrelated to the Round, including notably poor growing seasons in the United States, China, and Russia, and drought-induced production shortfalls in portions of Africa. 2/ However, as the provisions of the Agreement on Agriculture are implemented over a six-year period, subsidy reductions especially by industrial countries may reduce production, lower food stocks, and limit food aid. Since food aid accounts for a small proportion of cereals stocks, 3/ declining stocks do not necessarily imply proportional declines in food aid. Also, the extent of reductions in food stocks due to the Round may not be large even over the medium term, judging from the small estimated price changes obtained by Goldin and van der Mensbrugghe (1995) and discussed in Section III.3 above.

## VI. Conclusions

During the Uruguay Round developing countries expressed concern regarding effects of the Agreement on Agriculture on food import bills. This study attempted to estimate how much net food import costs would rise by the end of the six-year implementation period for 57 countries in each of four product groups (coarse grains, wheat, rice, and sugar). The estimated effects were obtained by forming a medium-term projection of net food imports that incorporated the effects of the Agreement on Agriculture, and then comparing this with an alternative projection that did not incorporate agricultural liberalization commitments specified under the Agreement. These projections were formed for each country and commodity in the sample, using food trade data from the FAO, medium-term projections of commodity prices and demand growth prepared by Fund staff in connection with the WEO exercise, and estimated effects of the Agreement on Agriculture on world food prices contained in Goldin and van der Mensbrugghe (1995).

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1/ Data on food aid were unavailable for the remaining four countries.
2/ FAO (1995).
3/ Food aid represented only 8.4 percent of cereal stocks in developed countries during 1992, according to Canada (1994).

Table 11.   Food Aid in Cereals by Recipient and Commodity Type, 1993

(tons)

| | Food aid | | | | | Total volume of cereals imports | Food aid/ total cereal imports (percent) |
|---|---|---|---|---|---|---|---|
| | Wheat and wheat flour | Rice | Coarse Grains | Blended, fortified | Sum | | |
| Algeria | 6615 | 4548 | 3015 | -- | 14,178 | 5,821,300 | 0.2 |
| Angola | 4290 | 7865 | 68,628 | 6264 | 87,047 | 345,700 | 25.2 |
| Benin | 3000 | 4360 | 18,436 | 1108 | 26,904 | 134,000 | 20.1 |
| Botswana | -- | -- | 7140 | -- | 7140 | 132,900 | 5.4 |
| Burkina Faso | 2000 | 2914 | 26,350 | -- | 31,264 | 120,800 | 25.9 |
| Burundi | 2248 | 2350 | 545 | -- | 5144 | 21,900 | 23.5 |
| Cameroon | -- | -- | -- | -- | -- | 280,700 | -- |
| Cape Verde | 3403 | 5611 | 32,983 | 605 | 42,602 | 52,700 | 80.8 |
| Central African Republic | -- | 36 | 8381 | -- | 8417 | 32,200 | 26.1 |
| Chad | -- | -- | -- | 385 | 385 | 58,800 | 0.7 |
| Comoros | -- | 4150 | 274 | -- | 4424 | 46,100 | 9.6 |
| Congo | 740 | 13,237 | -- | -- | 13,977 | 148,400 | 9.4 |
| Côte d'Ivoire | -- | 38,396 | 21 | -- | 38,417 | 590,400 | 6.5 |
| Djibouti | 10,733 | 5222 | 9946 | 932 | 26,832 | 42,600 | 63.0 |
| Egypt | 464,441 | 843 | -- | -- | 465,284 | 7,205,600 | 6.5 |
| Equatorial Guinea | 2851 | 1927 | -- | -- | 4778 | 11,100 | 43.0 |
| Ethiopia 1/ | 1,020,891 | 770 | 69,095 | 26,741 | 1,117,497 | 1,047,400 | 106.7 |
| Gambia, The | 487 | 4876 | -- | 3236 | 8599 | 86,800 | 9.9 |
| Ghana | 39,726 | 19,036 | 4014 | 6289 | 69,065 | 396,200 | 17.4 |
| Guinea | -- | 43,634 | -- | 123 | 43,757 | 335,300 | 13.1 |
| Guinea-Bissau | 1727 | 7486 | -- | 370 | 9583 | 70,200 | 13.7 |
| Kenya | 161,785 | 7236 | 149,936 | 22,495 | 341,452 | 569,000 | 60.0 |
| Lesotho | 10,000 | -- | 31,870 | -- | 41,870 | 130,800 | 32.0 |
| Liberia | -- | 148,167 | -- | 16,240 | 164,407 | 137,500 | 119.6 |
| Madagascar | 15,129 | 6028 | 1718 | 3955 | 26,830 | 110,500 | 24.3 |
| Malawi | -- | -- | 646,772 | -- | 646,772 | 514,500 | 125.7 |
| Mali | 19,653 | -- | 11,009 | -- | 30,662 | 83,500 | 36.7 |
| Mauritania | 49,710 | 5872 | 23,290 | 2029 | 80,901 | 285,700 | 28.3 |
| Mauritius | 1792 | -- | -- | 89 | 1880 | 239,800 | 0.8 |
| Morocco | 149,293 | 210 | 6270 | -- | 155,773 | 3,652,500 | 4.3 |
| Mozambique | 73,270 | 66,003 | 830,477 | 13,024 | 982,774 | 507,200 | 193.8 |
| Namibia | 10,000 | -- | 17,891 | -- | 27,891 | 141,000 | 19.8 |
| Niger | -- | 1269 | 18,660 | 1838 | 21,767 | 136,400 | 16.0 |
| Rwanda | 2763 | 2605 | 119,652 | 672 | 125,691 | 114,500 | 109.8 |
| São Tomé & Príncipe | 1174 | 2936 | 1734 | 1222 | 7066 | 9100 | 77.6 |
| Senegal | 12,382 | 31,860 | 3687 | -- | 47,929 | 579,000 | 8.3 |
| Sierra Leone | 13,813 | 9504 | -- | 3365 | 26,682 | 136,300 | 19.6 |
| Somalia | 113,007 | 109,376 | 102,811 | 8414 | 333,608 | 277,600 | 146.6 |
| South Africa | -- | -- | -- | -- | -- | 2,275,400 | -- |
| Sudan | 194,289 | -- | 133,745 | 462 | 328,496 | 627,000 | 52.4 |
| Swaziland | -- | -- | 18,581 | 2419 | 21,000 | 55,200 | 38.0 |
| Tanzania | 2000 | 14,363 | 22,728 | -- | 39,091 | 214,900 | 18.2 |
| Togo | 6328 | 72 | 2027 | 1517 | 9945 | 62,700 | 15.9 |
| Uganda | 11,222 | 278 | 58,612 | 31 | 70,143 | 75,800 | 92.5 |
| Zaïre | -- | 2076 | 25,131 | -- | 27,207 | 237,600 | 11.5 |
| Zambia | 32,805 | 2000 | 747,048 | 7650 | 789,503 | 352,800 | 223.8 |
| Zimbabwe | 112,183 | 8470 | 798,257 | 1340 | 920,250 | 538,400 | 170.9 |
| Haiti | 37,128 | 4971 | 9249 | 27,747 | 79,095 | 380,600 | 20.8 |
| Jamaica | -- | 40,095 | 172,462 | -- | 212,557 | 428,600 | 49.6 |
| Mexico | -- | 250 | 42,413 | 404 | 43,067 | 6,222,700 | 0.7 |
| Peru | 237,746 | 16,801 | 54,454 | 23,485 | 332,486 | 1,920,400 | 17.3 |
| Yemen | 79,526 | 18,003 | 3680 | -- | 101,209 | 1,843,400 | 5.5 |
| Albania | 534,705 | 12,270 | 18 | -- | 546,993 | 646,600 | 84.6 |

Source:   WFP (1993) and FAO (1994)

1/   1992 data.

Results obtained in this paper indicate that the impact of higher world food prices due to the Round should be modest in percentage terms, although effects may be more significant in dollar terms for several of the larger net food-importing countries. Estimated increases in net food imports of over US$10 million were obtained for Egypt, Algeria, Mexico, Morocco, Yemen, Nigeria, Peru, Ethiopia, and Albania. Estimated percent changes in net food imports of these four food items were small, ranging up to 4.0 percent for Ethiopia. As a percent of gross food imports (including all food except fish), changes were even smaller, ranging up to 2.7 percent for Ethiopia. Though small in percentage terms, the effects of higher world food prices due to the Round will likely be felt only gradually as liberalization is phased in over the six-year implementation period. Further, these estimates may overstate the impact of the Uruguay Round Agreement on Agriculture on the net food import bills of developing countries, since they were constructed to represent an upper bound on the likely effects. In particular, many developing countries obtain a substantial amount of food in the form of aid, which should be deducted from the estimated changes in net food imports to obtain estimates of incremental financing needs.

In response to concerns expressed by developing countries, the Uruguay Round agreement included a decision that recognized the possibility that certain developing countries may experience short-term difficulties in financing normal levels of commercial food imports, and that these countries may be eligible to draw on the resources of international financial institutions under existing facilities, or such facilities as may be established in order to address such financing difficulties. The results of this study should assist in allaying these concerns. The estimated financing needs appear modest and can be met under existing IMF facilities in conjunction with resources from other multilateral and bilateral agencies.

**FINAL ACT EMBODYING THE RESULTS OF THE
URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS
(Marrakesh, April 15, 1994)**

**DECISION ON MEASURES CONCERNING THE POSSIBLE NEGATIVE EFFECTS
OF THE REFORM PROGRAM ON LEAST-DEVELOPED AND
NET FOOD-IMPORTING DEVELOPING COUNTRIES**

1.   *Ministers recognize* that the progressive implementation of the results of the Uruguay Round as a whole will generate increasing opportunities for trade expansion and economic growth to the benefit of all participants.

2.   *Ministers recognize* that during the reform program leading to greater liberalization of trade in agriculture least developed and net food-importing developing countries may experience negative effects in terms of the availability of adequate supplies of basic foodstuffs from external sources on reasonable terms and conditions, including short-term difficulties in financing normal levels of commercial imports of basic foodstuffs.

3.   *Ministers* accordingly *agree* to establish appropriate mechanisms to ensure that the implementation of the results of the Uruguay Round on trade in agriculture does not adversely affect the availability of food aid at a level which is sufficient to continue to provide assistance in meeting the food needs of developing countries, especially least developed and net food-importing developing countries.  To this end *Ministers agree*:

> (i)   to review the level of food aid established periodically by the Committee on Food Aid under the Food Aid Convention and to initiate negotiations in the appropriate forum to establish a level of food aid commitments sufficient to meet the legitimate needs of developing countries during the reform program;

> (ii)  to adopt guidelines to ensure that an increasing proportion of basic foodstuffs is provided to least developed and net food-importing countries in fully grant form and/or on appropriate concessional terms in line with Article IV of the Food Aid Convention;

> (iii) to give full consideration in the context of their aid programs to requests for the provision of technical and financial assistance to least developed and net food-importing developing countries to improve their agricultural productivity and infrastructure.

4.   *Ministers* further *agree* to ensure that any agreement relating to agricultural export credits makes appropriate provision for differential treatment in favor of least-developed and net food-importing developing countries.

5.    *Ministers recognize* that as a result of the Uruguay Round certain
developing countries may experience short-term difficulties in financing
normal levels of commercial imports and that these countries may be eligible
to draw on the resources of international financial institutions under
existing facilities, or such facilities as may be established, in the
context of adjustment programes, in order to address such financing
difficulties.  In this regard Ministers take note of paragraph 37 of the
report of the Director-General of the GATT (MTN.GNG/NG14/W/35) on his
consultations with the Managing Director of the International Monetary Fund
and the President of the World Bank .

6.    The provisions of this Decision will be subject to regular review by
the Ministerial Conference, and the follow-up to this Decision shall be
monitored, as appropriate, by the Committee on Agriculture.

Implications of Higher World Food Prices
for Low-income Food-deficit Asian and FSU Countries

Since the country sample considered in the paper did not include any Asian or former Soviet Union (FSU) countries, this appendix applies the methodology developed in Section IV.1 to several additional low-income food-deficit Asian and FSU countries that imported substantial amounts of cereals but for which food imports were a small proportion of total imports (less than 20 percent) in 1993. The following six countries together accounted for more than one half the total value of commercial cereals purchases by low-income food-deficit countries, according to the FAO: Afghanistan, Bangladesh, China, Indonesia, Pakistan, and the Philippines. 1/ While food imports constituted a small proportion of total merchandise imports for the East Asian countries in this group during 1993 (China, 3 percent; Indonesia, 5 percent; and the Philippines, 5 percent), this proportion was higher (albeit less than 20 percent) for the other three Asian countries (Afghanistan, 14 percent; Bangladesh, 15 percent; and Pakistan, 13 percent). Among the FSU countries, Uzbekistan also makes particularly large commercial imports of cereals. 2/

Results are shown in Tables 12 and 13 for Scenarios I and II, respectively. It is apparent that estimated changes in net import costs for the four food product groups considered stem primarily from changes in the price of wheat. In Scenario II, which assumes the larger increase in wheat prices due to the Round, increases in the cost of wheat imports exceeded US$10 million in 2000 for six of the seven countries, the exception being Afghanistan. The increase for China was the largest, amounting to nearly US$70 million; however, this was partly offset by increased sugar prices (China is a net exporter of sugar). Although net import costs for the four selected commodities increased by US$50 million (nearly 20 percent), this increase amounted to less than 1 percent of China's total food imports.

Absolute increases in net import costs for the selected commodities were also substantial for Bangladesh (US$15 million), Indonesia (US$36 million), Pakistan (US$38 million), the Philippines (US$21 million), and Uzbekistan (US$40 million); these increases were primarily due to higher world wheat prices. For Pakistan, the increase in net import costs also accounted for a substantial proportion of net imports of the four selected commodities (11 percent). For Bangladesh, Indonesia, the Philippines, and Uzbekistan, however, these changes were small (less than 5 percent) in relation to net imports of the selected commodities. For Afghanistan, both absolute and percent changes were small.

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1/ FAO (July 1995), page 48.
2/ FAO data on food imports (excluding fish) were unavailable for Uzbekistan. However, Fund staff estimates indicate that food stuffs imports accounted for 19 percent of total merchandise imports in 1993.

Table 12. Impact of the Uruguay Round Agreement on Net Imports in the Year 2000,
Assuming Price Changes as in Scenario I

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Afghanistan | -- | 0.72 | -0.69 | -0.33 | -0.30 | 119.90 | -0.25 | 198.91 | -0.15 |
| Bangladesh | -- | 3.89 | -0.18 | -1.89 | 1.82 | 454.69 | 0.40 | 1061.19 | 0.17 |
| China | -0.14 | 21.90 | 5.46 | 10.24 | 37.46 | 262.36 | 14.28 | 8749.60 | 0.43 |
| Indonesia | 0.13 | 10.05 | 1.21 | -1.05 | 10.34 | 853.15 | 1.21 | 2377.69 | 0.43 |
| Pakistan | -- | 10.61 | 8.00 | -0.51 | 18.10 | 348.04 | 5.20 | 2287.69 | 0.79 |
| Philippines | -- | 6.79 | -1.21 | -0.13 | 5.45 | 574.65 | 0.95 | 1731.99 | 0.31 |
| Uzbekistan | -- | 13.19 | -0.48 | -- | 12.71 | 979.81 | 1.30 | ... | ... |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

Table 13. Impact of the Uruguay Round Agreement on Net Imports in the Year 2000,
Assuming Price Changes as in Scenario II

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Afghanistan | -- | 2.20 | -0.41 | 0.58 | 2.37 | 119.90 | 1.98 | 198.91 | 1.19 |
| Bangladesh | -- | 11.99 | -0.11 | 3.29 | 15.18 | 454.60 | 3.34 | 1061.19 | 1.43 |
| China | -3.04 | 67.48 | 3.26 | -17.83 | 49.87 | 262.36 | 19.01 | 8749.60 | 0.57 |
| Indonesia | 2.79 | 30.97 | 0.72 | 1.82 | 36.31 | 853.15 | 4.26 | 2377.69 | 1.53 |
| Pakistan | 0.03 | 32.69 | 4.79 | 0.89 | 38.40 | 348.04 | 11.03 | 2287.69 | 1.68 |
| Philippines | 0.09 | 20.92 | -0.73 | 0.23 | 20.51 | 574.65 | 3.57 | 1731.99 | 1.18 |
| Uzbekistan | -- | 40.65 | -0.29 | -- | 40.36 | 979.81 | 4.12 | ... | ... |

1/  Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/  Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/  Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).

Table 14.  Growth of Production of Selected Agricultural
Commodities, Past and Projected

(percent per annum)

| Commodity | World | | Developing Countries | |
|---|---|---|---|---|
| | 1988-2000 base | 1988-2000 U.R. | 1988-2000 base | 1988-2000 U.R. |
| All commodities | 1.6 | 1.6 | 3.1 | 3.1 |
| Foodstuffs | 1.6 | 1.6 | 3.2 | 3.2 |
| Wheat | 1.7 | 1.6 | 2.7 | 2.9 |
| Rice | 1.8 | 1.8 | 1.9 | 1.9 |
| Total coarse grains | 1.6 | 1.7 | 2.9 | 2.9 |
| Sugar | 1.8 | 1.8 | 2.3 | 2.4 |
| Pig meat | 2.2 | 2.0 | 4.4 | 4.3 |

Source:  FAO (1995), Table 1a, page 4.
Base:  Projections without Uruguay Round effects.
U.R.:  Projections with Uruguay Round effects.

Table 15.  Growth of Imports of Selected Agricultural
Commodities, Past and Projected

(percent per annum)

| Commodity | World | | Developing Countries | |
|---|---|---|---|---|
| | 1988-2000 base | 1988-2000 U.R. | 1988-2000 base | 1988-2000 U.R |
| All commodities | 1.4 | 1.6 | 3.1 | 3.1 |
| Foodstuffs | 1.5 | 1.7 | 3.5 | 3.5 |
| Wheat | 0.2 | -- | 1.9 | 1.3 |
| Rice | 3.2 | 3.8 | 3.5 | 3.7 |
| Total coarse grains | 0.8 | 1.0 | 4.1 | 4.2 |
| Sugar | 1.0 | 1.1 | 1.4 | 1.5 |
| Pig meat | 0.9 | 0.8 | 3.8 | 3.7 |

Source:  FAO (1995), Table 1c, page 6.
Base:  Projections without Uruguay Round effects.
U.R.:  Projections with Uruguay Round effects.

Table 16. Impact of the Uruguay Round Agreement on Net Imports of 57 Countries
in the Year 2000, Assuming Price Changes as in Scenario I

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 0.44 | 14.80 | -0.47 | -0.60 | 14.16 | 1520.10 | 0.93 | 3656.53 | 0.39 |
| Angola | 0.02 | 0.44 | -0.91 | -0.66 | -1.11 | 162.21 | -0.68 | 465.35 | -0.24 |
| Benin | 0.01 | 0.25 | -0.64 | -0.28 | -0.66 | 85.83 | -0.77 | 180.70 | -0.37 |
| Botswana | 0.03 | 0.26 | -0.37 | -0.01 | -0.09 | 67.94 | -0.13 | 398.17 | -0.02 |
| Burkina Faso | -- | 0.11 | -0.98 | -0.05 | -0.91 | 70.17 | -1.30 | 139.68 | -0.65 |
| Burundi | -- | 0.12 | -0.02 | -0.02 | 0.07 | 11.13 | 0.67 | 36.60 | 0.20 |
| Cameroon | -- | 0.65 | -0.31 | -0.09 | 0.25 | 76.55 | 0.33 | 240.63 | 0.10 |
| Cape Verde | 0.01 | 0.04 | -0.16 | -0.15 | -0.26 | 29.71 | -0.89 | 70.19 | -0.38 |
| Central African Republic | -- | 0.13 | -0.01 | -0.03 | 0.09 | 12.77 | 0.70 | 48.09 | 0.19 |
| Chad | -- | 0.17 | -0.14 | -0.06 | -0.03 | 26.53 | -0.11 | 33.06 | -0.09 |
| Comoros | -- | 0.02 | -0.31 | -0.06 | -0.34 | 24.62 | -1.39 | 40.49 | -0.85 |
| Congo | -- | 0.55 | -0.33 | -0.10 | 0.12 | 67.08 | 0.18 | 228.43 | 0.05 |
| Côte d'Ivoire | -- | 0.71 | -3.50 | -0.35 | -3.13 | 286.54 | -1.09 | 624.66 | -0.50 |
| Djibouti | -- | 0.08 | -0.16 | -0.09 | -0.17 | 24.46 | -0.70 | 83.63 | -0.20 |
| Egypt | 0.48 | 14.39 | 1.00 | -1.43 | 14.44 | 1514.28 | 0.95 | 3139.55 | 0.46 |
| Equatorial Guinea | -- | 0.02 | -0.05 | -- | -0.03 | 4.93 | -0.69 | 18.92 | -0.18 |
| Ethiopia 4/ | 0.03 | 3.87 | -0.14 | -0.04 | 3.72 | 315.77 | 1.18 | 461.82 | 0.80 |
| Gabon | -- | 0.23 | -0.44 | -- | -0.21 | 42.85 | -0.48 | 221.01 | -0.09 |
| Gambia, The | -- | 0.17 | -0.49 | -0.57 | -0.89 | 89.47 | -0.99 | 136.14 | -0.65 |
| Ghana | 0.01 | 0.92 | -1.14 | -1.04 | -1.26 | 226.98 | -0.55 | 380.13 | -0.33 |
| Guinea | -- | 0.38 | -1.36 | -0.48 | -1.46 | 147.57 | -0.99 | 242.93 | -0.60 |
| Guinea-Bissau | -- | 0.01 | -0.56 | -0.01 | -0.56 | 34.66 | -1.62 | 44.91 | -1.25 |
| Kenya | 0.04 | 1.43 | -0.46 | -- | 1.02 | 166.49 | 0.61 | 368.99 | 0.28 |
| Lesotho | 0.02 | 0.20 | -0.04 | -0.22 | -0.04 | 50.45 | -0.08 | 206.16 | -0.02 |
| Liberia | -- | 0.04 | -1.40 | -0.05 | -1.42 | 88.18 | -1.61 | 137.38 | -1.03 |
| Madagascar | -- | 0.27 | -0.14 | -- | 0.14 | 29.50 | 0.47 | 82.04 | 0.17 |
| Malawi | 0.20 | 0.11 | -0.03 | 0.07 | 0 35 | 177.82 | 0.20 | 225.96 | 0.15 |
| Mali | -- | 0.17 | -0.34 | -0.40 | -0.57 | 65.31 | -0.87 | 136.32 | -0.42 |
| Mauritania | 0.01 | 0.69 | -0.56 | -0.48 | -0.34 | 128.79 | -0.26 | 205.80 | -0.17 |
| Mauritius | 0.01 | 0.35 | -0.60 | -- | -0.24 | 69.98 | -0.34 | 326.56 | 0.07 |
| Morocco | 0.22 | 7.93 | -0.02 | -- | 8.14 | 762.66 | 1.07 | 1536.98 | 0.53 |
| Mozambique | 0.08 | 0.50 | -0.72 | -0.45 | -0.59 | 185.55 | -0.32 | 292.26 | -0.20 |
| Namibia | 0.03 | 0.05 | -- | -0.63 | -0.55 | 82.35 | -0.67 | 192.01 | -0.29 |
| Niger | -- | 0.29 | -0.59 | -0.27 | -0.57 | 80.64 | -0.70 | 143.92 | -0.39 |
| Nigeria | -- | 4.49 | -2.97 | -3.95 | -2.42 | 838.74 | -0.29 | 1517.53 | -0.16 |
| Rwanda | 0.03 | 0.08 | -0.04 | -0.08 | -0.01 | 39.99 | -0.02 | 115.45 | -0.01 |

| | Uruguay Round - Scenario I Changes by product (in millions of dollars) | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| São Tomé & Príncipe | -- | 0.02 | -0.04 | -0.01 | -0.03 | 5.19 | -0.54 | 9.55 | -0.29 |
| Senegal | 0.01 | 0.81 | -2.73 | -0.22 | -2.14 | 243.58 | -0.88 | 579.75 | -0.37 |
| Seychelles | -- | 0.03 | -0.08 | -0.05 | -0.09 | 11.22 | -0.84 | 48.9ö | -0.19 |
| Sierra Leone | -- | 0.10 | -1.01 | -0.13 | -1.03 | 76.89 | -1.34 | 150.11 | -0.69 |
| Somalia | 0.01 | 0.47 | -0.77 | -0.18 | -0.46 | 105.73 | -0.44 | 136.67 | -0.34 |
| South Africa | -0.22 | 2.51 | -4.06 | 0.13 | -1.64 | 220.27 | -0.75 | 1679.66 | -0.10 |
| Sudan | -0.08 | 0.97 | -1.47 | 0.58 | -0.01 | 33.58 | -0.03 | 334.34 | -- |
| Swaziland | 0.01 | 0.06 | -0.15 | 0.13 | 0.05 | 8.60 | 0.60 | 134.73 | 0.04 |
| Tanzania | 0.01 | 0.31 | -0.89 | -0.05 | -0.62 | 88.92 | -0.70 | 178.04 | -0.35 |
| Togo | -- | 0.12 | -0.09 | -0.08 | -0.04 | 20.60 | -0.22 | 58.52 | -0.08 |
| Uganda | -0.02 | 0.11 | -0.01 | -0.06 | 0.02 | -0.75 | -2.41 | 74.44 | 0.02 |
| Zaïre | 0.01 | 0.73 | -0.65 | -0.08 | -- | 108.22 | -- | 296.50 | -- |
| Zambia | 0.09 | 0.19 | -0.03 | 0.18 | 0.43 | 72.76 | 0.58 | 123.41 | 0.34 |
| Zimbabwe | 0.15 | 0.11 | -0.11 | -- | 0.15 | 144.45 | 0.11 | 316.66 | 0.05 |
| Haiti | -- | 1.05 | -1.47 | -0.32 | -0.74 | 190.35 | -0.39 | 337.35 | -0.22 |
| Jamaica | 0.05 | 0.69 | -0.66 | -0.39 | -0.32 | 160.62 | -0.20 | 410.90 | -0.08 |
| Mexico | 0.96 | 5.36 | -2.35 | -0.22 | 3.75 | 1359.93 | 0.28 | 7959.28 | 0.05 |
| Peru | 0.18 | 3.58 | -3.03 | -1.88 | -1.15 | 750.98 | -0.15 | 1257.98 | -0.09 |
| Yemen | 0.03 | 5.21 | -1.31 | -3.05 | 0.89 | 743.23 | 0.12 | 1170.46 | 0.08 |
| Albania | -- | 2.94 | -0.41 | -0.76 | 1.78 | 300.78 | 0.59 | 487.63 | 0.36 |
| Kiribati | -- | 0.02 | -0.06 | -- | -0.04 | 4.87 | -0.80 | 12.73 | -0.31 |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
4/ 1992 data.

Table 17. Impact of the Uruguay Round Agreement on Net Imports of 57 Countries
in the Year 2000, Assuming Price Changes as in Scenario II

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| Algeria | 9.70 | 45.58 | -0.28 | 1.05 | 56.05 | 1520.10 | 3.69 | 3656.53 | 1.53 |
| Angola | 0.52 | 1.36 | -0.55 | 1.15 | 2.49 | 162.21 | 1.54 | 465.35 | 0.54 |
| Benin | 0.15 | 0.79 | -0.38 | 0.49 | 1.05 | 85.83 | 1.22 | 180.70 | 0.58 |
| Botswana | 0.70 | 0.81 | -0.22 | 0.01 | 1.29 | 67.94 | 1.90 | 398.17 | 0.32 |
| Burkina Faso | 0.03 | 0.35 | -0.59 | 0.08 | -0.12 | 70.17 | -0.18 | 139.68 | -0.09 |
| Burundi | -- | 0.35 | -0.01 | 0.03 | 0.37 | 11.13 | 3.31 | 36.60 | 1.01 |
| Cameroon | 0.08 | 2.02 | -0.19 | 0.16 | 2.07 | 76.55 | 2.71 | 240.63 | 0.86 |
| Cape Verde | 0.12 | 0.12 | -0.09 | 0.27 | 0.41 | 29.71 | 1.39 | 70.19 | 0.59 |
| Central African Republic | -- | 0.41 | -0.01 | 0.05 | 0.45 | 12.77 | 3.50 | 48.09 | 0.93 |
| Chad | 0.03 | 0.52 | -0.08 | 0.10 | 0.57 | 26.53 | 2.14 | 33.06 | 1.71 |
| Comoros | -- | 0.08 | -0.19 | 0.10 | -0.01 | 24.62 | -0.05 | 40.49 | -0.03 |
| Congo | -- | 1.69 | -0.20 | 0.17 | 1.67 | 67.08 | 2.49 | 228.43 | 0.73 |
| Côte d'Ivoire | 0.06 | 2.20 | -2.09 | 0.62 | 0.78 | 286.54 | 0.27 | 624.66 | 0.13 |
| Djibouti | 0.02 | 0.26 | -0.10 | 0.16 | 0.35 | 24.46 | 1.41 | 83.63 | 0.41 |
| Egypt | 10.65 | 44.34 | 0.60 | 2.49 | 58.08 | 1514.28 | 3.84 | 3139.55 | 1.85 |
| Equatorial Guinea | -- | 0.07 | -0.03 | 0.01 | 0.04 | 4.93 | 0.87 | 18.92 | 0.23 |
| Ethiopia 4/ | 0.65 | 11.92 | -0.08 | 0.08 | 12.56 | 315.77 | 3.98 | 461.82 | 2.72 |
| Gabon | 0.01 | 0.72 | -0.26 | -- | 0.47 | 42.85 | 1.10 | 221.01 | 0.21 |
| Gambia, The | -- | 0.52 | -0.29 | 0.99 | 1.21 | 89.47 | 1.35 | 136.14 | 0.89 |
| Ghana | 0.12 | 2.83 | -0.68 | 1.81 | 4.08 | 226.98 | 1.80 | 380.13 | 1.07 |
| Guinea | -- | 1.18 | -0.81 | 0.83 | 1.20 | 147.57 | 0.81 | 242.93 | 0.49 |
| Guinea-Bissau | -- | 0.04 | -0.34 | 0.02 | -0.27 | 34.66 | -0.78 | 44.91 | -0.60 |
| Kenya | 0.95 | 4.42 | -0.27 | -- | 5.10 | 166.49 | 3.06 | 368.99 | 1.38 |
| Lesotho | 0.40 | 0.61 | -0.02 | 0.37 | 1.36 | 50.45 | 2.69 | 206.16 | 0.66 |
| Liberia | -- | 0.11 | -0.84 | 0.09 | -0.64 | 88.18 | -0.73 | 137.38 | -0.47 |
| Madagascar | 0.05 | 0.84 | -0.08 | -- | 0.81 | 29.50 | 2.74 | 82.04 | 0.98 |
| Malawi | 4.53 | 0.32 | -0.02 | -0.11 | 4.72 | 177.82 | 2.66 | 225.96 | 2.09 |
| Mali | -0.04 | 0.53 | -0.20 | 0.70 | 0.99 | 65.31 | 1.51 | 136.32 | 0.72 |
| Mauritania | 0.12 | 2.14 | -0.33 | 0.84 | 2.77 | 128.79 | 2.15 | 205.80 | 1.35 |
| Mauritius | 0.25 | 1.08 | -0.36 | -- | 0.98 | 69.98 | 1.40 | 326.56 | 0.30 |
| Morocco | 4.92 | 24.44 | -0.01 | -- | 29.35 | 762.66 | 3.85 | 1536.98 | 1.91 |
| Mozambique | 1.80 | 1.54 | -0.43 | 0.78 | 3.69 | 185.55 | 1.99 | 292.26 | 1.26 |
| Namibia | 0.64 | 0.14 | -- | 1.09 | 1.88 | 82.35 | 2.28 | 192.01 | 0.98 |
| Niger | 0.08 | 0.88 | -0.35 | 0.47 | 1.07 | 80.64 | 1.33 | 143.92 | 0.74 |
| Nigeria | 0.04 | 13.85 | -1.78 | 6.87 | 18.98 | 838.74 | 2.26 | 1517.53 | 1.25 |
| Rwanda | 0.67 | 0.24 | -0.02 | 0.14 | 1.02 | 39.99 | 2.54 | 115.45 | 0.88 |

| | Uruguay Round - Scenario II Changes by product (in millions of dollars) | | | | | Uruguay Round Scenario net imports | Relative Change 1/ (sum/net imports) | Uruguay Round Scenario food imports 2/ | Relative Change 3/ (sum/food (imports) |
|---|---|---|---|---|---|---|---|---|---|
| | Coarse Grains | Wheat | Rice | Sugar | Sum | (in millions of dollars) | (percent) | (in millions of dollars) | (percent) |
| São Tomé & Príncipe | -- | 0.08 | -0.02 | 0.02 | 0.08 | 5.19 | 1.45 | 9.55 | 0.79 |
| Senegal | 0.21 | 2.49 | -1.63 | 0.39 | 1.46 | 243.58 | 0.60 | 579.75 | 0.25 |
| Seychelles | 0.01 | 0.10 | -0.05 | 0.08 | 0.14 | 11.22 | 1.25 | 48.98 | 0.29 |
| Sierra Leone | -- | 0.32 | -0.61 | 0.22 | -0.07 | 76.89 | -0.09 | 150.11 | -0.04 |
| Somalia | 0.32 | 1.45 | -0.46 | 0.31 | 1.61 | 105.73 | 1.52 | 136.67 | 1.18 |
| South Africa | -4.79 | 7.72 | -2.43 | -0.22 | 0.28 | 220.27 | 0.13 | 1679.66 | 0.02 |
| Sudan | -1.85 | 2.98 | -0.88 | -1.00 | -0.76 | 33.58 | -2.26 | 334.34 | -0.23 |
| Swaziland | 0.17 | 0.20 | -0.09 | -0.23 | 0.05 | 8.60 | 0.59 | 134.73 | 0.04 |
| Tanzania | 0.29 | 0.94 | -0.53 | 0.08 | 0.78 | 88.92 | 0.88 | 178.04 | 0.44 |
| Togo | -- | 0.37 | -0.05 | 0.13 | 0.45 | 20.60 | 2.21 | 58.52 | 0.78 |
| Uganda | -0.36 | 0.32 | -0.01 | 0.10 | 0.05 | -0.75 | -6.58 | 74.44 | 0.07 |
| Zaïre | 0.28 | 2.24 | -0.39 | 0.14 | 2.27 | 108.22 | 2.10 | 296.50 | 0.77 |
| Zambia | 1.90 | 0.58 | -0.02 | -0.31 | 2.15 | 72.76 | 2.96 | 123.41 | 1.74 |
| Zimbabwe | 3.39 | 0.33 | -0.06 | -- | 3.66 | 144.45 | 2.53 | 316.66 | 1.15 |
| Haiti | 0.06 | 3.22 | -0.88 | 0.56 | 2.96 | 190.35 | 1.55 | 337.35 | 0.88 |
| Jamaica | 1.02 | 2.12 | -0.39 | 0.68 | 3.42 | 160.62 | 2.13 | 410.90 | 0.83 |
| Mexico | 21.25 | 16.53 | -1.41 | 0.38 | 36.75 | 1359.93 | 2.70 | 7959.28 | 0.46 |
| Peru | 4.03 | 11.02 | -1.81 | 3.28 | 16.51 | 750.98 | 2.20 | 1257.98 | 1.31 |
| Yemen | 0.73 | 16.05 | -0.78 | 5.31 | 21.31 | 743.23 | 2.87 | 1170.46 | 1.82 |
| Albania | -- | 9.05 | -0.24 | 1.32 | 10.13 | 300.78 | 3.37 | 487.63 | 2.08 |
| Kiribati | -- | 0.06 | -0.04 | -- | 0.03 | 4.87 | 0.56 | 12.73 | 0.21 |

1/ Sum of changes in net imports divided by total net imports in 2000 (Uruguay Round Scenario).
2/ Gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
3/ Sum of changes in net imports divided by gross imports of food excluding fish in 2000 (Uruguay Round Scenario).
4/ 1992 data.

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