THE URUGUAY ROUND AGREEMENT ON AGRICULTURE AND THE INTERNATIONAL TRADE OF SUB-SAHARAN AFRICA

Dean A. DeRosa
Principal Economist, ADR International, Ltd., 200 Park Avenue, Suite 202 Falls Church, Virginia 22046 U.S.A.

This paper discusses the Uruguay Round agreement on agriculture and highlights the incumbent reforms to farm policies in the major industrial countries. The main analysis investigates the implications of the agreement for the international trade of low-income and middle-income countries in Sub-Saharan Africa, for which food imports but also agricultural exports bulk particularly large. Based on consensus estimates of changes in world prices of agricultural commodities resulting from the Uruguay Round, the effects of the Round on Africa's trade are quantified using a simple economic model under alternative assumptions regarding the adjustment of real exchange rates, adoption of economic policy reforms to reduce the bias against agriculture in Africa, and compliance of countries in the region with the Uruguay Round requirement for the tariffication of administered restrictions on imports of agricultural goods.

THE URUGUAY-RONDTE OOREENKOMS OOR LANDBOU EN DIE INTERNASIONALE HANDEL IN SUB-SAHARA AFRIKA

Hierdie artikel bespreek die Uruguay-rondte ooreenkoms oor landbou en stel die kollig op gevolglike hervormings in landboubeleide in die belangrikste nywerheidslande. Die hoofanalise ondersoek die implikasies van die ooreenkoms op die internsasionale handel van lae-inkomste en middel-inkomste lande in Sub-Sahara Afrika vir wie voedselinvoere maar ook landbou-uitvoere besonder belangrik is. Gebaseer op konsensusberamings van veranderings in wêreldpryse vir landbouprodukte in reaksie tot die Uruguay-rondte word die effek van die Rondte op die handel van Afrika gekwantifiseer met behulp van 'n eenvoudige ekonomiese model onder alternatiewe aannames aangaande die aanpassing van reële rentekoerse, aanvaarding van ekonomiese beleidshervormings om die vooroordeel in Afrika teen die landbou te verlaag en voldoening van lande in die streek met die Uruguay-rondte vereiste vir die tariffering van geadministreerde beperkings op die invoer van landbouprodukte.

1. INDUSTRIAL COUNTRY POLICIES, DEVELOPING COUNTRIES, AND WORLD TRADE IN AGRICULTURE

Agriculture occupied center-stage in the recent Uruguay Round of multilateral trade negotiations, which, under the auspices of the General Agreement on Tariffs and Trade (GATT), brought together the differing interests of industrial and less developed countries in promoting greater trade in the world economy, including international trade in services as well as agriculture, for the first time in the forty-year history of the GATT.

The world has witnessed considerable progress during the past half-century in reducing political barriers to trade in manufactures. Achieving more liberal trade in agriculture, however, has proven particularly difficult and elusive.[1] In the major industrial countries, national policies have sought historically to promote self-sufficiency in the domestic production of staple foods, principally through combinations of import controls and subsidies to producers, to increase the profitability of domestic farm and livestock production. These policies have been successful beyond expectations, especially in the European Union (EU) where during the last more than thirty years the Common Agricultural Policy (CAP) has transformed the European Union from a net importer of temperate-zone agricultural commodities and products to a net exporter, as illustrated in Table 1.

The achievements of CAP, however, have been secured at high economic costs to consumers and taxpayers in Western Europe. In addition to its domestic price-raising effects, CAP's administrative and fiscal costs escalated in response to the effective political support for the Common Agricultural Policy (and the European Union itself) provided by producers in the EU's highly-concentrated farm sector. Indeed, through a combination of price-support measures, including particularly the variable levy system to maintain the price level of competing imports of farm products above targetted domestic price levels, the CAP has induced considerable increases in the productivity of Western European farmers and resulted in surpluses of staple foods that must be disposed of through official food aid or export sales at below EU prices (i.e., subsidized exports).

As compounded by similar programs in the United States, the CAP has resulted in substantial distortions to world agricultural trade, through restrictions on agricultural imports but also the "dumping" of agricultural surpluses on world commodity markets. Specifically, it has contributed to lower, and less stable, levels of international prices for the wide range of agricultural commodities covered by EU farm programs, including grains, beef, butter, milk, oilseeds and oilseed products, and sugar. This has placed particular burdens on competitive producers of these commodities in industrial countries such as Australia, New Zealand, Canada, and the United States, as well as many developing countries with a relative abundance of arable land such as Argentina and Mexico in Latin America, Indonesia and Thailand in Asia, and Kenya and Zimbabwe in Sub-Saharan Africa (SSA). Indeed, the countries that were most vocal in their demands for reform of international trade in agriculture during the Uruguay Round were the countries just enumerated, and many of these countries formed a particularly effective bloc in the negotiations, known as the Cairns Group.

Not all developing countries brought pressure to bear for reform of agricultural policies during the Uruguay Round. Many food-importing and low-income developing countries feared that their interests might be threatened by the negotiations on agriculture (and tropical products) on two counts: (a) that global liberalization of agricultural trade would raise their food import costs and possibly reduce bilateral food aid programs, and (b) that successful negotiations would erode trade preferences extended by Japan, the United

Table 1: World wheat production and trade

	1970/71	1975/76	1980/81	1985/86	1990/91
	(millions of metric tons)				
World Production	313.7	356.6	443.0	498.8	588.2
China	29.2	45.3	55.2	87.8	98.2
Russia	99.7	66.2	98.2	78.1	100.3
European Union[1]	41.3	45.1	61.5	71.7	84.7
United States	36.8	57.9	64.8	66.0	74.5
India	20.1	24.1	64.8	44.1	49.9
Canada	9.0	17.1	19.3	24.3	32.1
World Trade	55.0	66.7	94.1	84.9	101.2
Exports					
United States	20.2	31.9	41.2	25.0	28.3
Canada	11.9	12.3	16.3	16.8	20.5
European Union [1 & 2]	3.4	8.4	15.7	15.6	20.7
Argentina	1.0	3.2	3.9	6.1	4.7
Imports					
Russia	0.5	10.1	16.0	15.7	22.3
China	3.7	2.2	13.8	6.6	9.4
Egypt	2.8	3.8	5.4	6.3	5.7
Japan	4.8	5.9	5.8	5.5	5.6
European Union[1 & 2]	9.5	5.4	5.6	2.9	1.5

Sources: Hathaway (1987) and FAS (1994)
[1] Twelve members of the former European Community
[2] Excludes intra-European Union trade.

States, and the European Union under the GATT-sanctioned Generalized System of Preferences (GSP) and Lomé Convention. Thus, however distorted international trade in agriculture had become prior to the Uruguay Round, some developing countries came to view themselves as beneficiaries of the international externalities of the CAP and similar trade-distorting agricultural policies of other industrial countries.

With regard to preferences, less developed countries have not benefitted widely from trade preferences (Baldwin and Murray, 1977; Laird and Sapir, 1987; Davenport, 1992). In agriculture and other primary sectors, preferences are of questionable importance because of the low levels of protection generally enforced on nontemperate-zone commodities by the major industrial countries. Thus, while some low-income countries benefit from preferential quotas on cane sugar exported to the United States and Western Europe, and from special arrangements of the European Union for imports of bananas, cassava, and a limited number of other tropical commodities produced in the so-called ACP (African, Caribbean, and Pacific) countries, the Uruguay Round agreement on agriculture did not treat these commodities extensively, with the possible exceptions of sugar and cassava (a substitute for temperate-zone feed grains).

The remainder of this paper discusses the policy reforms to agriculture under the final agreement of the Uruguay Round and investigates in quantitative terms the implications of the multilateral agricultural reforms for the international trade of Sub-Saharan African countries, for which agricultural exports but also food imports bulk particularly large. These objectives are accomplished in three sections. First, Section 2 discusses the Uruguay Round agreement on agriculture and the centrality of the recent CAP reforms to the final conclusion of the Round. Then, on the basis of simulations of a simple economic model Section 3 considers the implications of the GATT reforms to agriculture for the international trade of a large sample of non-fuel exporting African countries, taking into consideration the importance of complementary reforms to trade and macroeconomic policies in less developed African countries themselves - including the Uruguay Round-mandated tariffication of quantitative restrictions and other non-price barriers against imports of agricultural commodities and goods. Finally, Section 4 briefly considers the future of agriculture in the major industrial countries and Third World given the expectation of continued pressures for fundamental reforms to world production and trade of agricultural goods in connection with the eventual integration in the global trading system of the "transitional" economies of Eastern and Central Europe as well as the greater integration of the economies of many "traditional" developing countries in Africa and other regions.

2. THE URUGUAY ROUND AGREEMENT ON AGRICULTURE

The Uruguay Round posed a number of unprecedented challenges. These included the large number of topics on which negotiations were held (15), the large number of countries participating in the negotiations (over 100), and the inclusion of several new topics for negotiation, including international service transactions, intellectual property rights related to international trade, and, of course, trade in agriculture. The negotiations were also complicated by the international environment in which they were conducted. Arguably, commitment of the

GATT contracting parties to multilateralism declined during the seven years of the trade negotiations, in response to increasing regionalism in the world economy and the changed environment of global security issues in the wake of the fall of communism in Russia, Eastern Europe, and Central Asia.

The negotiations on agriculture were particularly difficult, and on more than one occasion they threatened to bring the entire multilateral trade negotiations to an unsuccessful conclusion. Until the Uruguay Round trade talks began in 1986, agriculture remained mainly outside of the periodic multilateral GATT negotiations to liberalize trade. Indeed, even before adoption of the so-called US agricultural waiver in 1955, which later provided the basis for establishing the GATT-consistency of CAP, the General Agreement on Tariffs and Trade was never enforced in a serious way to limit the widespread use of quantitative restrictions to support the administered systems that regulate production and trade of agricultural goods in many industrial and other high-income countries. Ostensively, this occurred with a view to upholding national food security objectives. The political reality, however, is that highly-concentrated, and hence very effective, vested interests in the agriculture sectors of these countries held considerable power to maintain high levels of domestic support for their output and thus to resist multilateral efforts to liberalize world trade in agriculture.

Agricultural liberalization could not be side-stepped at the outset of the Uruguay Round however, given the steeply rising fiscal costs of price support and export subsidy programs for farm commodities in the European Union and United States. Moreover, the maintenance of high protection for agriculture was increasingly recognized as incongruous with the low protection (on average) for manufactures, achieved through the success of previous rounds of multilateral trade negotiations under GATT.

As mentioned previously, at the outset of the Uruguay Round there were clear divisions of interest among groups of industrial and developing countries in support of either thoroughgoing reform of agriculture (United States and Cairns Group) or more modest objectives in the direction of reform of domestic policies distorting international trade in agriculture (European Union and Japan). These divisions of interest, in fact, proved very difficult to overcome throughout the negotiations, as domestic interest groups standing just behind the Uruguay Round negotiators remained firm in their positions. From the European perspective, political leaders found themselves particularly constrained by, on the one hand, the necessity of introducing fiscal cost-reducing reforms to the CAP and, on the other hand, the perceived necessity of ensuring support of European farmers for ratification of the Maastricht Treaty (establishing the European Union) and for deepening the regional integration of goods and factor markets under the Europe 1992 Plan for a single European market.

An additional difficulty underlying the agricultural negotiations was the close relationship between border measures (export subsidies and import controls), on one hand, and domestic farm and price policies regulating agricultural production, on the other hand. Essentially, the Uruguay Round negotiations could not proceed along traditional lines, namely, to liberalize trade by reducing the levels of tariffs and other protection measures alone. Domestic farm support programs had to be liberalized at the same time, in order to "validate" the reduction of border measures distorting trade in agriculture.

The negotiations came to categorize domestic policies according to two (and later three) "boxes" to which a new empirical measure, termed the aggregate measure of support (AMS), could be applied to assess and monitor the impacts of domestic agricultural policies on international trade.[2] To the first of these boxes, the so-called green box, were assigned domestic policies such as advisory services, domestic food aid and safety-net programs, environmental measures, income support and land set-aside payments. These policies were viewed as nontrade-distorting, because they are largely "de-coupled" from agricultural output. The second major box, the so-called amber box, contained all other domestic support policies, including the EU price maintenance and U.S. deficiency payments systems, and were deemed the proper objects of the Uruguay Round negotiations.

The United States was at some advantage under this framework for the negotiations because its programs involve appreciable reliance on the set-aside requirements that were assigned to the green box of de-coupled support measures. The domestic support programs of the European Union, on the other hand, fit more generally into the amber box, and accordingly the European negotiators resisted the proposals by negotiators from the United States and other agricultural-exporting countries to reduce output-related domestic support measures substantially, i.e., by margins of 50 percent or more.

The other primary elements of the negotiations on agriculture concerned export and import border measures.[3] Concerns for export subsidies were especially important given the competition in costly export subsidies for wheat and other grains that erupted during the 1980s with the adoption of the U.S. Enhanced Export Program, which was instituted to regain the share of U.S. exports in overseas markets for grains lost principally to EU exporters. The negotiations on export subsidies centered on reducing the extent of export volume-related subsidies, using an aggregate measure similar to the AMS applied to domestic support measures. Also again, the lines of disagreement between the United States and EU negotiators were sharply drawn, though both favored some reductions in export subsidies in order to reduce the increasing transparency as well as burden of the fiscal outlays necessary to support export competition.

Finally, the negotiations on import measures sought, commendably, to incorporate a cornerstone of the GATT, namely, that protection measures should be limited to tariffs. The economic rationale for observing this GATT principle is that the price system is more efficient in allocating resources to productive uses and also in enabling consumers to purchase imports without limit. Also, reliance solely upon tariffs to regulate imports results in greater transparency of protection and hence is more amenable to increasing market access in future rounds of multilateral trade negotiations. In practical terms, the negotiators generally looked to forging an agreement that would result in the tariffication of quantitative restrictions and other

new tariff levels (i.e., agreement not to raise tariff rates above bound levels), and the adoption of a schedule by which the new tariff levels could be lowered over a horizon of a limited number of years.

Two developments during 1992-93 were crucial to achieving the Uruguay Round agreement on agriculture. The first was the adoption of substantial reforms to the CAP in mid-1992. The second was the Blair House Accord in late-1992 between the European Union and United States (later refined during "eleventh-hour" negotiations in December 1993), in which agreement was reached to put aside certain differences in the interpretation of their respective agricultural support programs.

In May 1992, in response to the steeply mounting fiscal burdens of the CAP but also the Uruguay Round negotiations themselves, the EU Council of Agricultural Ministers adopted a reform package, based on the so-called MacSharry Plan, covering several major commodities: cereals, protein crops, oilseeds, beef and selected other meats, dairy, and tobacco. These reforms featured the complete removal of domestic price support for oilseeds and the reduction of price supports for the other commodities covered by the reforms. They also featured the introduction of direct compensation payments and mandatory set-asides for large farmers. The latter provisions moved the CAP closer in major respects to the U.S. farm system and to "less-coupled", but not de-coupled, official support from production levels, potentially placing a higher proportion of EU agricultural support measures into the green box.

The Blair House Accord reached in November 1992 settled the most stubborn differences between the European Union and United States concerning the categorization of their agricultural support policies between green and amber boxes. In effect, the bilateral agreement established a third box (the blue box) into which were placed both the U.S. deficiency payments system and the new CAP compensatory payments system, with the understanding that elements of the blue box, along with those already contained in the green box, would be exempt from the AMS calculation and, under a "peace clause", would not be subsequently contested through the GATT dispute procedures by either party. The rationale for this compromise was that both major programs, though still linked in part to output levels, are predominantly production-limiting programs, based on fixed area and yield factors.

With the Blair House Accord and subsequent agreement by Japan and Korea to liberalize (over an extended period) their controls on rice imports, the Uruguay Round negotiations were finally concluded in December 1993. A summary of the principal elements of the agreement on agriculture is provided in Table 2. Under **market access**, the major accomplishment of the agreement is the tariffication of all NTBs and the stipulation of a 36 percent reduction, on average, of bound tariff rates over the 6-year period of the agreement. Under lax rules, high tariff equivalent rates of protection were bound by many countries (Ingco, 1995). Circumventing this problem in part is the requirement that minimum access be guaranteed for previously restricted import categories, amounting to 3 percent of domestic consumption initially and 5 percent at the end of the implementation period. (Ironically, the minimum access requirement promotes the establishment of tariff-rate quota systems in direct contradiction of GATT principles.) Under **domestic subsidies**, the farm support policies remaining in the amber box after the Blair House Accord are subject to a reduction of only 20 percent, based on AMS calculations, over the horizon of the agreement. And

Table 2: Key elements of the Uruguay Round agreement of agriculture

	Rules	Liberalization	Safeguards, Accommodations, and Guarantees
Market Access	-- Change non- tariff import barriers to tariffs -- Establish tariff quotas -- Bind all import tariffs	-- Reduce existing and new import tariffs by 36% on average over 6 years -- Reduce import tariffs for each item by 15%	-- Guaranteed access opportunities for exporters through tariff-rate quotas -- Special safeguard measures for importers
Domestic Subsidies	-- "Green box" defined for allowable production subsidies	-- Reduce expenditures on trade-distorting production subsidies by 20% over 6 years	-- Many developing countries' subsidies exempted -- Payments under production limiting programs exempted
Export Competition	-- Defined limits on existing export subsidies -- No new export subsidies	-- Reduce expenditures on export subsidies by 36% over 6 years -- Reduce volume of subsidized exports by 21% over 6 years	-- Adherence to food aid rules -- Negotiate later on export credits

Source: Josling et al. (1994).

Notes: Reduction amounts are for developed countries. Actual reductions are as agreed in country "schedules" of the Agreement, and differ somewhat from "target" levels in the table.

finally, under **export competition**, expenditures on subsidies and the volume of subsidized exports must be reduced by 36 percent and 21 percent, respectively, over the period of the agreement.

These terms apply mainly to industrial countries and advanced developing countries. For other developing countries the provisions of the Uruguay Round agreement on agriculture are less stringent, under the rubric of "special and differential treatment" for less developed countries. In the main, the period of adjustment to the new multilateral trading regime in agriculture is extended to 10 years. Also, subsidies accorded to food and agriculture sectors for "development purposes" are exempt from coverage. Thus, with the exception of tariffication, the requirements for compliance to the terms of the new agreement by less developed countries are very limited.

Early estimates of the impacts of thoroughgoing liberalization of industrial-country farm policies, based on simulations of multi-sector partial equilibrium and general equilibrium models, indicated that the total volume of world trade in agriculture would expand by about 25 percent, with an accompanying increase in the aggregate level of world prices for agricultural products of 10-15 percent (e.g., Burniaux *et al.*, 1990; UNCTAD/WIDER, 1990). Under the terms of the new agriculture agreement, the changes in international trade and prices will be considerably smaller. With regard in particular to prices, recent estimates more in accord with the final outcome of the Uruguay Round suggest that, *ceteris paribus*, the medium- to long-term increase in world prices for agricultural commodities will not be more than 2-5 percent in the aggregate and 5-10 percent for some commodities such as wheat, sugar, and dairy products (Table 3).

These lowered expectations may be disappointing, but many agricultural and trade policy analysts point to the success of the Uruguay Round negotiations in finally bringing agriculture into greater conformity with the basic principles of the GATT and to the potential of future multilateral trade negotiations for achieving greater liberalization of trade in agriculture (e.g, Josling *et al.*, 1994; Sanderson, 1994). Against this view, however, must be weighed the view of critics who point to the unabated strength of administered arrangements in agriculture, left in place by the Uruguay Round agreement, "dirty tariffication" of NTBs, and creation of new administered arrangements in the case of the tariff-rate quotas mandated under the market access provisions of the new agreement. To these critics, future negotiations to liberalize trade in agriculture will continue to be hindered by the still effective political consensus in favor of agricultural support programs in

Table 3: Simulated effects of agricultural trade liberalisation on world prices

Commodity	Price change				
	UNCTAD/ WIDER (1990)	Page *et al.* (1991)	FAPRI (1993)	Brandao and Martin (1993)	Goldin *et al.* (1993
	(percent)				
Temperate zone products					
Wheat	7.5	5.0	6.3	6.3	5.9
Coarse Grains	3.4[a]	1.8	2.4	4.4	3.6
Rice	18.3	1.2	4.4	4.2	-1.9
Meat	13.0	5.3	0.5	6.1[f]	4.7[h]
Sugar	10.6	5.0	–	10.2	10.2
Soybeans	0.0	–	4.52[c]	–	
Soybean oil	0.1	–	3.8	–	4.1[j]
Dairy products	–	9.3		10.1	7.2
Tropical products					
Coffee	0.4[b]	0.8	–	0.41	-6.1
Cocoa	0.0[e]	1.0	–	0.14	-4.0
Tea	0.5	–	–	2.34	3.0
Tobacco	0.3[d]	–	–	–	–
Cotton	0.9	–	–	2.23	3.7
Groundnuts	1.5	–	–	4.52[g]	–
Groundnut oil	0.6	–	–	–	4.1[j]
Plants and Flowers	–	1.0	–	–	–
Spices	–	0.2	–	–	–

Source: FAO (1994).

Notes: The price changes are estimates derived from simulations of the global economic models indicated.
[a] Simple average of maize and sorghum.
[b] Refers to beans; for roasted, 0.0 percent, and for coffee extracts, 1.4 percent.
[c] Refers to beans; for butter, 0.5 percent; for powder, 0.8 percent; and for chocolate, 1.8 percent.
[d] Refers to leaves; for cigarettes, 0.1 percent, and for cigars, 0.8 percent.
[e] Refers to butter.
[f] Refers to beef, veal and sheepmeat; for other meats, 3.1 percent.
[g] Refers to all oilseeds.
[h] Refers to beef, veal and sheepmeat.
[j] Refers to all vegetable oils.

the major industrial countries.

3. THE INTERNATIONAL TRADE OF SUB-SAHARAN AFRICA

The reform of agricultural policies in the European Union and other industrial countries under the Uruguay Round agreement should be expected to have differing effects on developing countries and their international trade, depending upon the structure of each country's economy and trade flows but also the stance of each country's macroeconomic and trade policies. The countries of Sub-Saharan Africa present an interesting and important group of less developed countries for consideration in these regards. In the main, the economies of these countries are highly dependent upon agriculture, with the sector providing not only a high proportion of employment but also export earnings. The terms and conditions of international trade in food commodities are also of particular importance to these countries, because many countries in Sub-Saharan Africa are food-deficit countries. As such, these countries frequently face difficulties in meeting domestic demands for staple foods, through domestic production or food imports financed by their export earnings, without recourse to international food aid.[4]

The implications of the Uruguay Round agreement on agriculture are considered here with reference to the recent trade in agriculture and other goods of 42 non-fuel exporting countries of Sub-Saharan Africa, which may be divided into 31 low-income countries and 11 middle-income countries (Table 4). In value terms, during 1990-92 agricultural commodities and products accounted for 20 percent of the total exports and 13 percent of the total imports of the group of 42 countries. The importance of agricultural trade for the group of low-income countries is substantially greater however; agricultural goods accounted for 38 percent of total exports and 19 percent of total imports.

Foods, including livestock and meats, account for a large share of agricultural exports (67 percent) and especially agricultural imports (76 percent). Cereals, including maize in addition to wheat and rice, comprise the largest share of food imports (55 percent for the low-income countries), but only a small share of food exports (less than 5 percent in most cases). Finally, the 31 low-income countries in Sub-Saharan Africa are all low-income food deficit (LIFD) countries and, thus, are of special interest to international policymakers, including in connection with the Uruguay Round agreement which commits the major industrial countries to continue the provision of international food aid to ensure that the LIFD countries are not adversely affected by the multilateral reforms to agricultural policies.

The Uruguay Round reforms to agriculture should be expected to impact favorably upon the export prospects of agricultural-exporting countries (through increased market access and higher international prices) and unfavorably upon the import costs of food deficit countries (as a result of higher world food prices). Thus, the recent reforms are something of a double-edged sword, providing the potential for both economic benefits and economic costs to developing countries, depending in the first instance upon the nature and extent of each country's trade in agriculture. Indeed, concern has been widely voiced for the potential burdens that the global agricultural policy reforms might place on LIFD countries worldwide and particularly in Sub-Saharan Africa. However, a number of the LIFD countries, including, for example, Ghana, Kenya, Rwanda, Sudan, and Tanzania, are also classified as exporters of agricultural goods, and hence they should also be expected to enjoy economic gains as a result of the Uruguay Round agreement, namely, from increased earnings from their exports of agricultural commodites.

The medium- to long-term implications of the global reforms to agriculture can be assessed for the agricultural and other trade prospects of the Sub-Saharan African countries in Table 4, using "consensus" estimates of the effects of the Uruguay Round agreement on world prices of temperate zone and tropical commodities derived from the estimates presented in Table 3 and a simple, partial equilibrium model of Africa's international trade. The applied economic model, which is described in the Appendix, incorporates parameter values for price elasticities of import demand and export supply but also parameter values for the extent of quantitative restrictions and other administered protection measures (that is, nontariff barriers) in the several African countries covered by the model. Finally, the quantitative model also allows for the influence of changes in the real exchange rate between traded and nontraded goods in response to both the liberalization of world trade in agriculture and reforms to domestic economic policies[5]

The simulation results for the SSA countries considered in Table 4 are presented in Tables 5-7. As discussed in what follows, the results correspond to different assumptions about the path of adjustment of trade and other economic policies in Sub-Saharan Africa in the wake of the Uruguay Round agreement.

4. IMPACT EFFECTS AND EFFECTS WITH EXCHANGE RATE ADJUSTMENT

The "impact effects" of the Uruguay Round agreement on the international trade of the SSA countries are seen in Table 5. The impact effects depict the changes in trade volumes and values resulting only from the effects of the agreement on world prices of agricultural commodities, including tropical products.

It is apparent that the outcome of the GATT agricultural negotiations implies appreciable benefits to a number of SSA countries. Indeed, for the entire sample of countries agricultural exports are simulated to expand by more than agricultural imports, reflecting the essential fact that Sub-Saharan Africa is an agricultural-exporting region. This is particularly the case for the middle-income countries of the region, whose agricultural exports and imports are estimated to increase by US$223 million (4.5 percent) and US$68 million (2.6 percent), respectively. Among the LIFD countries, however, only 10 countries (Benin, Burkina Faso, Chad, Madagascar, Malawi, Mali, Sudan, Tanzania, Togo, and Uganda) are found to have improved trade balances, and for the group as a whole the estimated increase in agricultural imports (US$148 million or 4.1 percent) is nearly two times larger than the estimated increase in earnings from agricultural exports (US$85 million or 2.1 percent). Finally, in accord with concerns for the impact of the Uruguay Round on low-income food-importing countries, the simulation results indicate that increases in export earnings are insufficient to cover the higher costs of

Table 4–International Trade of Sub-Saharan African Countries, 1990-92

Non-Fuel Exporting African Countries	Exports							Imports						
		Agricultural Goods							Agricultural Goods					
	All Goods	All Agricultural Goods	Food and Live Animals		Beverages and Tobacco	Crude Materials	Fats and Oils	All Goods	All Agricultural Goods	Food and Live Animals		Beverages and Tobacco	Crude Materials	Fats and Oils
			All	Cereals						All	Cereals			
	(in millions of U.S. dollars, 1990-92 average)													
All Countries	44,466	9,073	6,059	308	867	1,887	259	47,005	6,217	4,744	2,479	535	341	597
Low-income Countries	10,811	4,143	2,441	53	357	1,212	133	18,665	3,608	2,862	1,605	280	65	401
Benin	275	104	8	5	...	92	4	640	116	87	46	27	...	2
Burkina Faso	326	140	23	...	...	116	0	580	106	94	54	8	1	4
Burundi	80	75	68	0	2	5	...	238	24	21	13	1	1	1
Cent Afr Rep	136	40	23	...	1	15	0	148	41	34	12	5	0	2
Chad	201	117	37	...	...	80	0	407	25	23	12	2	...	0
Comoros	21	16	16	...	...	0	...	59	20	18	10	2	...	1
Eq Guinea	36	4	4	...	...	...	...	63	15	8	3	5	...	2
Ethiopia	239	193	133	...	0	59	1	661	247	192	161	10	8	36
Gambia	48	12	3	...	...	7	2	206	85	68	22	12	0	6
Ghana	972	349	341	...	0	5	2	1,343	205	182	76	7	10	6
Guinea	699	26	23	...	...	4	0	713	161	117	63	34	...	10
Guinea-Bissau	15	11	10	...	...	2	0	83	29	22	18	4	...	3
Kenya	1,173	657	578	11	8	71	1	1,948	204	132	77	6	10	55
Lesotho	65	13	7	4	0	6	...	646	144	117	43	19	1	8
Madagascar	323	158	146	3	0	12	0	495	65	45	35	2	1	17
Malawi	430	400	81	1	309	10	0	688	79	66	58	3	2	8
Mali	359	262	87	3	...	168	6	656	120	108	36	10	0	2
Mauritania	443	43	41	...	...	1	...	218	144	131	51	4	0	9
Mozambique	155	43	27	...	...	15	1	887	222	177	138	6	4	36
Niger	353	63	55	0	4	4	...	499	120	91	38	13	2	13
Rwanda	90	80	75	...	0	5	...	294	46	31	17	2	1	12
São Tome Prn	14	3	3	...	...	0	...	31	6	4	2	1	0	0
Senegal	720	182	45	0	3	37	97	1,343	432	345	157	30	6	51
Sierra Leone	146	19	16	...	2	0	0	156	100	88	49	7	0	5
Somalia	82	38	35	...	...	3	...	367	90	80	66	2	...	8
Sudan	480	433	134	7	...	285	13	921	261	204	133	6	3	48
Tanzania	396	264	147	5	19	97	1	1,477	99	63	42	2	1	32
Togo	279	107	42	8	0	62	3	608	109	73	32	30	0	6
Uganda	167	159	134	4	4	21	...	535	25	12	4	2	...	11
Zaire	876	100	82	...	...	17	1	765	199	171	90	14	8	5
Zambia	1,209	32	17	0	4	12	0	991	69	56	48	3	4	6
Middle-income Countries	33,655	4,930	3,619	255	510	676	126	28,340	2,608	1,882	874	255	276	195
Botswana	2,204	90	85	0	0	3	2	2,313	147	112	27	22	2	11
Cape Verde	9	2	2	...	0	0	...	137	49	37	13	5	0	6
Côte d'Ivoire	2,932	1,614	1,323	7	5	202	84	2,085	417	372	172	28	8	10
Djibouti	21	8	7	...	...	1	...	218	91	56	24	12	19	5
Liberia	200	41	4	...	...	35	1	123	83	72	50	5	1	4
Mauritius	1,220	385	379	1	1	5	0	1,601	204	158	53	8	22	16
Namibia	1,178	123	118	...	...	5	...	1,287	110	103	14	...	8	...
Seychelles	49	1	0	...	0	0	...	183	31	25	8	4	0	2
South Africa	23,661	1,645	1,212	181	74	324	34	17,532	1,197	742	394	155	183	116
Swaziland	567	327	305	1	6	17	...	721	98	80	22	10	5	2
Zimbabwe	1,614	695	185	65	423	83	3	2,139	182	126	99	5	28	23
Memorandum Items														
Developing Countries	890,857	90,822	60,702	6,902	7,735	15,862	6,523	872,555	89,265	59,288	22,138	8,215	14,993	6,769
World	3,618,852	335,531	230,702	46,824	42,810	48,403	13,616	3,716,029	362,924	254,640	50,813	39,710	53,635	14,939

Sources FAO (1992) and IMF (1993).

Notes Low-income countries are countries with per capita incomes of less than $426 in 1986, as defined by the International Monetary Fund. Agricultural goods include food and live animals (SITC 00-09, excluding 03), cereals (SITC 04), beverages and tobacco (SITC 11-12), crude materials (SITC 21-22,232,26,29), and fats and oils (SITC 41-43).

Table 5 — Changes in Trade with No Exchange Rate Adjustment or Tariffication

Non-Fuel Exporting African Countries		Real Exchange Rate	Exports: All Goods	Exports: Agricultural Goods: All Agricultural Goods	Exports: Agricultural Goods: Food and Live Animals	Exports: Agricultural Goods: Beverages and Tobacco	Exports: Agricultural Goods: Crude Materials	Exports: Agricultural Goods: Fats and Oils	Imports: All Goods	Imports: Agricultural Goods: All Agricultural Goods	Imports: Agricultural Goods: Food and Live Animals: All	Imports: Agricultural Goods: Food and Live Animals: Cereals	Imports: Agricultural Goods: Beverages and Tobacco	Imports: Agricultural Goods: Crude Materials	Imports: Agricultural Goods: Fats and Oils
		(in percent)	(in millions of U.S. dollars, 1990-92 baseline)												
All Countries		0.0	307.8 (0.7)	307.8 (3.4)	221.3	4.8	70.0	11.8	216.5 (0.5)	216.5 (3.5)	201.2	126.0	0.7	4.2	10.4
Low-Income Countries		0.0	85.2 (0.8)	85.2 (2.1)	28.3	2.1	48.5	6.3	148.2 (0.8)	148.2 (4.1)	138.6	87.4	0.5	1.0	8.1
Benin		0.0	5.2 (1.9)	5.2 (5.0)	0.6	...	4.4	0.2	4.1 (0.6)	4.1 (3.6)	4.0	2.5	0.0	...	0.0
Burkina Faso		0.0	5.1 (1.6)	5.1 (3.8)	0.0	...	5.0	0.0	4.5 (0.8)	4.5 (4.3)	4.4	3.0	0.0	0.0	0.1
Burundi	##	0.0	0.2 (0.3)	0.2 (0.3)	0.1	0.0	0.0	...	1.2 (0.5)	1.2 (4.9)	1.1	0.7	0.0	0.0	0.0
Cent Afr Rep	##	0.0	0.6 (0.5)	0.6 (1.6)	0.0	0.0	0.6	...	1.3 (0.9)	1.3 (3.1)	1.2	0.7	0.0	0.0	0.0
Chad		0.0	3.7 (1.8)	3.7 (3.1)	0.0	...	3.6	0.0	1.2 (0.3)	1.2 (4.8)	1.2	0.6	0.0	...	0.0
Comoros	##	0.0	0.0 (0.2)	0.0 (0.2)	0.0	...	0.0	...	0.9 (1.6)	0.9 (4.6)	0.9	0.5	0.0	...	0.0
Eq Guinea	##	0.0	0.0 (0.0)	0.0 (0.3)	0.0	...	...	...	0.5 (0.8)	0.5 (3.4)	0.4	0.2	...	...	0.0
Ethiopia	##	0.0	1.8 (0.7)	1.8 (0.9)	1.4	...	0.4	...	10.9 (1.6)	10.9 (4.4)	9.9	8.8	0.0	0.1	0.8
Gambia	##	0.0	0.6 (1.2)	0.6 (4.6)	0.1	...	0.4	0.1	3.4 (1.6)	3.4 (3.9)	3.2	1.2	0.0	0.0	0.1
Ghana	##	0.0	1.1 (0.1)	1.1 (0.3)	0.8	0.0	0.2	0.1	10.0 (0.7)	10.0 (4.9)	9.7	4.1	0.0	0.2	0.1
Guinea	##	0.0	0.3 (0.0)	0.3 (1.0)	0.1	...	0.2	0.0	6.2 (0.9)	6.2 (3.9)	5.9	3.5	0.1	...	0.2
Guinea-Bissau	##	0.0	0.1 (0.6)	0.1 (0.8)	...	...	0.1	0.0	1.2 (1.5)	1.2 (4.2)	1.1	1.0	0.0	...	0.1
Kenya		0.0	5.0 (0.4)	5.0 (0.8)	3.0	0.0	1.9	0.0	9.2 (0.5)	9.2 (4.5)	7.9	4.2	0.0	0.1	1.2
Lesotho	##	0.0	0.9 (1.3)	0.9 (6.4)	0.6	0.0	0.3	...	4.3 (0.7)	4.3 (3.0)	4.2	2.4	0.0	0.0	0.1
Madagascar		0.0	3.7 (1.1)	3.7 (2.3)	3.2	0.0	0.4	0.0	2.7 (0.6)	2.7 (4.2)	2.4	1.9	0.0	0.0	0.3
Malawi		0.0	7.5 (1.7)	7.5 (1.9)	5.3	1.9	0.4	0.0	3.7 (0.5)	3.7 (4.7)	3.5	3.1	0.0	0.0	0.1
Mali		0.0	8.3 (2.3)	8.3 (3.2)	0.3	...	7.7	0.3	5.8 (0.9)	5.8 (4.8)	5.8	2.0	0.0	0.0	0.0
Mauritania	##	0.0	0.0 (0.0)	0.0 (0.0)	...	...	0.0	...	6.9 (3.2)	6.9 (4.8)	6.7	2.8	0.0	0.0	0.2
Mozambique	##	0.0	2.2 (1.4)	2.2 (5.1)	1.4	...	0.7	0.0	10.1 (1.1)	10.1 (4.5)	9.3	7.5	...	0.1	0.7
Niger	##	0.0	0.2 (0.0)	0.2 (0.3)	0.0	0.0	0.1	...	4.4 (0.9)	4.4 (3.7)	4.0	2.1	0.0	0.0	0.3
Rwanda	##	0.0	0.2 (0.2)	0.2 (0.3)	0.1	...	0.1	...	2.0 (0.7)	2.0 (4.4)	1.8	0.9	0.0	0.0	0.2
São Tome Prn	##	0.0	0.0 (0.1)	0.0 (0.4)	0.0	...	0.0	...	0.2 (0.7)	0.2 (3.5)	0.2	0.1	0.0	0.0	0.0
Senegal		0.0	8.6 (1.2)	8.6 (4.7)	2.3	0.0	1.6	4.6	15.7 (1.2)	15.7 (3.6)	14.5	8.5	0.1	0.1	1.0
Sierra Leone	##	0.0	0.1 (0.1)	0.1 (0.5)	0.1	0.0	0.0	0.0	3.7 (2.4)	3.7 (3.7)	3.6	2.7	0.0	0.0	0.1
Somalia	##	0.0	0.0 (0.0)	0.0 (0.0)	...	...	0.0	...	4.4 (1.2)	4.4 (5.0)	4.3	3.6	0.0	...	0.2
Sudan		0.0	15.3 (3.2)	15.3 (3.5)	3.0	...	11.6	0.6	10.4 (1.1)	10.4 (4.0)	9.3	7.2	0.0	0.0	1.0
Tanzania		0.0	6.5 (1.6)	6.5 (2.4)	2.0	0.1	4.3	...	4.1 (0.3)	4.1 (4.1)	3.5	2.3	...	0.0	0.6
Togo		0.0	4.2 (1.5)	4.2 (3.9)	1.1	0.0	2.9	0.2	3.4 (0.6)	3.4 (3.1)	3.2	1.8	0.1	0.0	0.1
Uganda		0.0	1.6 (1.0)	1.6 (1.0)	0.7	0.0	0.9	...	1.0 (0.2)	1.0 (3.9)	0.8	0.2	...	...	0.2
Zaire	##	0.0	0.5 (0.1)	0.5 (0.6)	0.3	...	0.2	0.0	7.8 (1.0)	7.8 (3.9)	7.5	4.9	0.0	0.1	0.1
Zambia	##	0.0	2.0 (0.2)	2.0 (6.3)	1.5	0.0	0.5	0.0	2.9 (0.3)	2.9 (4.2)	2.8	2.6	0.0	0.0	0.1
Middle-Income Countries		0.0	222.6 (0.7)	222.6 (4.5)	192.9	2.7	21.5	5.5	68.3 (0.2)	68.3 (2.6)	62.5	38.6	0.3	3.2	2.3
Botswana		0.0	5.0 (0.2)	5.0 (5.6)	5.0	...	0.0	...	4.2 (0.2)	4.2 (2.9)	4.0	1.2	0.0	0.0	0.1
Cape Verde	##	0.0	... ...	... ...	...	...	...	...	1.5 (1.1)	1.5 (3.1)	1.4	0.6	0.0	0.0	0.1
Côte d'Ivoire		0.0	16.2 (0.6)	16.2 (1.0)	5.7	0.0	6.5	4.0	12.5 (0.6)	12.5 (3.0)	12.2	7.6	0.0	0.1	0.2
Djibouti	##	0.0	... ...	... ...	...	...	...	...	2.4 (1.1)	2.4 (2.6)	2.2	1.1	0.0	0.1	0.1
Liberia	##	0.0	0.1 (0.0)	0.1 (0.2)	0.0	...	0.0	0.1	2.8 (2.2)	2.8 (3.3)	2.7	2.2	0.0	0.0	0.1
Mauritius		0.0	66.2 (5.4)	66.2 (17.2)	66.1	0.0	0.1	0.0	6.0 (0.4)	6.0 (2.9)	5.5	2.3	0.0	0.3	0.2
Namibia		0.0	2.6 (0.2)	2.6 (2.1)	2.6	...	...	...	2.9 (0.2)	2.9 (2.6)	2.7	0.6	...	0.2	...
Seychelles	##	0.0	0.0 (0.0)	0.0 (2.2)	0.0	0.0	0.0	...	0.9 (0.5)	0.9 (2.8)	0.8	0.3	0.0	0.0	0.0
South Africa		0.0	79.2 (0.3)	79.2 (4.8)	68.9	0.1	10.8	1.3	26.3 (0.1)	26.3 (2.2)	22.7	17.4	0.2	2.0	1.4
Swaziland		0.0	31.0 (5.5)	31.0 (9.5)	30.3	0.0	0.8	...	2.6 (0.4)	2.6 (2.6)	2.5	1.0	0.0	0.1	0.0
Zimbabwe		0.0	22.2 (1.4)	22.2 (3.2)	16.2	2.5	3.3	0.1	6.3 (0.3)	6.3 (3.5)	5.9	4.4	0.0	0.3	0.1

Source: Simulated effects of the Uruguay Round agreement on agriculture, assuming the consensus estimates of the changes in world prices and the values of price elasticity and NTB frequency parameters in Table 8.

Notes: Symbols (##) denote countries for which increases in cereal import costs are not matched by equal or greater increases in total export earnings. Values in parentheses are percentage changes in trade.

staple food imports (i.e., cereal imports) for the majority of the LIFD countries and some middle-income countries, as denoted by the double hatch marks (##) in Table 5.

Beyond a short period, the impact effects reported in Table 5 are unsustainable because, particularly for countries whose trade balances are adversely affected, the real exchange rate between traded and nontraded goods must adjust to ensure international balance of payments equilibrium for each country, inclusive of long-term capital flows. Where a trade deficit occurs initially, the real exchange rate--that is, the price of nontraded goods relative to traded goods--must fall (depreciate), and in cases where a trade surplus occurs initially, the real exchange rate must rise (appreciate).

These precepts are observed in the simulation results reported in Table 6. That is, a balance of payments constraint is enforced in the underlying simulation model with the result that the real exchange rate, heretofore held constant, adjusts sufficiently to ensure that the simulated changes in trade, including trade in nonagricultural goods, result in no change in the overall trade balance. Thus, for the six middle-income countries expected to experience initial increases in their net exports of agricultural goods, the real exchange rate appreciates. And, for the middle-income countries as a group, the total increase in imports of all goods rises to US$119 million (0.4 percent), from US$68 million in Table 5, reflecting mainly an improvement in economic welfare.[6]

The circumstances of the low-income countries are less fortunate. In most instances, the real exchange rate falls, and consequently the increase in export earnings of these countries is somewhat higher than before, US$130 million (1.2 percent) compared to US$85 million in Table 5. The total increase in imports of all goods (US$130 million or 0.7 percent), however, is lower than in Table 5 (US$148 million), reflecting the necessity of welfare-reducing adjustments to the volume of each country's imports in order to maintain the balance of payments, or external, equilibrium.

With regard to food import costs, the downward adjustments in exchange rates result in increased export earnings sufficient to finance the higher costs of cereal imports for the majority of the countries identified previously as adversely affected by the Uruguay Round agreement on agriculture. In Table 6, only five low-income countries (Ethiopia, Guinea-Bissau, Lesotho, Mozambique, and Somolia) and two middle-income countries (Cape Verde and Djibouti) are found to be unable to finance their higher costs for cereal imports through increased export earnings. These countries, however, do succeed in financing their higher food costs, by reducing their imports of non-agricultural goods as well as increasing their overall exports in response to the lower level of the real exchange rate. In the case of Ethiopia, for instance, the depreciation of the real exchange rate by 2.5 percent causes the total value of non-agricultural imports to decline by US$2.6 million, which, in combination with the increase in total exports of US$7.9 million, is adequate to cover the increase in the country's cereal import bill of US$8.6 million.

5. EFFECTS WITH TARIFFICATION AND OTHER POLICY REFORMS

Under higher world prices for food commodities after the Uruguay Round agreement, some LIFD countries in Sub-Saharan Africa and other developing regions, and especially the poor or disadvantaged households within these countries, will confront losses in economic welfare. To the extent, however, that the formerly lower prices for grains and other food staples resulted from protection and export subsidy measures in the major industrial countries, higher international prices for agricultural commodities under a more liberal global trading system must be viewed as a desirable outcome for the world as a whole. The challenge to LIFD and other developing countries adversely affected by the higher world prices for food commodities is to minimize the negative effects of the price increases on their domestic economies and poorest households.

Distortions to economic incentives are frequently encountered in the less developed countries. Those adversely affecting agricultural production and exports, in connection with what has been termed the "bias against agriculture," would be alleviated by major reforms to trade and macroeconomic policies (e.g., Bautista and Valdès, 1993). Reforms to related sectoral and regulatory policies would also be beneficial to agricultural productivity and trade. In undertaking improvements to such economic policies, less developed countries in Sub-Saharan Africa and other regions might substantially reduce the possible adverse consequences of the Uruguay Round agreement, and even achieve net economic gains. Indeed, the complementarity between changes in the international trading environment and domestic economic policies is at the core of the question of how developing countries will be affected by the recent GATT agreement. Improvements to the international trading environment are not a viable substitute for prudent macroeconomic and trade policies or for undertaking structural adjustment initiatives, where they may be necessary, in developing countries. This is true for both net importers and net exporters of agricultural goods, as emphasized in the recent work of, among others, Tyers and Anderson (1990; 1993). In this vein, the initial negative impact of the international price increases on net importing countries of food and other farm goods might be turned into positive long-term effects where a high degree of price transmission to domestic farmers occurs and non-price constraints to production are not seriously binding. Similarly, the initial net gains to agricultural-exporting countries may be enhanced under such conditions.

These precepts might be taken into account in the analytical framework here, principally by increasing the degree of price-responsiveness of exports in the simulation model. For instance, increasing the value assumed for the price elasticity of export supply for agricultural goods, from 1.0 to 2.0, results in some sharp reductions in the costs of adjustment, measured in terms of changes in the real exchange rate, to higher world prices for food and other agricultural commodities, especially for the LIFD countries (see Appendix, Table 9).

Another avenue for considering the importance of

Table 6 -- Changes in Trade with Exchange Rate Adjustment

Non-Fuel Exporting African Countries		Real Exchange Rate	Exports: All Goods	Exports: Agricultural Goods: All Agricultural Goods	Exports: Agricultural Goods: Food and Live Animals	Exports: Agricultural Goods: Beverages and Tobacco	Exports: Agricultural Goods: Crude Materials	Exports: Agricultural Goods: Fats and Oils	Imports: All Goods	Imports: Agricultural Goods: All Agricultural Goods	Imports: Agricultural Goods: Food and Live Animals: All	Imports: Agricultural Goods: Food and Live Animals: Cereals	Imports: Agricultural Goods: Beverages and Tobacco	Imports: Agricultural Goods: Crude Materials	Imports: Agricultural Goods: Fats and Oils
		(in percent)	(in millions of U.S. dollars, 1990-92 baseline)												
All Countries		-0.4	248.8 (0.6)	286.0 (3.2)	206.5	-0.0	66.8	12.3	248.8 (0.5)	216.7 (3.5)	201.3	125.8	0.8	4.4	10.4
Low-Income Countries		-0.9	130.0 (1.2)	93.2 (2.2)	38.9	0.2	47.1	7.0	130.0 (0.7)	146.2 (4.1)	137.2	86.7	0.3	0.9	7.9
Benin		0.3	4.5 (1.6)	5.0 (4.8)	0.6	...	4.2	0.2	4.5 (0.7)	4.2 (3.6)	4.1	2.5	0.1	...	0.0
Burkina Faso		0.1	4.7 (1.4)	4.9 (3.5)	-0.0	...	4.9	0.0	4.7 (0.8)	4.5 (4.3)	4.4	3.0	0.0	0.0	0.1
Burundi		-0.7	0.8 (1.0)	0.7 (1.0)	0.6	0.0	0.1	...	0.8 (0.3)	1.1 (4.8)	1.1	0.7	-0.0	0.0	0.0
Cent Afr Rep		-0.4	1.2 (0.9)	0.8 (2.0)	0.1	0.0	0.7	0.0	1.2 (0.8)	1.3 (3.1)	1.2	0.7	0.0	0.0	0.0
Chad		0.8	2.0 (1.0)	2.7 (2.3)	-0.3	...	3.0	0.0	2.0 (0.5)	1.2 (4.9)	1.2	0.6	0.0	...	0.0
Comoros		-2.8	0.6 (3.0)	0.5 (3.1)	0.5	...	0.0	...	0.6 (1.1)	0.9 (4.5)	0.9	0.5	-0.0	...	0.0
Eq Guinea		-1.0	0.4 (1.0)	0.1 (1.2)	0.1	...	...	...	0.4 (0.6)	0.5 (3.3)	0.4	0.2	-0.0	...	0.0
Ethiopia	##	-2.5	7.9 (3.3)	6.7 (3.5)	4.8	0.0	1.9	0.0	7.9 (1.2)	10.5 (4.3)	9.7	8.6	-0.0	0.1	0.7
Gambia		-3.3	2.2 (4.5)	1.0 (7.9)	0.2	...	0.6	0.2	2.2 (1.1)	3.2 (3.7)	3.1	1.1	0.0	0.0	0.1
Ghana		-0.7	7.9 (0.8)	3.5 (1.0)	3.2	0.0	0.2	0.1	7.9 (0.6)	10.0 (4.9)	9.7	4.1	-0.0	0.2	0.1
Guinea		-0.7	5.2 (0.7)	0.4 (1.7)	0.2	...	0.2	0.0	5.2 (0.7)	6.2 (3.8)	5.9	3.4	0.1	...	0.2
Guinea-Bissau	##	-3.6	0.6 (4.2)	0.5 (4.4)	0.4	...	0.2	0.0	0.6 (0.8)	1.1 (3.9)	1.1	0.9	-0.0	...	0.1
Kenya		-0.3	8.0 (0.7)	6.7 (1.0)	4.5	0.1	2.1	0.0	8.0 (0.4)	9.1 (4.5)	7.9	4.2	-0.0	0.1	1.2
Lesotho	##	-1.7	2.0 (3.0)	1.1 (8.1)	0.7	0.0	0.4	...	2.0 (0.3)	4.1 (2.9)	4.0	2.3	-0.0	0.0	0.1
Madagascar		0.2	3.0 (0.9)	3.3 (2.1)	2.9	0.0	0.4	0.0	3.0 (0.6)	2.7 (4.2)	2.4	1.9	0.0	0.0	0.3
Malawi		0.7	4.7 (1.1)	4.9 (1.2)	4.8	-0.2	0.3	0.0	4.7 (0.7)	3.7 (4.7)	3.5	3.2	0.0	0.0	0.1
Mali		0.5	6.5 (1.8)	7.0 (2.7)	-0.1	...	6.9	0.3	6.5 (1.0)	5.9 (4.9)	5.8	2.0	0.0	0.0	0.0
Mauritania		-1.5	6.5 (1.5)	0.8 (1.5)	0.8	...	0.0	...	6.5 (3.0)	6.8 (4.7)	6.6	2.7	0.0	0.0	0.2
Mozambique	##	-2.4	5.8 (3.8)	3.2 (7.4)	2.1	...	1.0	0.1	5.8 (0.7)	9.8 (4.4)	9.1	7.3	-0.0	0.1	0.6
Niger		-0.9	3.4 (1.0)	0.8 (1.2)	0.5	0.1	0.1	...	3.4 (0.7)	4.3 (3.6)	4.0	2.0	0.0	0.0	0.3
Rwanda		-1.2	1.2 (1.4)	1.1 (1.4)	1.0	0.0	0.1	...	1.2 (0.4)	2.0 (4.3)	1.8	0.9	0.0	0.0	0.2
São Tome Prn		-1.0	0.2 (1.1)	0.0 (1.4)	0.0	...	0.0	...	0.2 (0.5)	0.2 (3.4)	0.2	0.1	-0.0	0.0	0.0
Senegal		-0.7	13.8 (1.9)	9.9 (5.4)	2.6	0.0	1.9	5.3	13.8 (1.0)	15.5 (3.6)	14.3	8.5	0.0	0.1	1.0
Sierra Leone		-2.2	3.2 (2.2)	0.5 (2.6)	0.4	0.1	0.0	0.0	3.2 (2.1)	3.5 (3.5)	3.5	2.6	-0.0	0.0	0.1
Somalia	##	-2.8	2.4 (2.9)	1.1 (2.9)	1.0	...	0.1	..	2.4 (0.6)	4.3 (4.8)	4.2	3.5	0.0	...	0.2
Sudan		0.7	11.7 (2.4)	12.1 (2.8)	2.0	...	9.5	0.5	11.7 (1.3)	10.5 (4.0)	9.4	7.3	0.0	0.0	1.1
Tanzania		0.3	5.2 (1.3)	5.6 (2.1)	1.6	0.1	4.0	-0.0	5.2 (0.4)	4.1 (4.1)	3.5	2.3	0.0	0.0	0.6
Togo		0.2	3.6 (1.3)	3.9 (3.7)	1.1	-0.0	2.7	0.1	3.6 (0.8)	3.4 (3.1)	3.2	1.8	0.1	0.0	0.1
Uganda		0.2	1.2 (0.7)	1.3 (0.8)	0.4	0.0	0.8	...	1.2 (0.2)	1.0 (4.0)	0.8	0.2	0.0	...	0.2
Zaire		-0.7	6.7 (0.8)	1.3 (1.3)	0.9	...	0.3	0.0	6.7 (0.9)	7.7 (3.9)	7.4	4.8	-0.0	0.1	0.1
Zambia		-0.1	2.8 (0.2)	2.1 (6.3)	1.5	0.0	0.6	0.0	2.8 (0.3)	2.9 (4.2)	2.8	2.6	0.0	0.0	0.1
Middle-Income Countries		0.1	118.8 (0.4)	192.8 (3.9)	167.6	-0.2	19.7	5.3	118.8 (0.4)	70.4 (2.7)	64.1	39.1	0.4	3.4	2.5
Botswana		0.0	4.5 (0.2)	5.0 (5.6)	5.0	-0.0	0.0	-0.0	4.5 (0.2)	4.2 (2.9)	4.0	1.2	0.0	0.0	0.1
Cape Verde	##	-2.4	0.2 (2.4)	0.0 (2.4)	0.0	0.0	0.0	...	0.2 (0.2)	1.2 (2.6)	1.2	0.5	-0.0	0.0	0.1
Côte d'Ivoire		0.1	13.4 (0.5)	14.7 (0.9)	4.4	0.0	6.3	4.0	13.4 (0.6)	12.6 (3.0)	12.3	7.6	0.0	0.1	0.2
Djibouti	##	-2.2	0.5 (2.2)	0.2 (2.2)	0.2	...	0.0	...	0.5 (0.2)	1.9 (2.1)	1.9	0.9	-0.1	0.0	0.0
Liberia		-1.1	2.3 (1.2)	0.5 (1.3)	0.1	...	0.0	0.1	2.3 (1.9)	2.5 (3.1)	2.5	2.1	-0.0	0.0	0.1
Mauritius		3.1	28.9 (2.4)	54.5 (14.2)	54.5	-0.0	-0.0	0.0	28.9 (1.8)	7.8 (3.7)	6.8	2.7	0.1	0.5	0.4
Namibia		-0.0	2.8 (0.2)	2.8 (2.2)	2.8	...	0.0	...	2.8 (0.2)	2.9 (2.6)	2.7	0.8	...	0.2	...
Seychelles		-0.6	0.3 (0.7)	0.0 (2.9)	0.0	0.0	0.0	...	0.3 (0.2)	0.8 (2.6)	0.8	0.3	-0.0	0.0	0.0
South Africa		0.2	40.2 (0.2)	76.5 (4.6)	64.9	0.0	10.3	1.2	40.2 (0.2)	26.8 (2.2)	23.0	17.5	0.2	2.1	1.4
Swaziland		3.2	13.2 (2.3)	20.7 (6.3)	20.7	-0.2	0.2	...	13.2 (1.8)	3.3 (3.4)	3.1	1.1	0.1	0.1	0.1
Zimbabwe		0.6	12.5 (0.8)	18.0 (2.6)	15.1	-0.0	2.8	0.1	12.5 (0.6)	6.6 (3.6)	6.1	4.5	0.0	0.3	0.2

Source: Simulated effects of the Uruguay Round agreement on agriculture, assuming the consensus estimates of the changes in world prices and the values of price elasticity and NTB frequency parameters in Table 8.

Notes: Real exchange rate changes for country groups are simple averages. Symbols (##) denote countries for which increases in cereal import costs are not matched by equal or greater increases in total export earnings. Values in parentheses are percentage changes in trade.

economic reforms is to incorporate into the quantitative analysis one of the few requirements placed on less developed countries by the Uruguay Round agreement on agriculture, namely, the tariffication of all quotas and other administered restrictions on imports of agricultural goods. As discussed previously, reliance on tariffs as the sole instrument of protection is a major cornerstone of the General Agreement on Tariffs and Trade, because it promotes the central role of prices in market-based economies as well as because it provides a convenient focus for multilateral negotiations to liberalize international trade. In the context of the present study, substituting greater reliance upon prices for administered mechanisms to control agricultural imports should be expected to reduce the magnitude of real exchange rate adjustments in response to the changes in world agricultural prices following the Uruguay Round agreement. In fact, this is an important consideration, given the frequently expressed concerns of policymakers in Sub-Saharan Africa for the costs of adjustment borne by exchange rates in response to many domestic and international developments impinging on the balance of payments of their countries.

The effects on SSA trade of the new GATT agreement, with tariffication, are presented in Table 7. In the simulation model, the tariffication of administered protection measures is represented by a reduction, to zero, of the frequency ratios of nontariff barriers in the sample countries. No other liberalization of import regimes, however, is introduced. That is, the simulation analysis assumes simply that *ad valorem* tariffs replace administered controls on imports, including those related to foreign exchange restrictions, at sufficiently high rates to provide equivalent (but not higher) levels of protection as the initial NTBs.

The simulation results indicate that tariffication implies smaller increases in costs of food and other imports for both the LIFD and middle-income countries in Sub-Saharan Africa. This occurs because tariffication results in sharper declines in agricultural import volumes in response to the higher world prices of temperate zone and tropical commodities, placing less pressure on the real exchange rate to adjust. Thus, the simulated changes in exchange rates are substantially smaller in magnitude than found before. Whereas, the real exchange rates of the low-income countries must fall by 0.9 percent on average with no tariffication (Table 6), they must fall by only 0.2 percent on average with tariffication (Table 7). In the case of the middle-income countries, the real exchange rates are simulated to rise somewhat more on average with tariffication (0.3 percent) than without tariffication (0.1 percent).

Finally, an additional implication of tariffication reflected in the simulation results is that induced changes in export earnings are somewhat lower than found without tariffication. Whereas the total exports of the 42 Sub-Saharan African countries increase by $248 million (0.6 percent) without tariffication, they increase by $193 million (0.4 percent) with tariffication. This occurs because of the greater adjustment of import volumes under tariffication in response to changes in both world prices of commodities and exchange rates. The result is that greater reliance on the price system to ration imports causes the import-competing and export-producing sectors of the domestic economy to bear the costs of adjustment to the new international trading environment for agriculture more equitably.

6. THE WAY AHEAD

The future is likely to witness continuation of many of the political and economic challenges faced by agriculture in the world economy during the last decade. Indeed, economic and other factors are likely to continue to create pressures for further liberalization of agricultural policies in the major industrial countries and the liberalization of a wide range of economic policies impinging on agriculture in the less developed countries of Sub-Saharan Africa and other regions.

The European Union, for example, is likely to face continued pressures for reform of the Common Agricultural Policy emanating from at least two quarters. First, given the limited extent of reforms to agriculture under the Uruguay Round agreement (and notwithstanding the agreement's peace clause), the United States and Cairns Group should be expected to continue to raise disputes with the Western European countries over agricultural support policies. Also in this vein, the fiscal costs of the CAP could begin to climb again as the new compensatory payments system comes into force and farmers demonstrate their ability to generate productivity increases under the new, albeit lower, rates of administered prices and protection from foreign competition. Thus, after the turn of the century a second round of multilateral trade negotiations focusing on agriculture could become a necessity, to preserve and build upon the tentative first steps taken by the Uruguay Round towards thoroughgoing reform of agricultural policies in the global trading system.

Second, the European Union faces the emergence and necessary integration into the world economy of the former Soviet Union and the other newly independent countries of Eastern Europe, possibly as part of the enlargement of the Union itself. In this regard, among the most important challenges to the European Union will be the adoption of further reforms to CAP, to provide the countries of Eastern European with open markets for their eventual surpluses of agricultural commodities that are in their comparative advantage to produce and export competitively (Tyers, 1994; Weyerbrock, 1994).

Continued liberalization of the Common Agricultural Policy and similar farm policies in Japan and the United States should be expected to result in many of the same positive, and some potentially negative, effects on the international trade of the Sub-Saharan African countries highlighted in the main analysis of this paper. Increasing agricultural productivity and food security (the latter through either increased domestic production or greater export earnings) is a challenge that must be faced mainly by the less-developed countries of Sub-Saharan Africa and other regions themselves.

To be sure, expansion of world trade in agriculture and other goods as a result of future multilateral trade negotiations or unilateral reforms to agricultural and other economic policies in the major industrial countries can provide important opportunities for expanding the exports of developing countries. But, notwithstanding increasing protectionism and the current distortions to world trade in agriculture, the dismal export performance of a number of less developed countries in Sub-Saharan Africa and other regions during the last decade can be traced to losses in international competitiveness vis-a-vis other developing countries that

Table 7 -- Changes in Trade with Exchange Rate Adjustment and Tariffication of Trade in Agriculture

Non-Fuel Exporting African Countries		Real Exchange Rate	Exports: All Goods	Exports: Agricultural Goods: All Agricultural Goods	Exports: Agricultural Goods: Food and Live Animals	Exports: Agricultural Goods: Beverages and Tobacco	Exports: Agricultural Goods: Crude Materials	Exports: Agricultural Goods: Fats and Oils	Imports: All Goods	Imports: Agricultural Goods: All Agricultural Goods	Imports: Agricultural Goods: Food and Live Animals: All	Imports: Agricultural Goods: Food and Live Animals: Cereals	Imports: Agricultural Goods: Beverages and Tobacco	Imports: Agricultural Goods: Crude Materials	Imports: Agricultural Goods: Fats and Oils
		(in percent)	(in millions of U.S. dollars, 1990-92 baseline)												
All Countries		0.1	192.8 (0.4)	285.7 (2.9)	194.1	-1.1	61.2	11.4	192.8 (0.4)	137.7 (2.2)	128.8	77.8	0.6	3.0	5.2
Low-Income Countries		-0.2	85.4 (0.8)	75.5 (1.8)	28.2	-0.6	41.7	6.1	85.4 (0.5)	83.7 (2.3)	79.8	49.0	0.1	0.4	3.4
Benin		0.6	3.6 (1.3)	4.6 (4.4)	0.6	...	3.8	0.2	3.6 (0.6)	2.8 (2.4)	2.6	1.6	0.1	...	0.0
Burkina Faso		0.5	3.5 (1.1)	4.4 (3.2)	-0.1	...	4.5	0.0	3.5 (0.6)	2.9 (2.7)	2.8	1.8	0.0	0.0	0.0
Burundi		-0.3	0.5 (0.6)	0.5 (0.6)	0.4	0.0	0.1	...	0.5 (0.2)	0.6 (2.7)	0.6	0.4	-0.0	0.0	0.0
Cent Afr Rep		-0.1	0.7 (0.5)	0.7 (1.7)	0.0	0.0	0.6	0.0	0.7 (0.5)	0.8 (1.8)	0.7	0.4	0.0	0.0	0.0
Chad		1.0	1.7 (0.9)	2.5 (2.2)	-0.3	...	2.8	0.0	1.7 (0.4)	0.8 (3.3)	0.8	0.4	0.0	...	0.0
Comoros		-1.3	0.3 (1.5)	0.2 (1.5)	0.2	...	0.0	...	0.3 (0.5)	0.4 (2.2)	0.4	0.2	-0.0	...	0.0
Eq Guinea		-0.5	0.2 (0.5)	0.0 (0.8)	0.0	...	...	...	0.2 (0.3)	0.3 (1.7)	0.3	0.1	-0.0	...	0.0
Ethiopia	##	-1.0	4.1 (1.7)	3.6 (1.9)	2.7	0.0	0.9	0.0	4.1 (0.6)	5.1 (2.0)	4.9	4.4	-0.0	0.0	0.1
Gambia		-1.2	1.2 (2.4)	0.7 (5.8)	0.1	...	0.5	0.1	1.2 (0.6)	1.5 (1.8)	1.6	0.6	-0.0	-0.0	0.0
Ghana		-0.4	4.6 (0.5)	2.3 (0.7)	2.0	0.0	0.2	0.1	4.6 (0.3)	5.6 (2.7)	5.5	2.3	-0.0	0.1	0.0
Guinea		-0.4	2.9 (0.4)	0.4 (1.3)	0.2	...	0.2	0.0	2.9 (0.4)	3.4 (2.1)	3.3	1.9	-0.0	...	0.1
Guinea-Bissau	##	-1.4	0.3 (2.0)	0.2 (2.2)	0.1	...	0.1	0.0	0.3 (0.4)	0.5 (1.7)	0.5	0.4	-0.0	...	0.0
Kenya		-0.0	5.2 (0.4)	5.1 (0.8)	3.2	0.0	1.9	0.0	5.2 (0.3)	5.3 (2.6)	4.7	2.4	0.0	0.0	0.5
Lesotho		-0.6	1.3 (1.9)	0.9 (7.0)	0.6	0.0	0.3	...	1.3 (0.2)	2.1 (1.4)	2.1	1.2	-0.0	0.0	0.0
Madagascar		0.5	2.2 (0.7)	3.0 (1.9)	2.6	-0.0	0.4	-0.0	2.2 (0.4)	1.7 (2.6)	1.5	1.2	0.0	0.0	0.2
Malawi		0.9	3.8 (0.9)	4.0 (1.0)	4.6	-0.8	0.3	0.0	3.8 (0.5)	2.4 (3.1)	2.3	2.0	0.0	0.0	0.1
Mali		0.9	5.2 (1.4)	6.0 (2.3)	-0.5	...	6.2	0.2	5.2 (0.8)	4.0 (3.3)	3.9	1.3	0.1	0.0	0.0
Mauritania		-0.8	3.5 (0.8)	0.3 (0.8)	0.3	...	0.0	...	3.5 (1.6)	3.6 (2.5)	3.6	1.4	-0.0	0.0	0.0
Mozambique	##	-0.8	3.5 (2.2)	2.5 (5.9)	1.6	...	0.8	0.1	3.5 (0.4)	4.9 (2.2)	4.7	3.8	-0.0	0.0	0.1
Niger		-0.5	1.9 (0.5)	0.5 (0.8)	0.3	0.0	0.1	...	1.9 (0.4)	2.3 (1.9)	2.2	1.1	-0.0	0.0	0.1
Rwanda		-0.6	0.7 (0.8)	0.6 (0.8)	0.6	0.0	0.1	...	0.7 (0.2)	1.0 (2.3)	1.0	0.5	-0.0	0.0	0.1
São Tome Prn		-0.5	0.1 (0.6)	0.0 (0.9)	0.0	...	0.0	...	0.1 (0.3)	0.1 (1.8)	0.1	0.1	-0.0	0.0	0.0
Senegal		-0.1	9.0 (1.2)	8.7 (4.8)	2.3	0.0	1.6	4.7	9.0 (0.7)	9.1 (2.1)	8.5	4.9	0.0	0.1	0.4
Sierra Leone		-1.0	1.5 (1.0)	0.3 (1.5)	0.2	0.0	0.0	0.0	1.5 (1.0)	1.7 (1.7)	1.7	1.3	-0.0	-0.0	0.0
Somalia	##	-1.3	1.1 (1.3)	0.5 (1.4)	0.5	...	0.1	...	1.1 (0.3)	2.0 (2.3)	2.0	1.7	-0.0	...	0.0
Sudan		1.2	9.4 (2.0)	10.0 (2.3)	1.4	...	8.2	0.5	9.4 (1.0)	7.4 (2.9)	6.6	4.9	0.0	0.0	0.8
Tanzania		0.5	4.4 (1.1)	5.1 (1.9)	1.3	0.0	3.8	-0.0	4.4 (0.3)	2.6 (2.6)	2.2	1.4	0.0	0.0	0.4
Togo		0.5	2.8 (1.0)	3.6 (3.4)	0.9	-0.0	2.6	0.1	2.8 (0.5)	2.2 (2.1)	2.1	1.1	0.1	0.0	0.1
Uganda		0.3	1.0 (0.6)	1.1 (0.7)	0.3	0.0	0.8	...	1.0 (0.2)	0.6 (2.5)	0.5	0.1	0.0	...	0.1
Zaire		-0.4	3.7 (0.4)	0.9 (0.9)	0.6	...	0.3	0.0	3.7 (0.5)	4.2 (2.1)	4.1	2.7	-0.0	0.1	0.0
Zambia		0.0	1.7 (0.1)	2.0 (6.2)	1.4	0.0	0.5	0.0	1.7 (0.2)	1.7 (2.4)	1.6	1.5	0.0	0.0	0.0
Middle-Income Countries		0.3	107.3 (0.3)	190.3 (3.9)	165.9	-0.5	19.4	5.3	107.3 (0.4)	53.9 (2.1)	48.9	28.8	0.6	2.6	1.8
Botswana		0.1	3.7 (0.2)	5.0 (5.5)	5.0	-0.0	0.0	-0.0	3.7 (0.2)	3.1 (2.1)	3.0	0.8	0.0	0.0	0.1
Cape Verde	##	-1.4	0.1 (1.4)	0.0 (1.4)	0.0	0.0	0.0	...	0.1 (0.1)	0.8 (1.6)	0.8	0.3	-0.0	0.0	0.0
Côte d'Ivoire		0.2	10.9 (0.4)	13.3 (0.8)	3.3	0.0	6.2	3.9	10.9 (0.5)	9.4 (2.3)	9.1	5.5	0.0	0.1	0.1
Djibouti	##	-1.3	0.3 (1.3)	0.1 (1.3)	0.1	...	0.0	...	0.3 (0.1)	1.1 (1.2)	1.2	0.6	-0.1	-0.1	0.0
Liberia		-0.7	1.5 (0.8)	0.4 (0.9)	0.0	...	0.0	0.1	1.5 (1.2)	1.7 (2.0)	1.7	1.4	-0.0	0.0	0.0
Mauritius		3.1	28.8 (2.4)	54.4 (14.1)	54.5	-0.0	-0.0	0.0	28.8 (1.8)	7.4 (3.6)	6.2	2.4	0.1	0.6	0.4
Namibia		0.0	2.3 (0.2)	2.6 (2.1)	2.6	...	-0.0	...	2.3 (0.2)	2.1 (1.9)	2.0	0.4	...	0.1	...
Seychelles		-0.4	0.2 (0.5)	0.0 (2.7)	0.0	0.0	0.0	...	0.2 (0.1)	0.5 (1.8)	0.5	0.2	-0.0	0.0	0.0
South Africa		0.2	34.7 (0.1)	76.1 (4.8)	64.7	-0.0	10.2	1.2	34.7 (0.2)	19.4 (1.6)	16.7	12.7	0.3	1.4	0.9
Swaziland		3.1	13.2 (2.3)	20.7 (6.3)	20.7	-0.2	0.2	...	13.2 (1.8)	3.4 (3.5)	3.0	1.0	0.2	0.1	0.1
Zimbabwe		0.7	11.5 (0.7)	17.6 (2.5)	15.0	-0.3	2.8	0.1	11.5 (0.5)	5.1 (2.8)	4.6	3.4	0.0	0.3	0.2

Source: Simulated effects of the Uruguay Round agreement on agriculture, assuming the consensus estimates of the changes in world prices and the values of price elasticity and NTB frequency parameters in Table 8.

Notes: Real exchange rate changes for country groups are simple averages. Symbols (##) denote countries for which increases in cereal import costs are not matched by equal or greater increases in total export earnings. Values in parentheses are percentage changes in trade.

have adopted more liberal trade regimes.[7] Thus, the benefits of global trade liberalization to low-income countries in Sub-Saharan Africa with weak export performance related to competitiveness problems are likely to be inferior to the benefits that these countries would enjoy from initiating, and maintaining, reforms to Table 7 their own macroeconomic and trade policies. Indeed, extensive controls on both exports and imports, to control international payments imbalances but also to promote industrialization and diversify exports beyond the limits of comparative advantage, have restrained agricultural productivity and proper maintenance of rural infrastructure to such an extent in a number of African countries that improvements in the international agricultural trading environment occasioned by the Uruguay Round or future developments may lie beyond the ability of these countries to capitalize upon in the near-term.[8]

Thus, in Sub-Saharan Africa and many other parts of the Third World the fundamental challenge remains that identified during the 1980s, namely, to reduce the bias against agriculture and, in so doing, to realize the potential of the agriculture sector for contributing significantly to domestic economic growth (Bautista and Valdès, 1993). Success in this endeavor is to be found preeminently in adopting economic policies that result in "openness" of the domestic economy to foreign trade and investment. The mainly liberal trade regimes of the major industrial countries and a growing number of developing countries in East and Southeast Asia provide worthy examples. So, too, do tariffication and the other basic principles of a liberal global trading system embodied in the General Agreement on Tariffs and Trade and the new World Trade Organization. Notwithstanding the clear lessons that derive from these examples, difficult obstacles in the political economy of reforming economic policies in Sub-Saharan African and other developing countries must also be recognized, especially those posed by the intransigence of vested parastatal and private interests in import-substitution and industrialization policies. In this last regard, the political obstacles to policy reforms are not entirely unlike those surrounding agriculture and agricultural policies in the European Union, Japan, and the United States.

In the final analysis, the complementarity of resources in the major industrial countries and the Third World should be looked to, and used more extensively as a guide for economic policymaking in both blocs of countries. In particular, the potential for large economic gains from policy reforms by both blocs, on an either unilateral or multilateral basis, should be more widely recognized, and it is to achieving such gains that policymakers in Western Europe, Africa and other regions of both the First World and the Third World should pledge themselves during the next decade. While this objective cannot, of course, be pursued outside the bounds of domestic political systems, it can be pursued through seeking broader and better understanding by different domestic interest groups of the overarching benefits of greater economic integration in the world economy.

NOTES:

1. The introduction is based on a number of studies of the global implications of the agricultural policies of the European Union and other major industrial countries, including Valdès and Zietz (1980), Koester and Bale (1984), Matthews (1985), Noguès (1985), Petit (1985), Hathaway (1987), Goldin and Knudsen (1990), and Tyers and Anderson (1992).

2. On AMS and similar empirical measures of distortions to international trade attributable to domestic agricultural programs, see Josling (1973; 1975) and de Gorter and Harvey (1990).

3. A fourth element of the negotiations focused on trade-distorting sanitary and phytosanitary measures. Alleged abuses in the application of such measures have been the subject of concerns expressed by agricultural trade officials in industrial and developing countries for many years. For further discussion, see, for instance, Josling et al. (1994) and Sanderson (1994).

4. During 1990-92, the non-fuel exporting countries of Sub-Saharan Africa were extended food aid in the amount of over 3.3 million metric tons of cereals and coarse grains per annum, with about two-thirds of this aid (2.1 million tons) going to lower-income countries in the region.

5. The consensus estimates of the international price effects of the Uruguay Round agreement on agriculture, along with the values of the trade price-elasticity and NTB-protection parameters assumed for the African countries in the analytical model, are summarized in Table 8 of the Appendix.

6. The total increase in exports for the middle-income countries in Table 6 (US$119 million or 0.4 percent) is smaller than in Table 5 (US$223 million) because of the number of higher-income countries whose real exchange rate must appreciate.

7. In the context of groundnut exporters in West Africa, see Badiane and Kinteh (1994).

8. On the importance of infrastructure and other non-price constraints to agricultural output in Africa, see, for instance, Mellor, Delgado, and Blackie (1987).

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APPENDIX: THE EMPIRICAL MODEL

The quantitative trade model underlying the simulation results presented in the paper is a simple multi-sector version of the Dornbusch model of international trade incorporating the nontraded goods sector (Dornbusch, 1974). The model has been applied previously to investigate the relationship between protection and export performance in Sub-Saharan African countries (DeRosa, 1992) and is briefly described here.

The model is comprised of equations depicting equilibrium in markets for three types of goods: exportables, importables, and nontraded goods. For each African country, the requirement for "balanced trade" is enforced by the international balance of payments condition:

$$\Sigma_i[PX_i(X_i-P_i^*M_i)] + K^* = 0, \qquad (1)$$

where X_i (M_i) is exports (imports) of traded goods in category i; P_i^* denotes the international terms of trade (PM_i/PX_i), which are assumed exogenously determined; PX_i and PM_i are the domestic prices of exportables and importables relative to nontraded goods (the numeraire); and K^* is an exogenously determined flow of international resources available to finance trade imbalances.

To make the model more tractable for applied analysis, export supply and import demand are assumed single-valued functions of PX_i and PM_i, respectively. As emphasized by Dornbusch (1974), this popular simplification of the model assumes that exportables and importables are both substitutes for nontraded goods and that demands for traded goods are neither substitutes nor complements for one another. In addition, changes in real incomes are assumed to influence only demands for nontraded goods. Finally, the real exchange rate, R, is the inverse of the relative price of any exportable, PX_i.

Domestic prices of imported goods are related to the international terms of trade, the real exchange rate, and tariff and nontariff protection measures by the ad hoc relationship:

$$PM_i = \{PMT_i \exp(1-f_i)\}\ \{PMN_i \exp(f_i)\}, \qquad (2)$$

where

$$PMT_i = P_i^*(1+t_i)/R, \qquad (2a)$$
$$PMN_i = B_i/\eta_i, \qquad (2b)$$

and where PMT_i and PMN_i are the landed prices of imports M_i covered by tariffs and nontariff barriers (NTBs) respectively, ti is the ad valorem tariff rate on imports M_i, B_i is the quantitative limit on imports M_i that policymakers enforce through administered control measures with frequency f_i, η_i is the own-price elasticity of demand for imports M_i, and the exp-operator denotes variables raised to an exponential power (for example, A exp(Z) means A raised to the exponential power Z). Equation (2) states that the domestic price of imports M_i is an index composed of the landed price of imports M_i affected solely by import tariffs (first term in brackets) and the landed price of imports M_i affected by nontariff barriers (second term in brackets).

The foregoing relationships are combined in the multi-sector model to derive the adjustment of the real exchange rate R satisfying the balance of payments condition in equation (1), for the changes in the international terms of trade of agricultural commodities, P_i^*, resulting from the outcome of the Uruguay Round. In the applied version of the model, the changes in P_i^* are represented by exogenously determined changes in U.S. dollar prices of internationally-traded agricultural commodities. Employing the e-operator to denote proportional changes in variables (that is, eZ means dZ/Z), the proportional change in R is found by the equation:

$$eR = \Sigma_i\{[VX_i(1+\alpha_i)-VM_i(1-f_i)(1+\eta_i)]eP_i^*\} / D, \qquad (3)$$

where

$$D = \{\Sigma_i[VX_i\alpha_i-VM_i(1-f_i)\eta_i]\},$$

and where VX_i and VM_i are the initial values (in terms of U.S. dollars) of exports X_i and imports M_i respectively, and α_i is the own-price elasticity of export supply in category i. Substitution of the real exchange rate change, eR, and the Uruguay Round-induced changes in international terms of trade, eP_i^*, into the model's relationships for export supply and import demand in each category i yields solutions for the other variables reported in the tables of simulation results in the paper. Finally, the simulation results assuming the tariffication of nontariff barriers in African countries are derived by first setting the NTB frequency parameters, f_i, in equation (3) equal to zero.

The baseline values of exports and imports utilized in the empirical model are values of trade (disaggregated by Standard International Trade Classification divisions) underlying the international trade statistics for African countries reported in Table 4. The changes in world prices of farm commodities resulting from the Uruguay Round agreement on agriculture are the consensus estimates derived from global economic models reported in Table 8. Also reported in Table 8 are the values assumed for the empirical model's price elasticity and NTB frequency parameters.

Table 8: Simulation assumptions and parameter values

Traded Goods (SITC Division)	Change in world price (percent)	Sub-Saharan African Countries			
		Own-price elasticity		NTB frequency[1]	
		Import demand	Export supply	Low-income countries	Middle-income countries
Food and live Animals (0)					
Meats (01)	3.00	-0.42	1.00	0.90	0.50
Dairy (02)	8.40	-0.40	1.00	0.90	0.50
Cereals (04)	5.70	-0.45	1.00	0.90	0.50
Sugar (06)	9.00	-0.40	1.00	0.90	0.50
Coffee, cocoa, tea spices (07)	0.10	-0.40	1.00	0.90	0.50
Coarse Grains (08)	2.10	-0.73	1.00	0.90	0.50
Beverages and Tobacco (1)					
Tobacco (12)	0.30	-0.40	1.00	0.90	0.50
Crude Materials (2)					
Oilseeds (22)	3.00	-0.50	1.00	0.90	0.50
Textile Fibres (26)	2.30	-0.58	1.00	0.75	0.50
Crude materials (29)	1.00	-0.58	1.00	0.75	0.50
Fats and Oils (4)					
Fixed vegetable oils (42)	2.40	-0.58	1.00	0.90	0.50
Other agricultural goods (0 through 2, 4)	0.00[3]	-0.58	1.00	0.75[4]	0.50
Non-agricultural goods (3, 5 through 8)	0.00	-1.00	1.00	0.75	0.50

Sources: Page *et al.* (1991); DeRosa (1992); and FAO (1994).

[1] Proportion of national tariff schedule lines affected by non-tariff barrieres within the traded good category.

[2] Consensus estimates of the effects of the Uruguay Round Agreement on agriculture on world prices of agricultural prices, derived as simple averages of FAO-compiled estimates from global economic models.

[3] No price change estimates.

[4] Divisions of SITC 1 and SITC 4 equal 0.90.

Table 9 -- Changes in Trade with Exchange Rate Adjustment (Supply Elasticities for Agricultural Exports Equal to 2.0)

Non-Fuel Exporting African Countries		Real Exchange Rate	Exports: All Goods	Exports: Agricultural Goods: All Agricultural Goods	Exports: Agricultural Goods: Food and Live Animals	Exports: Agricultural Goods: Beverages and Tobacco	Exports: Agricultural Goods: Crude Materials	Exports: Agricultural Goods: Fats and Oils	Imports: All Goods	Imports: Agricultural Goods: All Agricultural Goods	Imports: Agricultural Goods: Food and Live Animals: All	Imports: Agricultural Goods: Food and Live Animals: Cereals	Imports: Agricultural Goods: Beverages and Tobacco	Imports: Agricultural Goods: Crude Materials	Imports: Agricultural Goods: Fats and Oils
		(in percent)	(in millions of U.S. dollars, 1990-92 baseline)												
All Countries		-0.1	282.8 (0.6)	372.2 (4.1)	272.0	-5.3	87.8	17.2	282.8 (0.6)	218.7 (3.5)	202.8	126.5	0.8	4.5	10.6
Low-Income Countries		-0.5	141.8 (1.3)	118.4 (2.9)	49.6	-1.6	60.8	9.6	141.8 (0.8)	147.1 (4.1)	137.8	87.0	0.3	1.0	8.0
Benin		0.7	5.1 (1.9)	6.4 (6.1)	0.9	...	5.3	0.2	5.1 (0.8)	4.2 (3.6)	4.1	2.5	0.1	...	0.0
Burkina Faso		0.5	5.2 (1.6)	6.2 (4.4)	-0.2	...	6.4	0.0	5.2 (0.9)	4.6 (4.3)	4.5	3.0	0.0	0.0	0.1
Burundi		-0.4	0.9 (1.2)	0.9 (1.2)	0.8	0.0	0.1	...	0.9 (0.4)	1.2 (4.8)	1.1	0.7	-0.0	0.0	0.0
Cent Afr Rep		-0.2	1.2 (0.9)	1.1 (2.8)	0.1	0.0	1.0	0.0	1.2 (0.8)	1.3 (3.1)	1.2	0.7	0.0	0.0	0.0
Chad		1.0	2.2 (1.1)	3.1 (2.6)	-0.7	...	3.8	0.0	2.2 (0.5)	1.2 (4.9)	1.2	0.6	0.0	...	0.0
Comoros		-1.9	0.7 (3.5)	0.6 (4.1)	0.6	...	0.0	...	0.7 (1.3)	0.9 (4.5)	0.9	0.5	-0.0	...	0.0
Eq Guinea		-0.9	0.4 (1.0)	0.1 (2.2)	0.1	...	...	...	0.4 (0.8)	0.5 (3.3)	0.4	0.2	-0.0	...	0.0
Ethiopia		-1.5	9.1 (3.8)	8.4 (4.4)	6.1	0.0	2.3	0.0	9.1 (1.4)	10.6 (4.3)	9.8	8.7	-0.0	0.1	0.8
Gambia		-2.6	2.4 (5.0)	1.5 (12.1)	0.2	...	1.0	0.3	2.4 (1.2)	3.2 (3.8)	3.1	1.2	0.0	0.0	0.1
Ghana		-0.5	8.5 (0.9)	5.2 (1.5)	4.8	0.0	0.3	0.2	8.5 (0.6)	10.0 (4.9)	9.7	4.1	0.0	0.2	0.1
Guinea		-0.7	5.2 (0.8)	0.7 (2.8)	0.4	...	0.3	0.0	5.2 (0.7)	6.2 (3.8)	5.9	3.4	0.1	...	0.2
Guinea-Bissau	##	-2.6	0.8 (5.3)	0.7 (6.3)	0.5	...	0.2	0.0	0.8 (1.0)	1.2 (4.0)	1.1	0.9	-0.0	...	0.1
Kenya		-0.1	8.8 (0.8)	8.4 (1.3)	5.4	0.1	2.9	0.0	8.8 (0.5)	9.2 (4.5)	7.9	4.2	0.0	0.1	1.2
Lesotho		-1.4	2.4 (3.7)	1.7 (12.4)	1.0	0.0	0.6	...	2.4 (0.4)	4.2 (2.9)	4.1	2.3	-0.0	0.0	0.1
Madagascar		0.5	3.3 (1.0)	4.0 (2.5)	3.5	-0.0	0.5	-0.0	3.3 (0.7)	2.8 (4.2)	2.5	1.9	0.0	0.0	0.3
Malawi		0.8	4.9 (1.1)	5.1 (1.3)	6.7	-2.0	0.4	0.0	4.9 (0.7)	3.7 (4.7)	3.5	3.2	0.0	0.0	0.1
Mali		0.9	7.1 (2.0)	7.9 (3.0)	-1.1	...	8.6	0.3	7.1 (1.1)	5.9 (4.9)	5.8	2.0	0.0	0.0	0.0
Mauritania		-1.3	6.6 (1.5)	1.2 (2.7)	1.1	...	0.0	...	6.6 (3.0)	6.8 (4.7)	6.6	2.7	0.0	0.0	0.2
Mozambique	##	-1.8	6.8 (4.4)	4.8 (11.2)	3.1	...	1.6	0.1	6.8 (0.8)	9.8 (4.4)	9.1	7.4	-0.0	0.1	0.6
Niger		-0.8	3.6 (1.0)	1.3 (2.0)	0.9	0.1	0.2	...	3.6 (0.7)	4.3 (3.6)	4.0	2.0	0.0	0.0	0.3
Rwanda		-0.7	1.5 (1.7)	1.5 (1.8)	1.3	0.0	0.2	...	1.5 (0.5)	2.0 (4.3)	1.8	0.9	0.0	0.0	0.2
São Tome Prn		-0.8	0.2 (1.1)	0.1 (2.3)	0.1	...	0.0	...	0.2 (0.5)	0.2 (3.4)	0.2	0.1	-0.0	0.0	0.0
Senegal		-0.2	15.1 (2.1)	13.7 (7.5)	3.7	0.0	2.6	7.4	15.1 (1.1)	15.6 (3.6)	14.4	8.5	0.1	0.1	1.0
Sierra Leone		-1.9	3.3 (2.2)	0.8 (4.5)	0.7	0.1	0.0	0.0	3.3 (2.1)	3.8 (3.5)	3.5	2.7	-0.0	0.0	0.1
Somalia	##	-2.3	2.8 (3.4)	1.7 (4.6)	1.6	...	0.2	...	2.8 (0.8)	4.3 (4.8)	4.2	3.5	0.0	...	0.2
Sudan		1.1	12.4 (2.6)	13.0 (3.0)	1.4	...	10.9	0.6	12.4 (1.4)	10.6 (4.0)	9.4	7.3	0.0	0.0	1.1
Tanzania		0.6	6.0 (1.5)	6.8 (2.6)	1.4	-0.0	5.4	-0.0	6.0 (0.4)	4.1 (4.2)	3.5	2.3	0.0	0.0	0.6
Togo		0.6	4.1 (1.5)	5.0 (4.7)	1.3	-0.0	3.6	0.2	4.1 (0.7)	3.4 (3.1)	3.2	1.8	0.1	0.0	0.1
Uganda		0.3	1.4 (0.8)	1.4 (0.9)	0.2	0.0	1.2	...	1.4 (0.3)	1.0 (4.0)	0.8	0.2	0.0	...	0.2
Zaire		-0.6	6.8 (0.8)	2.1 (2.1)	1.5	...	0.5	0.1	6.8 (0.9)	7.7 (3.9)	7.5	4.8	-0.0	0.1	0.1
Zambia		0.0	2.9 (0.2)	3.0 (9.4)	2.2	0.0	0.8	0.0	2.9 (0.3)	2.9 (4.2)	2.8	2.6	0.0	0.0	0.1
Middle-Income Countries		0.3	141.0 (0.4)	253.7 (5.1)	222.4	-3.7	27.0	7.6	141.0 (0.5)	71.7 (2.7)	65.0	39.5	0.5	3.6	2.6
Botswana		0.1	5.3 (0.2)	7.4 (8.2)	7.3	-0.0	0.0	-0.0	5.3 (0.2)	4.2 (2.9)	4.1	1.2	0.0	0.0	0.1
Cape Verde	##	-2.3	0.2 (2.8)	0.1 (4.6)	0.1	0.0	0.0	...	0.2 (0.2)	1.3 (2.6)	1.2	0.5	-0.0	0.0	0.1
Côte d'Ivoire		0.2	14.5 (0.5)	17.4 (1.1)	2.9	0.0	9.1	5.7	14.5 (0.7)	12.7 (3.1)	12.4	7.7	0.0	0.1	0.2
Djibouti	##	-2.1	0.6 (2.9)	0.3 (4.1)	0.3	...	0.0	...	0.6 (0.3)	1.9 (2.1)	1.9	1.0	-0.0	0.0	0.1
Liberia		-0.9	2.4 (1.2)	0.9 (2.2)	0.1	...	0.0	0.1	2.4 (1.9)	2.6 (3.1)	2.5	2.1	-0.0	0.0	0.1
Mauritius		4.0	35.7 (2.9)	68.8 (17.9)	69.1	-0.1	-0.2	-0.0	35.7 (2.2)	8.0 (3.9)	6.9	2.8	0.1	0.6	0.4
Namibia		0.1	3.2 (0.3)	3.8 (3.1)	3.8	...	-0.0	...	3.2 (0.3)	2.9 (2.8)	2.7	0.6	...	0.2	...
Seychelles		-0.6	0.3 (0.7)	0.0 (4.6)	0.0	0.0	0.0	...	0.3 (0.2)	0.8 (2.6)	0.8	0.3	-0.0	0.0	0.0
South Africa		0.3	49.5 (0.2)	109.8 (6.7)	93.8	-0.2	14.5	1.8	49.5 (0.3)	27.1 (2.3)	23.2	17.6	0.3	2.1	1.5
Swaziland		3.6	14.6 (2.6)	23.2 (7.1)	23.6	-0.4	-0.1	...	14.6 (2.0)	3.4 (3.5)	3.2	1.2	0.1	0.1	0.1
Zimbabwe		0.8	14.6 (0.9)	22.0 (3.2)	21.3	-3.0	3.6	0.1	14.6 (0.7)	6.7 (3.7)	6.1	4.5	0.0	0.3	0.2

Source: Simulated effects of the Uruguay Round agreement on agriculture, assuming the consensus estimates of the changes in world prices and the values of price elasticity and NTB frequency parameters in Table 8.

Notes: Real exchange rate changes for country groups are simple averages. Symbols (##) denote countries for which increases in cereal import costs are not matched by equal or greater increases in total export earnings. Values in parentheses are percentage changes in trade.