The Road Ahead: Agricultural Policy Reform in the WTO—Summary Report. Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 797.

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Abstract

Agricultural trade barriers and producer subsidies inflict real costs, both on the countries that use these policies and on their trade partners. Trade barriers lower demand for trade partners' products, domestic subsidies can induce an oversupply of agricultural products which depresses world prices, and export subsidies create increased competition for producers in other countries. Eliminating global agricultural policy distortions would result in an annual world welfare gain of $56 billion. High protection for agricultural commodities in the form of tariffs continues to be the major factor restricting world trade. In 2000, World Trade Organization (WTO) members continued global negotiations on agricultural policy reform. To help policymakers and others realize what is at stake in the global agricultural negotiations, this report quantifies the costs of global agricultural distortions and the potential benefits of their full elimination. It also analyzes the effects on U.S. and world agriculture if only partial reform is achieved in liberalizing tariffs, tariff-rate quotas (limits on imported goods), domestic support, and export subsidies.

Acknowledgments

Appreciation is extended to Mary Bohman, Praveen Dixit, Elizabeth Jones, Linwood Hoffman, and Mary Anne Normile for their roles in the oversight and review of this project's development, and to Aziz Elbehri for his valuable contributions as an economics editor. We wish to thank Roger Betancourt and Sherman Robinson for major conceptual contributions. Gene Hasha, Roy Hawkins, Wilma Davis, and Faith Carter provided technical support. Thanks also to John Weber and Mary Reardon, our technical editors, and Susan DeGeorge, Cynthia Ray, and Wynnice Napper our graphics staff. The authors gratefully acknowledge the reviews of Phillip Abbot, David Blandford, Eugenio Diaz-Bonilla, Carol Goodloe, Harry de Gorter, Jason Hafemeister, Debra Henke, Thomas Hertel, Cathy Jabara, Timothy Josling, Suchada Langley, Cathy McKinnell, Karl Meilke, Steven Neff, Karl Rich, Sharon Sheffield, Ian Sheldon, Wyatt Thompson, Stephen Vogel, and Linda Young.

Washington, DC 20036-5831 January 2001

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Summary

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Key findings include:

Global agricultural policy distortions impose substantial, long-term costs on the world economy; in the long term, the full elimination of these policy distortions would result in an annual world welfare gain of $56 billion, about 0.2 percent of global GDP. These projected welfare gains, or increased purchasing power, can be decomposed into the removal of distortions in production and consumption ($31 billion), the effects of policy reform on global savings and investment ($5 billion), and increased productivity gains, mainly in emerging and developing countries ($20 billion). Total, long-term welfare benefits to the United States from eliminating world agricultural policy distortions are $13.3 billion annually — about 24 percent of global gains. U.S. gains would mainly come from our trade partners' policy reforms.

Elimination of agricultural trade and domestic policy distortions could raise world agricultural prices about 12 percent. Import tariffs lower food demand, and domestic support and export subsidies encourage excess supply — all result in lower world agricultural prices. European Union (EU) agricultural policies account for 38 percent, and Japanese plus Korean policies combined account for 12 percent, of global price distortions. U.S. agricultural policies account for about 16 percent of global price distortions.

Tariffs and tariff-rate quotas account for more market distortions than domestic subsidies and export subsidies. Tariffs and tariff-rate quotas account for most of the agricultural price distortions (52 percent) from agricultural protection and support. Post-Uruguay Round agricultural tariffs remain high, with a global average rate of 62 percent, and an industrial country average of 45 percent. Domestic subsidies (31 percent) and export subsidies (13 percent) have comparatively smaller, direct roles in reducing world prices. The remaining 4 percent measures the interaction effects of the three policies combined.

Continuing the Uruguay Round reductions (an additional 20 percent) in the Aggregate Measurement of Support (AMS) will have less of an impact than leveling domestic support across countries and commodities, an alternative, generic approach to reducing domestic support. An additional 20-percent reduction in the Uruguay Round ceilings on total support expenditure would affect a small number of OECD countries, because many countries' expenditures are already below their AMS limits, based on 1998 policies. Leveling and reducing domestic support on a commodity basis would engage more countries and commodities in the reform process. Commodity impacts would also differ under the two approaches.

Despite their relatively small aggregate price effects, export subsidies play an important role in the reform process. Tariffs and domestic support policies of many countries contribute to distorted global markets. The global effects of export subsidies, however, are mostly attributable to a single region, the EU. Export subsidies significantly affect trade in some markets, create increased competition that strains trade relationships, and are an integral part of related domestic price support programs.

Many trade and domestic policies operate interdependently, and options for reform of some policies are linked. A reduction in tariffs would reduce the problems related to TRQ's by reducing over-quota tariffs. Trade policy reforms can help achieve reforms of domestic market price support, because price support programs generally rely on tariffs and export subsidies to be effective. Greater constraints on export subsidies can help some countries ease their reluctance to reduce their import barriers because of unfairly subsidized competition, and can create pressures for reducing related domestic price support that encourages surplus production.

Emerging and developing countries can benefit from further policy reforms. These countries have diverse, and sometimes divergent, interests in the negotiations. Global policy reform will lead to increased agricultural exports by many emerging and developing countries and improved terms of trade. Most of the potential benefits from policy reform will come from developing countries' reform of their own policies. Their full engagement in a global reform process could increase their welfare by $21 billion annually. Low-income developing countries' food aid needs will decline 6 percent as their domestic food production expands in response to higher world prices.

Glossary

Agreement on Agriculture. Part of the Uruguay Round agreement covering issues related to agriculture (e.g., market access, export subsidies, and internal support).

AMS (Aggregate Measurement of Support). An index that measures the monetary value of the extent of government support to a sector. The AMS, as defined in the Agreement on Agriculture, includes both budgetary outlays as well as revenue transfers from consumers to producers as a result of policies that distort market prices. The AMS includes actual or calculated amounts of direct payments to producers (such as deficiency payments), input subsidies (on irrigation water, for example), the estimated value of revenue transferred from consumers to producers as a result of policies that distort market prices (market price supports), and interest subsidies on commodity loan programs. The AMS differs from the broader agricultural support measure, the Producer Subsidy Equivalent, by excluding estimated benefits (or costs) of certain noncommodity specific policies (e.g., research and environmental programs), and by using special WTO-defined measures of deficiency payments and market price supports. Furthermore, the final AMS for the WTO implementation period (1995-2000) is adjusted to exclude deficiency payments under WTO special provisions, even though they are included in the WTO base period.

Bound tariff rates. Tariff rates resulting from GATT negotiations or accessions that are incorporated as part of a country's schedule of concessions. Bound rates are enforceable under Article II of GATT. If a GATT contracting party raises a tariff above the bound rate, the affected countries have the right to retaliate against an equivalent value of the offending country's exports or receive compensation, usually in the form of reduced tariffs of other products they export to the offending country.

Cairns group. A group formed in 1986 in Cairns, Australia, that seeks the removal of trade barriers and substantial reductions in subsidies affecting agricultural trade. The group includes Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Fiji, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, the Philippines, Thailand, South Africa, and Uruguay. The Cairns Group was a strong coalition in the Uruguay Round of multilateral trade negotiations.

Ceiling binding. In cases where an existing tariff was not already bound, developing countries were allowed to establish ceiling bindings. These ceiling bindings could result in tariffs that were higher than the existing applied rate. The ceiling bindings took effect on the first day of implementation of the Agreement.

Country schedules. The official schedules of subsidy commitments and tariff bindings as agreed to under GATT for member countries.

De minimis rule. The total AMS includes a specific commodity support only if it equals more than 5 percent of its value of production. The noncommodity-specific support component of the AMS is included in the AMS total only if it exceeds 5 percent of the value of total agricultural output.

EFTA (European Free Trade Association). An international organization with four member countries: Iceland, Liechtenstein, Norway, and Switzerland. The purpose of

EFTA is to monitor and manage relationships among the EFTA States. Iceland, Liechtenstein, and Norway also participate in the EU common market through an Agreement on the European Economic Area (EEA).

EU (European Union). Established by the Treaty of Rome in 1957 and known previously as the European Economic Community and the Common Market. Originally composed of 6 European nations, it has expanded to 15. The EU attempts to unify and integrate member economies by establishing a customs union and common economic policies, including CAP (Common Agricultural Policy). Member nations include Austria, Belgium, Denmark, Germany, Greece, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

GATT (General Agreement on Tariffs and Trade). Originally negotiated in Geneva, Switzerland, in 1947, among 23 countries, including the United States, GATT is an agreement to increase international trade by reducing tariffs and other trade barriers. The agreement provides a code of conduct for international commerce and a framework for periodic multilateral negotiations on trade liberalization and expansion.

In-quota tariff. The tariff applied on imports within the quota. The in-quota tariff is less than the over-quota tariff.

"Like-minded" developing country group. A group of least developed, developing countries that presented a joint proposal at the WTO. The group includes Cuba, Dominican Republic, Honduras, Pakistan, Haiti, Nicaragua, Kenya, Uganda, Zimbabwe, Sri Lanka, and El Salvador.

Market access. The extent to which a country permits imports. A variety of tariff and nontariff trade barriers can be used to limit the entry of foreign products.

Megatariffs. Extremely high tariffs that effectively cut off all imports other than the minimum access amounts granted under the agreement. Some well-known examples of megatariffs resulting from tariffication include the base tariffs calculated for EU tariffs on grains, sugar and dairy products; U.S. sugar, peanuts, and dairy products; Canadian tariffs on dairy products and poultry; and Japanese tariffs on wheat, peanuts, and dairy products.

MERCOSUR. The Common Market of the South (Mercado Comun del Sur) created by the Treaty of Asunción signed by Argentina, Brazil, Paraguay, and Uruguay in 1991. Chile and Bolivia became associate members in 1996 and 1997, respectively.

NAFTA (North American Free Trade Agreement). A trade agreement involving Canada, Mexico, and the United States, implemented on January 1, 1994, with a 15-year transition period. The major agricultural provisions of NAFTA include (1) the elimination of nontariff barriers — immediately upon implementation, generally through their conversion to tariff-rate quotas or ordinary quotas; (2) elimination of tariffs — many immediately, most within 10 years, and some sensitive products gradually over 15 years; (3) special safeguard provisions; and (4) country-of-origin rules to ensure that Mexico does not serve as a platform for exports from third countries to the United States.

Nontariff trade barriers. Regulations used by governments to restrict imports from, and exports to, other countries, including embargoes, import quotas, and technical barriers to trade.

Notifications. The annual process by which member countries report to the WTO information on commitments, changes in policies, and other related matters as required by the various agreements.

OECD (Organization for Economic Cooperation and Development). An organization founded in 1961 to promote economic growth, employment, a rising standard of living, and financial stability; to assist the economic expansion of member and nonmember developing countries; and to expand world trade. The member countries are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States

Over-quota tariff. The tariff applied on imports in excess of the quota volume. The over-quota tariff is greater than the in-quota tariff.

PSE (Producer Subsidy Equivalent). A broadly defined aggregate measure of support to agriculture that combines into one total value aggregate, direct payments to producers financed by budgetary outlays (such as deficiency payments), budgetary outlays for certain other programs assumed to provide benefits to agriculture (such as research and inspection and environmental programs), and the estimated value of revenue transfers from consumers to producers as a result of policies that distort market prices.

Round. Refers to one of a series of multilateral trade negotiations held under the auspices of GATT for the purposes of reducing tariffs or other trade barriers. There have been eight trade negotiating rounds since the adoption of GATT in 1947.

Special and differential treatment. The provision allowing exports from developing countries to receive preferential access to developed markets without having to accord the same treatment in their domestic markets.

Tariff. A tax imposed on commodity imports by a government. A tariff may be either a fixed charge per unit of product imported (specific tariff) or a fixed percentage of value (ad valorem tariff).

Tariff-rate quota. Quantitative limit (quota) on imported goods, above which a higher tariff rate is applied. A lower tariff rate applies to any imports below the quota amount.

Tariffication. The process of converting nontariff trade barriers to bound tariffs. This is done under the UR agreement in order to improve the transparency of existing agricultural trade barriers and facilitate their proposed reduction.

UR (Uruguay Round) agreement. The Uruguay Round of multilateral trade negotiations, conducted under the auspices of the GATT, is a trade agreement designed to open world markets. The Agreement on Agriculture is one of the 29 individual legal texts included in the Final Act under an umbrella agreement establishing the WTO. The negotiation began at Punta del Este, Uruguay, in September 1986 and concluded in Marrakesh, Morocco, in April 1994.

WTO (World Trade Organization). Established on January 1, 1995, as a result of the Uruguay Round, the WTO replaces GATT as the legal and institutional foundation of the multilateral trading system of member countries. It provides the principal contractual obligations determining how governments frame and implement domestic trade legislation and regulations. It is the platform on which trade relations among countries evolve through collective debate, negotiation, and adjudication.

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Summary Report

Introduction

The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) concluded in 1994 with an agreement that fundamentally changed the treatment of national agricultural policies under the multilateral rules of global trade. In the Uruguay Round Agreement on Agriculture (URAA, or the Agreement), members determined that trade-distorting policies are to be disciplined, or constrained, so that agricultural markets can be increasingly directed by market forces rather than government intervention. Members set the implementation period for these reform commitments at 1995-2000 for developed countries, and through 2004 for developing countries (table 1).

The URAA marked a first step in the process of global policy reform. The Agreement provided the starting point for further reform by including a provision that member countries resume negotiations on agriculture by December 31, 1999, one year before the end of the implementation period for developed countries. Although efforts at the WTO's November 1999 Seattle conference failed to initiate a full round of negotiations, agricultural negotiations ultimately began in March 2000. They are being conducted as special sessions of the WTO Committee on Agriculture in Geneva, Switzerland (table 2).

The new negotiations present an opportunity to further reduce policy distortions in global agriculture. Agricultural trade barriers and producer subsidies inflict real costs, both on the countries that use these policies and on their trade partners. Trade barriers help keep inefficient domestic producers in operation, result in forgone opportunities for a more efficient allocation of national resources, and lower demand for trade partners' products. Domestic subsidies may induce an oversupply of agricultural products and help to retain resources in agriculture that can be used more profitably in other sectors. The oversupply of agricultural commodities leads to lower prices and increased competition for producers in other countries and can create the need for export subsidies to dispose of excess domestic production. Consumers are harmed not just by trade barriers, which directly raise the cost of imports, but also by the effects of tariffs and subsidies, which lead to inefficiencies in their economy. When their country produces less than its potential, consumers' incomes and welfare are reduced.

The first objective of this report is to analyze and quantify the global costs of current trade and domestic policy distortions and the potential benefits from their full elimination. While the URAA mandate is to continue a process of reform, this report's hypothetical analysis of the full elimination of agricultural policy distortions helps us to understand what is at stake in global agricultural negotiations. We decompose the global costs and benefits of a full reform by country, commodity, and type of policy. We take into account both the direct effects of tariffs and subsidies in distorting production and consumption decisions, and the long-term effects of these policies on savings and investment decisions, and in slowing development and productivity growth, particularly in developing countries. We base our analysis on current levels of agricultural tariffs, tariff rate quotas (TRQ), domestic support, and export subsidies.[1] In particular, the analysis takes into account that many countries have recently adopted less distorting forms of farm support, and that differences exist in the effects of coupled and decoupled farm subsidies on production and trade.

As mandated in the URAA, the goal of further negotiations will be to continue the process of agricultural policy reform begun in the Uruguay Round. Defining a path toward partial reform can be more complicated than considering the full elimination of tariffs and subsidies. Partial reform requires making an informed choice among potential targets or strategies, and the alternatives are likely to imply different distributions

[1]Analyses summarized in this report use common agricultural policy data from 1998. See appendices 1 and 2 in the full report for data on agricultural policies.

Table 1—Main provisions of the Uruguay Round Agreement on Agriculture

Negotiated Reduction	Implementation Period	
	Developed countries (1995-2000)	Developing countries (1995-2004)
Market access	*Percent*	*Percent*
Average tariff cuts for all ag. products	-36	-24
Minimum tariff cuts per product	-15	-10
Domestic support		
Total cuts in aggregate measurement of support	-20	-13
Export subsidies		
Value cut	-36	-24
Volume cut	-21	-14

Least developed countries were required to bind their tariffs but are otherwise exempt from reduction commitments.
Source: WTO secretariat at www.wto.org

Table 2—WTO negotiations on agriculture: Process and objectives

Venue	Special sessions of WTO Committee on Agriculture, Geneva, Switzerland
Objectives	Continue the process of reform begun in Uruguay Round, taking into account the experience with URAA reductions, the effects of the URAA on world agricultural trade, nontrade issues such as environmental protection and food security, special and differential treatment of developing countries, and other concerns
Scheduled meetings	Meetings for Phase I are March, June, September, November 2000, February, March, June, September, and November 2001
Country proposals	To be submitted to the WTO by December 2000 (with some flexibility through March 2001). Proposals are available to the public at www.wto.org

Source: WTO Secretariat at www.wto.org

of costs and benefits. Also, some domestic farm subsidies are operationally linked with trade policies, and reforms of one policy can affect the costs and benefits of remaining policies. For example, market price support programs that attempt to support a domestic price level for commodities at above the world price can only be effective if there are insulating trade policies in place. Imports must be prevented from entering the high-priced market and export subsidies may be needed to help dispose of high-cost domestic production on world markets. Otherwise, the country will likely need to embark on costly stock holding programs to support prices. Reforming trade policies alone removes an important instrument of domestic support and implies that some domestic programs are likely to be effectively restrained by trade policy reforms. Understanding and quantifying these interrelationships whenever possible can help to clarify the choices to be made among options for policy reform.

The second objective of this report is to analyze alternative policy reform options that are defined as broad or generic, rather than specific options as proposed by WTO member countries. Our analysis of options for policy reform is organized to address these questions:

- What are the potential effects on U.S. and world agriculture of alternative approaches to improving market access, including options for making tariffs lower and more uniform, and for liberalizing tariff rate quotas?
- What are the potential effects on U.S. and world agriculture of alternative approaches to reducing distorting farm support, including options for making domestic support lower and more uniform, and for reducing domestic support through changes in border measures?
- What are the potential effects on U.S. and world agriculture of eliminating or reducing export subsidies?

- What are the potential effects of further agricultural policy reforms on less developed countries, particularly the least developed?

Provisions of the Uruguay Round Agreement on Agriculture: First Steps in the Reform Process

The URAA provided for disciplines, or global trade rules, governing three areas of national agricultural policies. These areas, sometimes called the three pillars of the Agreement, are market access (tariffs, quotas, and other trade barriers), domestic support, and export subsidies.

The URAA objectives in market access reform sought to reduce barriers to agricultural trade and to make them more transparent. Members committed themselves to convert most nontariff barriers, such as import quotas, to simple tariffs or to a two-stage tariff system called tariff rate quotas. TRQ's allow imports at a relatively low tariff within a level, or quota, that was to be expanded over the implementation period. Over-quota tariffs and simple agricultural tariffs are to be reduced over the Agreement's implementation period of 1995-2000 for developed countries and 1995-2004 for developing countries.

The URAA provided for a 20-percent reduction of countries' aggregate levels of distorting domestic support during the implementation period. The Agreement defined an aggregate subsidy measure, the Aggregate Measurement of Support (AMS), as a means to quantify and compare countries' annual levels of domestic support that are subject to URAA disciplines. Reduction commitments during the URAA implementation period were made from a base AMS, defined for each country as the average of its total support for all commodities from 1986 to 1988. The URAA also differentiated domestic support policies according to their effects on production and trade (table 3). "Amber box" policies that directly subsidize production and influence the decision to produce were included in the calculation of the AMS and made subject to reductions. "Green box" policies, or domestic farm programs that meet certain criteria for causing minimal trade distortions, were exempted from any expenditure limits. The URAA made an exception for "blue box" policies, or distorting farm subsidies that are linked with supply limitations. The Agreement allowed these subsidies because the supply limits partially offset the subsidies' incentives to over-produce and disrupt global trade.

The URAA disciplined export subsidies by placing both the value and the volume of subsidized exports under limits that are scheduled to decline through the implementation period.

Other provisions of the URAA addressed the concerns of developing countries, and included "special and differential" treatment in addition to longer implementation periods. The URAA granted exemptions to their domestic support policies because of the subsidies'

Table 3—Treatment of domestic agricultural support in the Uruguay Round Agreement on Agriculture

Category	*General criteria*	*Examples of policies*
Exempt support (green box)	Measures must be financed by the government rather than consumers and must not provide price support to producers Specific criteria are defined for general government services, public stockholding, domestic food aid, direct payments, and other programs	Green box programs include direct payments to farmers that do not depend on current production decisions or prices, disaster assistance,and government programs on research, extension, and pest and disease control
Exempt direct payments (blue box)	Direct payments under production-limiting programs must be based on fixed area or yields, and cover 85 percent or less of the base level of production or head of livestock	Blue box policies are direct payments to producers, linked to production of specific crops, but which impose offsetting limits on output
Nonexempt support (amber box)	Market price support, nonexempt direct payments and any other subsidies not specifically exempted are subject to reduction commitments	Amber box policies include market price supports, and output and input subsidies

Source: Annex 2, Uruguay Round Agreement on Agriculture, WTO.

roles in supporting agricultural and rural development. The least developed countries received exemptions from any reduction commitments.

The URAA set up a Committee on Agriculture to monitor implementation of the Agreement as well as the possible negative effects of the reform program on the least developed and food importing countries. The Committee is now conducting agricultural policy reform negotiations in special sessions under the URAA's "built in" agenda. The negotiations take into account the experience during the URAA implementation period, the effects of the reduction commitments on world agriculture, nontrade concerns, special and differential treatment for developing countries, and the shared commitment to establish a fair and market-oriented agricultural trading system.

The URAA Reforms Prove Fragile

The experience to date from the URAA implementation period shows that agricultural policy reform is difficult to achieve:

- *Trade barriers remain high.* In the URAA, countries agreed to reduce their average agricultural tariffs, but the rates remain high. The global, unweighted average bound rate for agricultural commodities is 62 percent; the average bound rate of industrial countries is 45 percent. (The bound rate is the upper limit on tariffs allowed by the URAA). Also, tariffs among countries and across commodities exhibit substantial disparities. Disparities across commodities, for example, tariffs that escalate from bulk to processed agricultural products, can increase the distorting effects of tariffs. TRQ's have replaced many nontrade barriers, but some TRQ's have complicated import regimes, often with procedures that are not transparent, and many have very high over-quota tariffs.
- *Domestic support recently increased.* Although domestic support levels declined early in the implementation period, and some countries shifted part of their domestic support into less distorting programs that are exempt from global trade disciplines, domestic support has recently increased in some countries in response to low world prices since 1998. Even though the URAA placed limits on total, nonexempt domestic support expenditures, there continues to be a disparity in support levels among countries and across commodities.
- *Unused export subsidy credits now brought forward.* The URAA placed constraining limits on export subsidies for individual commodities, but allowed for some flexibility. Lower usage levels early in the URAA implementation period, when prices were high, enabled some members to bring forward unused levels and apply the subsidies when prices were low and ceilings had been reached.

The Costs of Agricultural Policy Distortions

Global agricultural policy distortions impose substantial costs on the world economy. Agricultural tariffs, domestic support, and export subsidies leave world agricultural prices about 12 percent below levels otherwise expected. Over the long term (about 15 years), these distorting farm policies will reduce world welfare, or consumer purchasing power, by $56 billion annually, which represents about 0.2 percent of global GDP (table 4).

As measured by world price effects, a small number of countries cause most of the agricultural market distortions — developed economies account for nearly 80 percent of the distortions. The EU accounts for 38 percent of world price distortions, compared to Japan plus Korea (12), the United States (16), and Canada (2) (table 5). Countries typically use different mixes of policies. The EU accounts for over 90 percent of global export subsidy expenditures; these subsidies are an integral part of its domestic price support system. The EU and the United States account for most of the global distortions related to domestic producer support. Most other countries rely mainly on tariffs to support their farm sectors. Particularly in developing countries, tariffs are a more practical farm support policy because they raise government revenue, while domestic programs entail government expenditure. Tariffs are a potentially more distorting type of farm support than domestic producer subsidies, because they directly affect consumers as well as producers.

What is "welfare"?

Welfare is an aggregate indicator for the world and for individual countries. Trade policy reforms allow resources to shift into the production of commodities in which the country holds a comparative advantage, and allows consumption to shift toward goods desired by consumers. Increased production efficiency leads to higher incomes, lower prices, and increased purchasing power. Consumption changes reflect a better match of the availability of products with consumer preferences. Despite higher world prices for food, most consumers will still benefit because consumer prices will fall in countries where the removal of tariffs more than offsets the change in world prices. The measure of welfare is "equivalent variation," a measure of the dollar equivalent of an effective change in national income, or purchasing power, due to the policy reform.

Table 4—Welfare impacts from elimination of global agricultural tariffs and subsidies

	Static	Static plus dynamic	
	Resource allocation gains	Investment growth gains	Investment growth plus productivity gains
		$US billions	
World	***31.1***	***36.3***	***56.4***
Developed country group	***28.5***	***29.7***	***35.1***
Australia and New Zealand	1.6	3.4	3.5
Canada	0.8	1.2	1.4
EFTA	1.7	0.1	0.2
European Union	9.3	8.2	10.6
Japan and Korea	8.6	5.1	6.2
United States	6.6	11.8	13.3
Emerging and developing country group	***2.6***	***6.5***	***21.3***
China	0.4	1.8	2.23
Latin America	3.7	4.7	6.1
Mexico	-0.2	0.1	1.6
Other Asian countries	1.5	0.3	5.11
South African countries	0.3	0.5	0.8
Rest of world	-3.1	-0.4	5.4

Static gains refer to the annual gains due to removing distortions to production and consumption decisions in 1997 $US billion. Dynamic gains include effects related to cumulative increases in savings, investment, and productivity over a 15-year post-reform period. Dynamic welfare impacts are the annual level about 15 years after reform.

Source: Diao, Somwaru, and Roe (2001).

Table 5—Effects on world agricultural prices of eliminating agricultural policy distortions, by country and policy

	World	U.S.	EU	Japan/Korea	LDC's
Elimination of:			*Percent change from base price*		
All policies	11.6	1.8	4.4	1.5	2.3
Tariffs	6.0	0.7	1.5	1.4	2.3
Domestic support	3.6	0.9	2.0	0.2	Na
Export subsidies	1.5	0.1	0.9	Na	0.0

Na = not applicable, no policy in use. Numbers do not sum to row and column totals because only selected countries are included and there are interaction effects among policies.
Source: Diao, Somwaru, and Roe (2001).

The Benefits from Eliminating Agricultural Policy Distortions

There are two dimensions in calculating the potential welfare gains following policy reform: static gains and dynamic gains. The first is related to removing distortions in consumption and production decisions. "Static" gains accrue after producers and consumers fully adjust to price changes when tariffs and subsidies are removed. These static welfare gains accrue over time and reflect changes in income (wages, land rents and returns on capital investments) due to increased economic efficiency. These static gains in welfare, or purchasing power, are worth about $31 billion to the world economy. Most of the static gains from trade liberalization accrue to countries with the largest initial policy distortions. Developed countries receive most of the global, static welfare gains from full policy reform ($28.5 billion), compared to the potential welfare gains for emerging and developing countries of about $2.6 billion. Despite higher world food prices, consumers in most countries would still benefit from the reforms because tariff elimination lowers the consumer price of imported foods, and the policy reforms produce overall economic efficiency gains in their economies. Some food-importing countries face static welfare losses from full trade liberalization because they do not have large initial policy distortions and they must pay higher world food prices.

Additional global benefits from full policy reform will come from the "dynamic," long-term effects from increased savings and investment as policy distortions are removed, and from the opportunities for increased productivity that are linked to more open economies. When these potential dynamic gains are taken into account, all countries can benefit from global policy reforms. Reforms lead to higher investments by increasing the potential returns. Higher investment increases the productive capacity of economies. The greater openness of economies can lead to higher productivity, especially in developing countries where there is substantial potential for productivity gains from increased training and the technological change that is embodied in investment goods imported from developed countries. Reflecting their greater dynamic potential for growth, developing countries stand to attract increased global investment, which will benefit developing countries by increasing their resource availability and benefit developed countries by creating investment opportunities. Investment growth and productivity gains due to agricultural policy reform account for 45 percent of the total benefits from full trade liberalization.

Whereas developed countries will accrue most of the static gains, emerging and developing countries will accrue most of the potential dynamic gains from full trade liberalization. Developing countries, even food importing ones, can expect to benefit if the negotiations eliminate global policy distortions. But, it is developing countries' own, full participation in global reforms, especially the reduction of their own barriers to imports, that is their most important source of potential benefits from global agricultural negotiations. In the long term, developing countries' welfare could increase by $21 billion annually—nearly 40 percent of the potential world welfare gain from agricultural policy reform.

Nearly one-quarter of the global welfare benefits ($13.3 billion annually) would accrue to the United States. Because U.S. tariffs, domestic support, and export subsidies are relatively low, most of the benefits for the United States come from our trade partners' policy reforms. Although dynamic gains will not directly create many benefits for the United States, mainly because of its technological maturity, U.S. agriculture will benefit substantially from the dynamic gains in developing countries. These countries are important U.S. export markets whose demand for U.S. farm products will increase further if their economies realize their growth potential. In the long run, full poli-

cy reform could lead to an increase in the real value of U.S. agricultural exports of 19 percent each year, an increase in agricultural imports of 9 percent, and higher world prices for U.S. exports.

Tariffs Are the Most Distorting Policy, Compared to Domestic Support and Export Subsidies

The full elimination of agricultural tariffs, domestic subsidies, and export subsidies would increase world agricultural prices 12 percent above their expected level (table 5). Eliminating tariffs, which distort both consumers' choice and producers' decisions, would account for most (52 percent) of the potential price increase. Eliminating the agricultural tariffs of the EU alone accounts for 25 percent of the tariff-induced price effects. Agricultural tariffs in Japan plus Korea, and in the United States, account for 23 percent and 12 percent, respectively, of the tariff-linked price distortions. Tariffs in developing countries account for 38 percent of the tariff-linked effects on world agricultural prices.

The relatively large role of tariffs in global policy distortions should be interpreted in terms of tariffs' links with domestic support. Tariffs are a trade policy that provides a margin of protection to domestic producers. By restricting imports, tariffs are also an instrument of domestic support. Tariffs can help to support domestic prices at above world price levels without the need for government outlays on price support payments or stock building. Most countries' domestic price support programs have a greater reliance on tariffs, which increase government revenues, than on domestic subsidy expenditures, such as deficiency payments, which must be financed through government budgetary outlays. The AMS accounts for this link by including the effects of trade policies (measured as a price gap between an administered support price and the fixed world reference price) in the calculation of domestic support. Removing tariffs alone can therefore accomplish both trade liberalization as well as a reduction in the value of domestic support.

This analysis of domestic *subsidies* includes only budgetary outlays on output and input subsidies and farm payments. This is a more narrow measure of domestic *support* than the AMS, which also includes the effects of trade policies. But to include the market price sup-

Effects of assumptions about decoupling on the analysis

Since the Uruguay Round concluded, some countries have adopted less distorting farm programs that meet the criteria in Annex 2 of the URAA for being exempted from WTO disciplines. The U.S. Production Flexibility Contract (PFC) payments provided under the 1996 Fair Act are an example of exempt payments to farm households. These whole-farm payments are not linked to production of specific crops and so do not create inter-crop distortions. Farmers make their crop mix decisions in response to market price signals. But as experience with these programs grows, the extent to which farm household transfer payments may affect aggregate, total farm production has become the subject of debate. Tielu and Roberts (1998) describe several ways in which payments that are "decoupled" — meaning that they do not directly depend on or influence farmers' production decisions — may still stimulate aggregate production: Payments may lead to increased farm investment by increasing wealth and lowering risk. Payments can reduce farm exit by raising land values, and may encourage continued output by creating expectations of future payments. There is limited empirical research suggesting that the aggregate output effects linked to the effects of wealth on investment and risk are likely to be small (Young and Westcott, 2000; Burfisher, Robinson, and Thierfelder, 2000). In this report, we assume that transfer payments to farm households have minimal output effects. We only account for the indirect effects that these payments may have on farm output through their effects on raising household income and aggregate demand for all commodities, including food. To see how important this assumption is, we analyze the effects on the aggregate world agricultural price due to the removal of all domestic subsidy expenditures by developed countries. We compare the effects when using our assumption that transfer payments have minimal output effects, with the extreme assumption that these payments are fully coupled output subsidies. They are assumed to directly stimulate increased output by increasing the returns to commodities, with our commodity allocation of whole farm payments based on their commodity-linked allocation in the OECD PSE database. We find that the assumption about coupling has small effects on the results of our analysis. The world agricultural price index from a full domestic subsidy removal by developed countries would increase 4.8 percent if the transfer payments are considered to be fully coupled, compared to an increase of 3.6 percent if they are minimally coupled. The small difference in effects due to extreme assumptions about the degree of coupling of household payments suggests that the potential benefits from reducing these kinds of programs may be quite small.

port component of the AMS would be to double-count the effects of tariffs and export subsidies. Domestic subsidies have a smaller role than tariffs in causing distortions from agricultural policies, accounting for 31 percent of the total agricultural price impacts of the three policies. One reason is because domestic production subsidies are less distorting than tariffs. They distort only the production decision and have only indirect effects on consumers. Also, there has been a shift in the way that some countries provide domestic subsidies to farmers. The provision of subsidies to farmers through output or input subsidies has declined, while the use of less distorting, green box policies such as direct transfer payments to farmers has increased. Transfer payments to farm households have smaller effects on farm output than production or input subsidies. Furthermore, we analyze the elimination of domestic subsidies in member countries of the OECD only, because data on domestic subsidies in other countries are not available. This does not bias the analysis very much, since the use of domestic subsidies in non-OECD countries is limited.

The EU has a relatively high level of distorting domestic agricultural subsidies. This characteristic, plus the EU's importance in world markets, accounts for its large role (56 percent) in causing the world price distortions due to domestic subsidies.[2] U.S. domestic programs account for 25 percent of the global price distortions caused by domestic subsidies.

[2]EU compensatory farm payments are linked to set-aside requirements. These requirements are represented in the model by increasing the agricultural land area by 10 percent when these blue box programs are removed. EU dairy subsidies are included in this global analysis, but excluded in the country study of EU export subsidy elimination described later in this report.

Export subsidies account for a relatively small share (13 percent) of the total price distortions caused by agricultural tariffs and subsidies. Most of the world price effects from eliminating export subsidies are due to EU liberalization, reflecting that the EU accounts for most of world export subsidy expenditures.

Despite their relatively small aggregate price effects, export subsidies play an important role in the reform process. Tariffs and domestic support policies of many countries contribute to distorted global markets. The global effects of export subsidies, however, are mostly attributable to a single region, the EU. Export subsidies significantly affect trade in some markets, create increased competition that strains trade relationships, and are an integral part of related domestic price support programs.

The separate roles of tariffs, domestic subsidies, and export subsidies in distorting world prices add up to less than 100 percent of the total price distortion of all policies; the simultaneous removal of all three policy types additionally takes into account their interactions.

Commodity Impacts of Full Agricultural Policy Reform

The aggregate agricultural price impact (12 percent) can be broken down by commodity and by policy type (table 6). The largest increases in world price, above trend levels, will occur in livestock and products (including dairy products), wheat, sugar, and other grains. Elimination of tariffs alone will have the greatest effect on livestock and sugar prices, while the elimination of domestic subsidies will affect mainly wheat and other grains. Export subsidies have depressed global prices mainly for sugar, livestock and products (including dairy products), fruits and vegetables, and wheat.

Table 6—Increase in world prices resulting from the elimination of all policy distortions, by commodity and policy

Commodity	Full policy elimination	Global tariff removal	OECD domestic subsidy removal	Global export subsidy removal
		Percent change from base		
Wheat	18.1	3.4	12.0	2.0
Rice	10.1	5.9	2.4	1.5
Other grains	15.2	1.4	12.2	0.6
Vegetables and fruits	8.2	4.9	-0.1	3.0
Oil and oilseeds	11.2	3.1	7.8	0.1
Sugar	16.4	10.9	1.6	3.3
Other crops	5.6	4.2	1.2	0.1
Livestock and products	22.3	12.2	5.5	3.1
Processed foods	7.6	4.8	1.8	1.0

Source: Diao, Somwaru, and Roe (2001).

Options for Market Access Reforms

There are no unambiguous rules for undertaking a process of reform. Planning reform requires making an informed choice among potential targets or strategies, and each option is likely to imply different distributions of costs and benefits. And, because trade and domestic policies are operationally linked, independent reforms of one pillar can be expected to have an effect on the costs and benefits of the others. WTO member countries have proposed numerous options for achieving further agricultural policy reform. Rather than analyze specific country proposals, we analyze generic options for achieving further, partial reforms of market access, domestic support, and export subsidies. Our framework takes into account the current structure of agricultural policies, differences in policies' effects on production and trade, and the interdependence of their operation and reform.

Options for Liberalizing Tariffs

In the Uruguay Round, members agreed to "bind" their tariffs, meaning that they would not raise their tariffs above a certain fixed, or bound, level subject to negotiating compensation to other countries. The bound rates became the base rates from which reduction commitments were calculated. Industrial countries bound most tariffs (including the over-quota tariffs of TRQ regimes) at the 1986-88 average levels of tariffs actually applied to imports, or "applied" tariffs. Many developing countries set their bound rates at levels well above their applied rates, creating "water" in their tariffs, a buffer zone that may allow the countries to raise their tariffs while remaining within their tariff reduction commitments. In the URAA, countries committed to reduce their simple (unweighted), bound average tariff by 36 percent (24 percent for developing countries), with a minimum cut of 15 percent (10 percent for developing countries) for each individual tariff line.

The URAA approach to agricultural tariff reduction kept in place two characteristics that describe the current profiles of global agricultural tariffs: differences among countries in their average agricultural tariff; and variation, or dispersion, in tariff rates across commodities within countries' tariff schedules. Dispersion of tariff rates, such as the escalation of tariffs with the degree of product processing, can lead to greater distorting effects than uniform tariff rates. Tariff escalation can result in a product's effective tariff protection exceeding its nominal tariff rate if tariffs on the imported intermediate goods used in its production are relatively low. Imposing higher tariffs on processed goods also impedes trade in high value products, the fastest growing segment of world agricultural trade, which tends to be highly sensitive to price. The occasional very high tariff, or "megatariff," which is some-

Modeling the impacts of policy reform on global agriculture

Four different models were used to develop the quantitative analyses of the potential effects of the agricultural negotiations: a dynamic, global computable general equilibrium (CGE) model, a static global CGE model, the European Simulation (ESIM) models, and the Food Aid Needs Assessment (FANA) model. Key features of these models are:

Base year. For the CGE models, the base year is 1997, for ESIM it is 1997/98, and for the FANA model it is the average of 1997-99. The base year is a "representative" year. The models describe how this representative year would change, either in a single long run end-point or annually, due to a controlled experiment in which specific policy reforms occur. The models are not projection models and do not capture the many other forces that are likely to determine what may actually occur in the economies in the long run.

Agricultural policies. The models use common agricultural policy data for 1998, the latest year for which a comprehensive policy database is available. Export subsidy data are from WTO notifications by member countries. Tariff data are from the Agricultural Market Access Database (www.amad.org). We developed a database on domestic support in OECD member countries that is consistent with the concept of the AMS. We include the amber box, domestic expenditure component from the 1998 OECD PSE database; and tariffs and export subsidies for commodities for which administered price support programs were notified to the WTO.

Economic behavior. The models incorporate assumptions about supply and demand responses to price changes in order to represent real world behavior and model results can vary depending on the chosen parameters.

times called a tariff peak, also brings to light another dispersion-related issue. Tariff peaks create large relative price distortions within a country.

The average (simple, unweighted) post-Uruguay Round agricultural tariff rate for industrial countries is bound at 45 percent (fig. 1).[3] These bound tariff rates include the ad valorem equivalents of specific tariffs, which are in some cases very high, and whose values depend on current prices. They also include the over-quota tariffs in TRQ regimes. By including the over-quota tariff, the average bound rate may overstate actual rates of protection. Imports that enter a country within the quota limits are usually subject to a much lower tariff rate, and in some cases, over-quota tariff rates are not actually applied to imports. On the other hand, a country can levy additional fees and taxes on imports, which can lead to bound tariffs providing an underestimate of actual import costs.

The average U.S. agricultural tariff of 11.9 percent is relatively low in comparison with the average agricultural tariffs of the EU (21 percent), Canada (24 percent), Japan (33 percent), and Norway (152 percent).

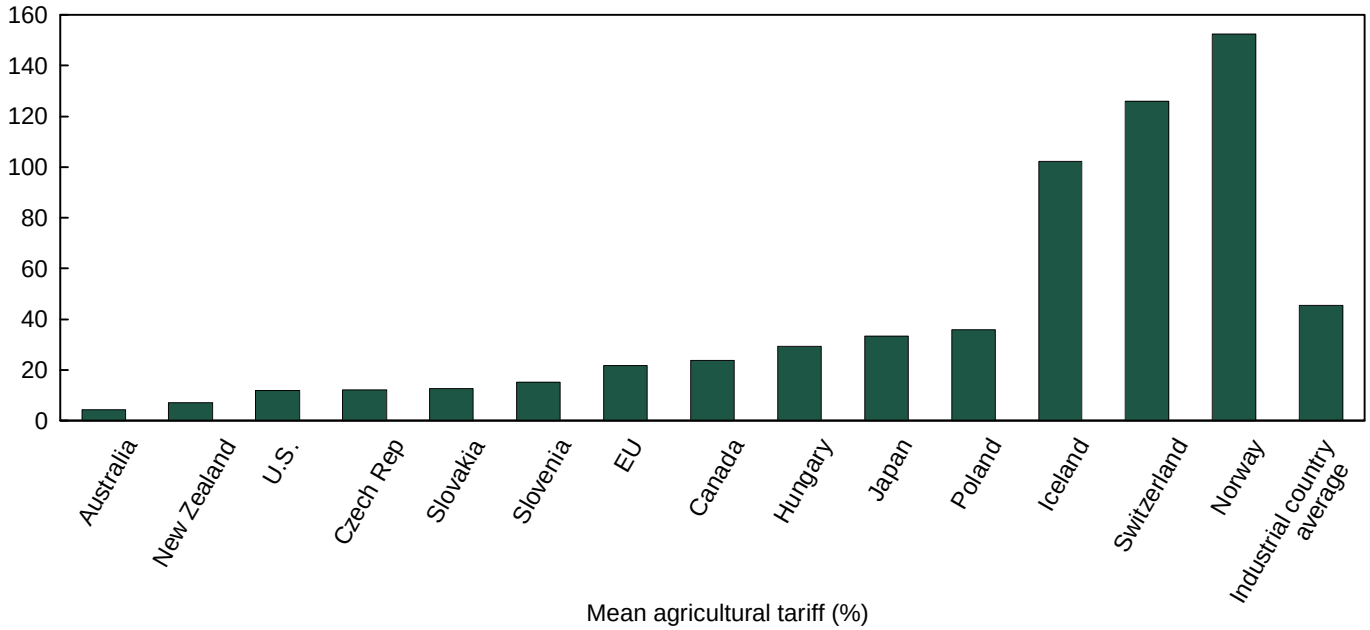
One way to measure and compare tariff dispersion is to analyze the frequency with which countries' tariff lines fall within specified ranges of tariff rates. Figure 2 shows a frequency distribution of selected countries. All of the industrial countries in this analysis have tariff schedules characterized by a relatively large number of low tariffs and a small number of very high tariffs. The United States differs from other industrial countries in that over 50 percent of its tariffs are extremely low, at 5 percent or less, while only a very small share are extremely high, at over 100 percent. All other industrial countries have a much larger proportion of tariffs over 5 percent. For the industrial countries as a whole, nearly 50 percent of tariffs are above 25 percent.

Historically, trade negotiations have taken two broad approaches to tariff reform: formula and sectoral approaches. The formula approach defines some general rule that applies to all tariffs, for example, "reduce all tariffs by 10 percent." Sectoral approaches have been conducted as either bilateral or multilateral negotiations. One bilateral approach is the request-offer

[3]This analysis of reduction formulas focuses on industrial countries only. For more information on world tariffs, see *Profiles of Tariffs in Global Agricultural Markets. Gibson et al. (2001).*

Figure 1

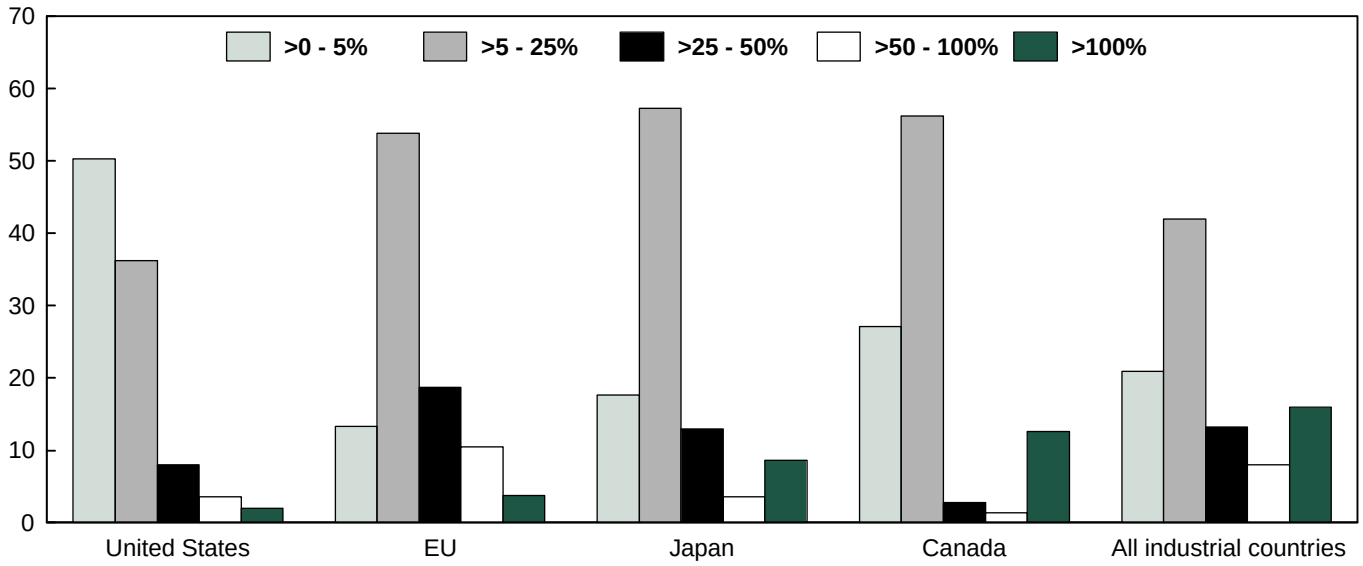
Post-Uruguay Round average agricultural tariffs of selected industrial countries



Source: Wainio, Gibson, and Whitley (2001).

Figure 2

Frequency distributions of agricultural tariffs—selected countries



Source: Wainio, Gibson, and Whitley (2001).

system in which countries draw up lists of the tariffs they want other countries to reduce and the tariffs they are willing to reduce in exchange. An alternative approach is to attempt to solve sectoral problems for a commodity or commodity group on a multilateral basis. A "zero-for-zero" agreement, in which all countries agree on a zero tariff on specific commodities, is an example of a successful multilateral approach. During the Uruguay Round, a zero-for-zero agreement was reached for beer. (A "super zero-for-zero" would address reforms of all three pillars in a sector.) Sectoral approaches can be more effective than formula approaches in achieving greater market access for specific commodities. On the other hand, sectoral approaches can leave protection in place for the least competitive industries, they can create cross-commodity distortions, and they may be unable to achieve deep enough cuts in the very high tariffs that abound in industrial countries' tariff schedules.

While a formula approach has some distinct advantages, it can produce very different outcomes depending on the type of formula that is adopted. There are two generic types of formulas for targeting the level and the dispersion of tariffs: linear reductions and harmonization. A linear reduction formula reduces the average tariff rate by reducing all tariffs proportionately (the dispersion of the tariff would also decline by the same proportion). For example, a country with a uniform tariff (it has zero tariff dispersion) undergoing a linear reduction of 10 percent would reduce its average tariff by 10 percent. Its tariff dispersion would remain unaffected, however, because its tariffs are already uniform. In contrast, harmonization formulas target tariff dispersion. Conceivably, a harmonization formula could require that all countries make all of their tariffs a uniform rate, equal to their average rate. This would leave the average tariff unchanged, but would reduce the dispersion to zero. In practice, many of the tariff reduction formulas proposed in past trade negotiations have included variants that address both tariff levels and tariff dispersion. Many combine some overall reduction of the average rate with harmonization, based on the progressively larger reduction of higher rates, or at least, a requirement that all tariffs be reduced so that the problem of tariff dispersion is not worsened.

What is the most effective formula in terms of achieving greater market access? From a global perspective, a linear formula may be sufficient when tariff dispersion is low. When there is high tariff dispersion, as is the case currently, some harmonization element is needed if the very high tariffs are to be effectively restrained. For individual countries, the effects of tariff reduction formulas will depend on their own tariff profile.

The structure of industrial countries' agricultural tariffs suggests that an effective tariff reduction strategy should address both the mean and the dispersion of tariffs. For illustrative purposes, we show the effects of three tariff reduction formulas on the mean and dispersion of tariffs in the United States, and the average of industrial countries: a linear reduction of 50 percent and two harmonization formulas targeting low tariffs and high tariffs. Table 7 illustrates that harmonization formulas are more effective than a linear approach in lowering the average tariff, because of the many very high tariff lines in the current structure of global tariffs. Formulas that focus on eliminating low, or "nuisance," tariffs have a relatively large effect on the average U.S. tariff, because most U.S. tariffs are low. Formulas such as the Swiss formula, which mandates proportionately larger cuts in high tariffs, have a relatively greater impact on other industrial countries' tariffs than on the United States because most other industrial countries' tariffs have a larger number of higher tariff rates.

Options for Liberalizing Tariff Rate Quotas

The URAA abolished all prior nontariff measures restricting agricultural trade, but allowed members to convert these restrictions into tariff rate quotas. A TRQ is a two-tiered tariff in which the rate charged depends on the volume imported. A limited volume can be imported at the lower tariff — this is the "quota" part of the TRQ — and imports in excess of the quota volume are charged a higher tariff. For most countries, the average in-quota tariff is substantially lower than the over-quota tariff rate. A TRQ, although it contains a quota, is not considered a quantitative restriction because it is always possible to import over the quota. In practice, if the over-quota tariff is set high enough, it effectively deters further imports and so can replicate a quota. An additional provision of the URAA defined a minimum access for commodities previously covered by import restrictions. The URAA set the minimum access, the quantity allowed to be imported at the lower tariff, at 3 percent of consumption in 1986-88 in the base period, to be increased to 5 percent of base consumption by 2000 (2004 for developing countries).

At the end of 1999, notifications to the WTO totaled over 1,300 TRQ's (table 8). Of the 137 WTO members, 37 use TRQ's. Three countries account for one-third of all TRQ's: Norway, Poland, and Iceland together have 431. By comparison, the United States has notified 54 TRQ's. Forty-seven percent of notified TRQ's are actually administered as a simple tariff, that is, there is no over-quota tariff or effective quota. When the TRQ's that behave as tariffs are excluded, the countries with the greatest number of enforced TRQ's are the EU, Hungary, South Korea, and the United States.

The quota element of the TRQ creates the opportunity to earn excess profits, or "economic rents." If the quota places an effective limit on the volume of imports, the importer of goods at the within-quota tariff rate can earn an excess profit, or rent, based on the effects of scarcity in driving up the domestic price that consumers are willing to pay. If some over-quota imports

Table 7—Alternative, tariff reduction: Levels of average tariffs and dispersion

Formula name	Formula	United States		All industrial countries	
		Average	Dispersion	Average	Dispersion
		Percent			
Base	- -	11.9	55.0	45.0	130.0
Linear	50% reduction in all tariffs	6.0	27.5	22.5	65.0
Sliding scale	Eliminate tariffs under 5%, 50% reduction in other tariffs, with a cap of 50% on tariff levels	4.2	8.9	11.3	16.6
Swiss	Progressively larger cuts on high tariffs, with a cap of 45% on tariff levels	5.5	7.4	11.0	12.3

Dispersion is measured as one standard deviation — the average distance of all tariffs from the mean tariff. In the Swiss formula, the reduction parameter is 45.
Source: Wainio, Gibson, and Whitley (2001).

Table 8—Notified and enforced TRQ's, by country

Countries ranked by no. of notified TRQ's			Countries ranked by no. of enforced TRQ's		
Country	TRQ's notified	TRQ's enforced	Country	TRQ's enforced	TRQ's applied as tariff
Norway	232	19	EU	87	0
Poland	109	35	Hungary	68	2
Iceland	90	12	S. Korea	63	1
EU	87	87	U.S.	54	0
Bulgaria	73	45	Bulgaria	45	28
Hungary	70	68	Poland	35	74
Colombia	67	34	Colombia	34	33
S. Korea	64	63	S. Africa	25	28
Venezuela	61	2	Czech Rep.	24	0
U.S.	54	54	Slovakia	24	0
Subtotal	907	419	Subtotal	459	166
All others	461	307	All others	267	476
Total	1,368	726	Total	726	642

Source: Skully (2001).

can enter and be sold at the above-quota tariff rate, then agents with the right to import goods at the lower, within-quota tariff rate can earn rents because they can compete with higher-cost imports. TRQ administration is the process of rationing these profit opportunities. While the GATT established general rules governing how TRQ's should be administered, in practice, there are widely varying interpretations and methods of administration. The most common forms of TRQ administration are "license on demand" and "first-come, first-served" (table 9). Many TRQ's are allocated on the basis of historical market shares. In these cases, the importing agent, rather than the exporter, can capture the economic rent. Because TRQ's create economic rents, they also make it profitable to import from other than the least-cost suppliers, leading to economic inefficiencies in resource allocation.

There Is No Simple Rule for Reforming TRQ's

From a global perspective, there is no single best way to reform TRQ's (table 10). One reason is that individual TRQ's vary with respect to the component of the TRQ (under-quota tariff, quota, or over-quota tariff) that restricts trade. About one-quarter of TRQ's are characterized by a low fill rate, that is imports are less than 20 percent of the quota level. For these TRQ's, if the within-quota tariff is the binding constraint, reducing the within-quota tariff is likely to increase market access.

About one-half of TRQ's have a high-fill rate, that is, imports are at least 80 percent of the quota level. For these TRQ's, and for TRQ's with over-quota imports, reducing the in-quota tariff would have little impact, and the effects of increasing the quota levels is uncertain. On one hand, increasing quota levels can have positive effects if it increases imports and reduces the domestic price, or if it results in the entry of more efficient suppliers. It can also result in the within-quota tariff becoming the binding constraint, an effective reform because the TRQ then becomes a simple tariff regime, and the problems of rents and inefficiencies of suppliers are eliminated. On the other hand, it can have negative effects if it increases the opportunities for economic rents and the entry of inefficient suppliers.

About 25 percent of TRQ's consistently have imports that exceed quota levels. In many of these over-fill cases, the over-quota tariffs are very high. For these TRQ's, the appropriate reform is to reduce the over-quota tariff. Furthermore, reducing the over-quota tariff may always be an appropriate reform, since it is the only policy option on TRQ's that either achieves reform, or does no harm. Alternatively, the reform of over-quota tariffs can be approached through disciplines on tariffs in general, since the over-quota tariff is the same as the bound tariff that was made subject to tariff reduction commitments in the URAA.

Table 9—Methods of allocating right to import within quota

Method of TRQ Administration	Explanation	Percent of all TRQ's
Applied tariff	Unlimited imports are allowed at the in-quota tariff rate: that is, the quota is not enforced.	47%
License on demand	Licenses are required to import at the in-quota tariff. If demand for licenses is less than quota, Q, the system operates like a first come, first served system. If demand exceeds Q, import volume requested is reduced proportionately among all applicants.	25%
First come, first served	The first Q units of imports to clear customs are charged the in-quota tariff; all subsequent imports are charged the over-quota tariff.	11%
Historical	Right to import at in-quota tariff is allocated in proportion to import market shares in a base period.	5%
Auction	Right to import at in-quota tariff is auctioned.	4%
State trader or producer group	Right to import in-quota is granted wholly or primarily to a state trading organization or an organization representing domestic producers of the controlled product.	2%
Mixed	Describes a combination of two or more of the six methods above.	4%
Other, or not specified	Includes methods that do not correspond to any of the seven methods above and are not specified in WTO notifications.	2%

Source: Skully (2001).

Table 10—Impacts of TRQ reforms on market access and quota rents

	Binding constraint in TRQ		
Policy reform	Within-quota tariff	Quota	Over-quota tariff
Lower within-quota tariff	+	-	-
Increase quota	0	?	-
Lower over-quota tariff	0	0	+

Notes: (+) denotes policy reform increases market access and reduces economic rents. (-) indicates the opposite impacts. Zero denotes no effect.
Source: Skully (2001).

Fully eliminating one of the components of the TRQ (either reducing within or over-quota tariff to zero, or leaving the quota level open) is an alternative to reforming one or more components. An infinite expansion of the quota would eliminate the quota problem embedded in TRQ's. If the quota is increased enough, the TRQ would then become a simple tariff regime, and the problems of rents and inefficiencies of suppliers would be eliminated. If the over-quota tariff is eliminated, the TRQ would become a free trade system, since importers of duty-free goods would be unlikely to choose to import within the quota system. If licensing is still required, removing the over-quota tariff would make the problems linked to the opportunity to import under an administered quota system more apparent. Eliminating the within-quota tariff may worsen the distortions of the TRQ if it increases quota rents and (without auctions) the potential for less efficient suppliers to enter the market.

The conditions imposed by tariff administration may act as the binding constraint on trade, in which case the administrative rules should be the target of reform. From a purely economic perspective, the most effective direction for reform of TRQ administration is auctions. Auctions in effect transform a TRQ system back into a simple tariff system. Auctions absorb all quota rents into the equivalent of government tariff revenue and rely on markets to allocate the rights to import or export. Auctions, however, are used for only 4 percent of TRQ's, probably because governments would prefer to simply apply tariffs. Despite the inefficiencies of other types of TRQ administration, TRQ's persist for many reasons, including their linkages to domestic farm support objectives and the underlying political economy of rent-seeking behavior. Market access could be enhanced if existing WTO disciplines on TRQ administration and import licensing were clarified and better enforced.

Options for Reforming Domestic Support

The URAA made an important distinction between domestic agricultural support that significantly distorts production and trade (amber box subsidies), and those subsidies that were agreed to have minimal or no distorting impacts (green box subsidies). Only amber box subsidies were made subject to reduction commitments. (Blue box subsidies were also exempted from reduction commitments because they are linked with offsetting production limits.) Reduction commitments during the URAA implementation period were made from a base AMS, defined for each country as the average of its total amber box support for all commodities during 1986-88.

In 1998 (the base year for this analysis), OECD countries provided levels of amber box domestic support below their ceilings (table 11). Some countries, including the United States and Mexico, achieved these levels by shifting some of their domestic support programs into less trade-distorting programs that satisfied the criteria for being exempt from URAA commitments. Higher world prices during the early implementation period also provided more or less automatic reductions in support levels, making it easier for countries to meet their WTO ceiling commitments.

The URAA left in place an uneven playing field of domestic support across countries and commodities. Those countries with relatively high support levels in the base period continue to have AMS ceilings that allow relatively high support levels, while countries with no support in the base period face constraints in introducing it. In addition to the disparity among countries in total levels of support, there is dispersion in the level of support provided to commodities. Many countries provide most of their support to a small number of commodities.

In the AMS framework, the measurement of domestic support includes both government subsidy expenditures on agriculture, as well as the value of trade policies (measured as the gap between domestic and fixed international reference prices) for commodities that receive administered or guaranteed price supports. Domestic subsidies include output subsidies and intermediate input subsidies. Output subsidies directly stimulate increased production by increasing the expected returns from the subsidized commodity. Subsidies can also be used to provide price support to the farmer through direct payments that achieve a guaranteed return. By not actually forcing market prices in the current period to be equal to the guaranteed price to farmers, these payments may be somewhat less distorting of consumer demand than when market prices are fixed by the government. Subsidies on intermediate and capital inputs raise output by lowering input costs.

Table 11—Reduction commitments if AMS is lowered an additional 20 percent from Uruguay Round ceiling

	Percent AMS ceiling used in 1998	Percent cuts in AMS required to reach additional 20 percent reduction in Uruguay Round 1986-88 ceiling
Australia	23.4	0.0
Canada	8.6	0.0
European Union	74.5	-7.1
Japan	77.2	-10.4
Korea	80.1	-13.5
Mexico	6.6	0.0
Norway	87.8	-21.1
New Zealand	0.0	0.0
Poland	8.3	0.0
Switzerland	71.0	-2.5
United States	44.7	0.0

Only OECD countries represented in the OECD model are included in this table.
AMS = Aggregate Measurement of Support.
Source: Young et al. (2001).

The Link Between Trade Policies and Domestic Price Support in the AMS

The calculation of the AMS explicitly accounts for the operational linkage between trade policies and market price support. The AMS captures how these policies actually work: An effective market price support program requires trade policies to restrict imports and may require export subsidies. In the absence of such a program, domestic price support and storage programs would become too costly. If the new negotiations continue within the framework of the URAA, market access (tariffs and other trade barriers) and export subsidies will be addressed separately from domestic support, but reforms of the three policies are linked. Constraints on trade policies alone could either reduce the effectiveness and current subsidy value of market price support programs as domestic prices fall, or lead to a higher current subsidy value if countries respond with larger expenditures on stock building or price subsidies.[4] On the other hand, constraints on a domestic support program would not necessarily lead to a dismantling of trade barriers. Such barriers can be beneficial to the domestic sectors without the need for administered prices, although the administered prices provide an additional layer of short-run protection to producers. Administered prices create a strong incentive for governments to maintain effective trade barriers, and there can also be greater flexibility to lower trade barriers when administered price supports are constrained.

We analyze AMS reductions by proportionally reducing all amber box domestic subsidy expenditures as well as the applied tariffs and export subsidies whenever commodities benefit from administered market price support programs.[5] This approach is consistent with the AMS accounting framework, which incorporates the operational link between trade and price support policies. In effect, this approach implies that constraints on administered price support programs are achieved through lowering trade barriers.

[4]Technically, the calculation of the AMS as defined in the URAA would not change since it uses the gap between the administered price and a fixed base reference price, instead of the current market price, to calculate the effective level of support.

[5]In this report, we quantify domestic subsidies by applying the AMS concept of amber box domestic support to data from the OECD's PSE database. While the AMS and the PSE are both measures of domestic support, the concepts differ. The PSE is a more up-to-date and comprehensive measure of domestic support, but it includes policies exempt from URAA disciplines and has a broader measure of market support than the AMS. Without further manipulation, the PSE database cannot be used to analyze options for AMS reductions in the WTO. See appendix 2 in the full report for a more detailed discussion.

Lowering AMS Ceilings Versus Leveling the Playing Field

We analyze two approaches to further reform of domestic support policies. These are alternative, generic approaches to reform rather than specific WTO proposals. Similar to the analysis of tariffs, we analyze and compare the effects of reducing countries' overall levels of domestic support with the effects of reducing the dispersion of domestic support across countries and commodities. The first scenario is a continuation of the Uruguay Round's 20-percent reduction of AMS ceilings on aggregate domestic support from uneven 1986-88 base levels of support (to 40 percent below the base). A further cut in ceilings will affect countries differently, depending on the relationship between their current total AMS expenditures and their current commitment levels (table 11). Many countries would not be affected by a further 20-percent reduction in AMS ceilings, including the United States, Canada, Mexico, Australia, and New Zealand. This scenario also leaves in place a dispersion of support across commodities, since it assumes that all program and commodity benefits are reduced proportionally if their current AMS exceeds the new ceiling.

In the second scenario, we "level the playing field" by requiring countries to limit the level of commodity-specific support to no more than 30 percent of their value of production, which is approximately the same level of aggregate support that the EU would be allowed in the first scenario (table 12). Countries that provide less than the maximum levels of support are assumed not to increase their subsidies. Proportional cuts are assumed for all policies for a commodity if the overall subsidy for a commodity exceeds 30 percent of the value of production. Most countries have commodity programs that would be affected by this approach, including the EU, Japan, United States, Canada, and Mexico. This approach achieves significant liberalization in commodities that tend to be most protected, including sugar and dairy.

Tables 13 and 14 show the effects on U.S. bilateral trade under the two scenarios. A further reduction in AMS ceilings would affect the United States mostly through increased demand for U.S. agricultural products by those countries that would be affected by ceiling reductions. U.S. export growth would be largest in oilseeds, meats, wheat, and coarse grains, with most exports going to the EU and Japanese markets. Total U.S. agricultural exports would increase by $900 mil-

Table 12—Commodity-specific AMS: Reduction needed to keep commodity-specific AMS less than 30 percent

	Total	Wheat	Rice	Course	Oilseeds	Sugar
			Percent change from base AMS			
Australia	0	0	0	0	0	0
Canada	0	0	0	0	0	0
European Union	0	0	0	0	0	0
Japan	-19	-65	-64	-56	-17	-51
Korea	0	0	-57	-57	-61	0
Mexico	0	0	0	0	0	-9
Norway	0	-37	0	-31	0	0
New Zealand	0	0	0	0	0	0
Poland	0	0	0	0	0	0
Switzerland	-41	-35	0	-36	-52	-47
United States	0	0	0	0	0	-19

	Milk	Beef & sheep	Other meat	Wool	Horti-culture	Miscella-neous
			Percent change from base AMS			
Australia	0	0	0	0	0	0
Canada	-48	0	0	0	0	0
European Union	-44	-15	0	0	-16	0
Iceland	-63	0	-70	0	0	0
Japan	-62	-6	-11	0	0	0
Korea	0	-27	0	0	0	0
Mexico	0	0	0	0	0	0
Norway	-10	0	-20	0	0	0
New Zealand	0	0	0	0	0	0
Poland	0	0	0	0	0	0
Switzerland	-43	-36	-40	0	0	-40
United States	-49	0	0	0	0	0

Source: Young et al. (2001) based on WTO notifications, OECD PSE data, and ERS calculations.

lion, an increase of about 0.2 percent from 1999 exports. U.S. imports would decline by $20 million.

When commodity support is leveled across countries and commodities, the global reform becomes more broad-based, and the effects on U.S. agricultural trade are slightly larger. Assuming a 30-percent ceiling on commodity subsidies (with subsidies below that level assumed not to increase) the largest export gains for the United States will be for beef, rice, and dairy, mainly to Japan, the EU, and Canada. This analysis does not take into account the potential impacts of other policies, such as EU restrictions on hormone-treated beef. Total U.S. agricultural exports under this scenario will increase by $1 billion. Total U.S. imports will increase slightly ($245 million).

Most of the value of domestic farm support is provided through price support programs, and most price support programs are implemented through trade restraints and export subsidies rather than stock holding or payments to farmers. The dependence of domestic support on trade policies has led some to argue for a strategic approach to negotiations: focus on reducing tariffs and export subsidies, and let tighter trade policy rules force reforms on domestic farm programs. Assuming that countries respond to constraints on domestic support by dismantling related import barriers and export subsidies, the trade policy component of both the AMS scenarios considered here accounts for 83 percent of their global trade effects. This suggests that targeting trade policies alone can implicitly lead to significant reform of domestic support.

Table 13—Changes in U.S. agricultural trade from a 20-percent reduction in URAA AMS ceilings

	Canada	Mexico	EU	Exports EFTA	Japan	Korea	Row	Total exports	Total imports
				Change from base in $US million					
Rice	0.0	-0.1	6.1	0.1	17.0	0.0	0.7	23.9	-0.2
Wheat	0.1	1.6	55.8	3.1	15.0	1.6	63.2	140.5	-1.1
Coarse grains	1.0	-1.4	87.4	3.2	-6.7	-1.1	53.6	136.0	-13.9
Oilseeds	1.3	8.8	190.1	0.7	9.4	4.1	8.1	222.4	-0.2
Sugar	0.0	0.0	1.0	0.0	0.2	0.0	0.1	1.3	-0.4
Cotton and fiber	0.1	-0.1	0.1	0.0	0.6	0.4	0.7	1.8	0.0
Fruit and vegetables	0.0	-0.8	18.4	2.1	40.2	8.9	-3.8	65.1	7.8
Other crops	-0.8	-0.5	-12.6	0.4	3.6	3.4	-5.6	-12.1	11.3
Beef	2.0	-0.3	52.8	1.0	50.6	9.8	10.2	126.0	-13.4
Other livestock	5.2	0.9	17.0	1.4	37.8	14.3	68.4	145.0	-0.5
Dairy products	1.2	4.1	7.0	1.0	20.7	5.7	10.8	50.5	-0.6
Processed foods	3.1	1.5	16.6	0.0	-27.8	-2.7	12.6	3.3	-7.6
Total	13.3	13.8	439.6	13.0	160.5	44.3	219.0	903.5	-18.7

Source: Young et al. (2001).

Table 14—Changes in U.S. agricultural trade from reducing commodity-specific AMS to no more than 30 percent of the value of production

	Canada	Mexico	EU	Exports EFTA	Japan	Korea	Row	Total exports	Total imports
				Change from base in $US million					
Rice	-0.3	-0.4	-1.7	0.6	265.4	0.3	-0.9	263.0	1.6
Wheat	0.1	-0.7	-5.7	9.2	87.9	1.4	41.7	134.0	3.7
Coarse grains	1.6	-0.4	-11.0	8.9	-18.5	-0.4	83.0	63.4	-25.4
Oilseeds	-0.1	-1.6	-19.1	4.2	29.7	21.3	7.3	41.6	0.0
Sugar	0.7	0.3	0.4	0.0	1.2	0.0	2.1	4.9	111.3
Fiber	0.4	0.2	1.1	0.1	2.5	1.6	10.0	15.9	-0.1
Fruit and vegetables	0.9	-0.3	75.0	5.0	-14.3	0.1	8.8	75.4	-2.1
Other crops	-0.2	-0.3	-15.4	-0.5	-2.4	-0.4	-1.5	-20.8	3.7
Beef	10.4	3.2	216.2	5.5	-4.4	23.7	31.5	286.2	-39.0
Other livestock	0.6	0.9	-2.0	1.1	9.5	4.9	8.4	23.5	-1.6
Dairy products	58.6	-21.4	40.0	2.2	164.6	-2.6	-44.4	197.0	173.8
Processed foods	-1.3	0.7	-19.0	-0.6	-19.7	-3.9	4.4	-39.5	18.1
Total	71.4	-19.6	259.0	35.9	501.4	45.9	150.5	1,044.5	244.0

Source: Young et al. (2001).

Options for Reducing Export Subsidies

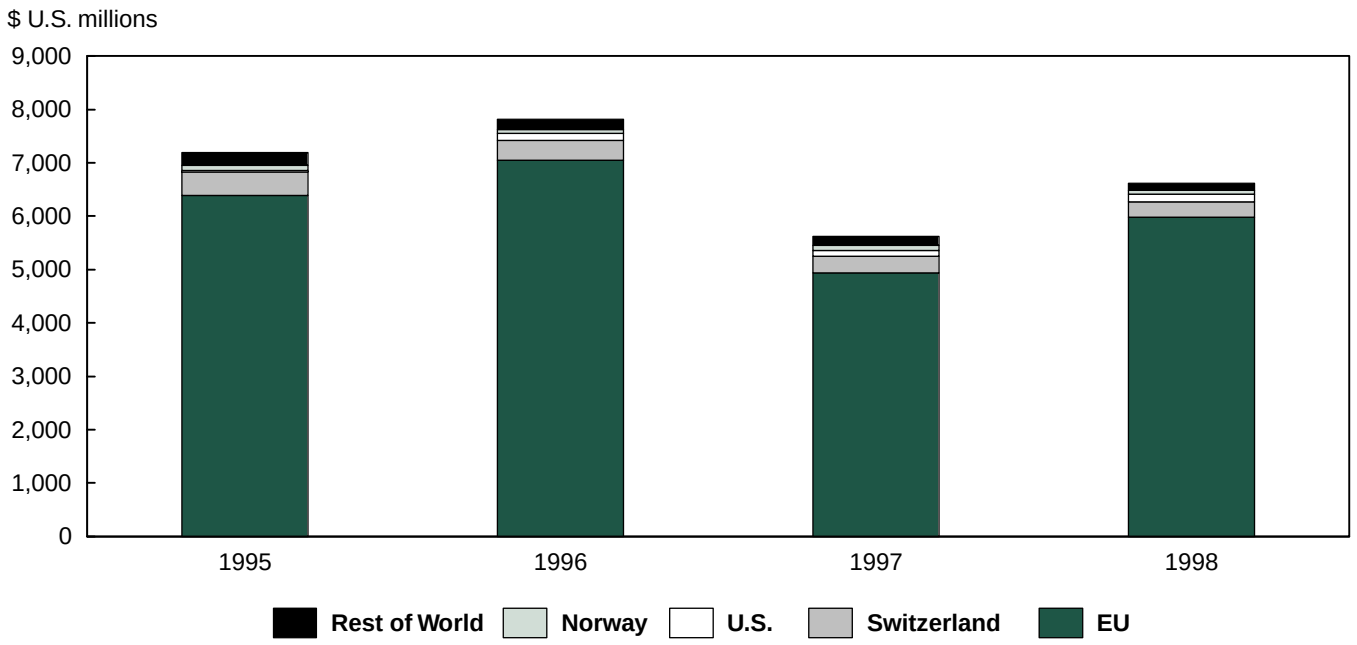
From a global perspective, agricultural export subsidies have smaller impacts than tariffs or domestic subsidies, accounting for 13 percent of world agricultural price distortions due to farm support policies. Export subsidies are nevertheless an important pillar of the reforms. Many countries' tariffs and domestic support policies contribute to distorted global markets; however, the global effects of export subsidies are mostly attributable to a single region, the EU. Export subsidies have significant impacts on trade in some markets and create increased competition that strains trade relationships. And, export subsidy reforms can have significant indirect effects because they help to set the stage for reforms in other areas. Constraints on export subsidies that are used to help dispose of surplus production can create pressures to restructure domestic subsidies in ways that are less distorting of production and trade. In negotiations, export subsidies are directly linked to tariffs because their reduction or elimination may encourage some countries to lower their import barriers.

A detailed analysis of the EU shows that when the links between export subsidies and domestic market price support are accounted for, EU export subsidies have significant effects on world markets and on U.S. production and trade of some commodities. Our analysis focuses on the EU because in 1998 it accounted for over 90 percent of the world's export subsidies (fig. 3). Switzerland accounted for 4.4 percent, the U.S. accounted for 2.2 percent, and all other countries accounted for about 3 percent of global export subsidies. From 1995 to 1998, the EU provided export subsidies on most agricultural exports, including nearly all of its exports of coarse grains, butter and butter oil, beef, and skim milk powder. The commodities included in this analysis are wheat, barley, corn, other coarse grains, oilseeds and their products, beef, pork, and poultry. (Dairy is not included in the model, mainly because dairy quotas in the EU limit any potential change in the sector.) These commodities account for just over 50 percent of EU *expenditures* on export subsidies (not accounting for subsidy expenditures on incorporated/processed products) and roughly 75 percent of the *volume* of subsidized exports.

In our analysis, the EU is assumed to adapt to export subsidy elimination on grains, oilseeds, and livestock by lowering its domestic intervention prices and reducing its exportable supply. This action will lead to

Figure 3

Export subsidy expenditure by country, 1995-98



Source: Leetmaa (2001).

changes in the relative rates of subsidies among crops. The Common Agricultural Policy (CAP), the EU domestic farm program, provides a common price for all grains. Given world grain prices, this common price implies relatively high subsidies on barley and other coarse grains compared to wheat. Oilseed prices are not supported, although grain, oilseeds, and livestock producers all receive direct payments. This domestic price structure has encouraged barley and coarse grain production. Domestic reforms linked to export subsidy elimination will change this relative pricing and lead to a shift in production back to wheat. Lower feed prices will partially offset a major contraction in the EU livestock sector when export subsidies are removed.

The impact of EU export subsidy elimination on world prices would be felt most in the wheat and livestock sectors. In the case of wheat, the world price would decline due to increased EU production and exports. Conversely, world livestock prices would increase as EU exports decline. The expansion of EU wheat production and exports will create increased competition with U.S. wheat, while U.S. production and exports of other grains and meats, and exports of soybeans, will expand (table 15). (EU imports are assumed fixed at minimum access levels, although import barriers would undoubtedly decline if export subsidies and intervention prices were reduced.)

Even if it fully eliminates export subsidies, the EU will still be able to competitively export grains and oilseeds, and some pork and poultry, but will continue to be uncompetitive in exports of beef. However, the EU beef industry could restructure in order to enter into the world's higher quality beef trade. Dairy, wine, horticulture, and some other commodities that benefit from EU subsidies are not included in the analysis.

Approaches to Reforming Export Subsidies: Value Versus Volume Constraints

The URAA approached the reform of export subsidies by placing restrictions on both the volume and the value of subsidized exports. Targeting both components creates effective constraints in times of both high and low prices. When prices are low, both the value and the volume limits act as constraints. Volume limits help to prevent the disposal of excess supply onto export markets, in an effort to raise low domestic prices. Value limits become more binding as prices fall because the subsidy (the difference between the high internal support price and the declining world price) becomes larger. When world prices are high, the value constraint becomes less binding but the volume constraint can still set some limit on export subsidies. Both value and volume limits help to emphasize the link between export subsidies and fixed internal price support programs, since constrained export subsidies can now only partially offset the effects of falling world prices.

In 1995-96, when world prices were high, the EU was constrained more by its volume limits than its value limits. As world prices fell beginning in 1997, the EU's subsidy expenditures and value of subsidized exports increased. Through 1998, the volume limits were more binding on EU exports than value limits, with the exceptions of sugar, processed fruits and vegetables, tobacco, and alcohol. In 1998, the U.S. provided export subsidies on dairy and poultry meats, with dairy reaching 90 percent of U.S. volume limits.

Table 15—EU export subsidy elimination and domestic reforms: Effects on EU and U.S. production and exports

Commodity	EU		U.S.	
	Production	Exports	Production	Exports
	Percent change from baseline volume in 2007/8			
Wheat	.01	19.5	-1.3	-5.5
Corn	Na	Na	0.4	0.6
Barley	-3.2	-32.7	Na	Na
Soybeans	Na	Na	-0.1	0.02
Rapeseed	0.4	-5.5	Na	Na
Beef	-1.7	-100	1.2	5.7
Pork	-4.2	-44	0.5	3.1
Poultry	-4.8	-29.8	0.4	1.1

Na = not applicable.
Source: Leetmaa (2001).

The Impacts of Reform on Developing Countries

Less developed countries (LDC) are a diverse group. They include agricultural exporters and net food importers, countries with adequate or with limited natural and financial resources, and countries in which agriculture accounts for a large or small share of national economic activity. While the interests of an individual developing country are likely to reflect its own mix of characteristics, some developing countries have collaborated to present common positions at the WTO. Some resource-abundant, agricultural-exporting developing countries have joined the Cairns Group, including the MERCOSUR countries, Chile, and Thailand. The group of "like-minded countries" includes least-developed food-importing countries, such as Haiti and Cuba.

LDC's Affected by Both Their Own and Developed Country Reforms

Individually, developing countries are small, price-taking economies in world markets. The potential effects on developing countries from further global agricultural policy reforms can be decomposed into the impacts of reform by large, developed economies on world agricultural markets, and the effects of their own policy reforms (table 16). Unambiguously, further agricultural policy reforms by developed countries will lead to an increase in world agricultural prices relative to their trend levels, and greater market access and higher prices for developing country agricultural exports. If developed countries were to fully eliminate their own agricultural support policies, the value of agricultural exports by all developing countries would increase by about 24 percent. Rising world food prices due to reform in developed countries only would lead to a 2-percent decline in LDC agricultural imports.

Developing countries' reforms of their own policies will lead to increases in both agricultural exports and imports. If LDC's fully eliminate their own agricultural policy distortions, developing countries' agricultural exports will increase in value by 5.5 percent. Under the same scenario, agricultural imports will increase by 25 percent. The expected increase in imports is large because many LDC's have high import tariffs. (This level of import growth is likely overstated because the applied rates of developing countries are often lower than the bound rates used in this analysis.) Global policy reform will result in a 20-percent increase in the value of developing countries' agricultural imports and a 25-percent increase in the value of their exports, indicating the potential for a significant reallocation of production and expansion of trade in response to global reforms.

Developing countries that have the capacity to increase their agricultural export supply would account for much of the increase in exports, especially in products that compete with the temperate products of developed countries. Furthermore, some of the export growth can be expected to embody greater valued added. Many developed countries have escalating tariffs that impede the efforts of developing countries to capture more of the value added in their agricultural exports. Tariff reform or elimination by developed countries can help open up opportunities for agro-industrial development in LDC's that can help to offset the effects of long-term price declines for many primary commodities.

Table 16—Developed and developing country agricultural policy reforms: Effects on developing countries' agricultural trade

	Elimination of developed country agricultural policy distortions			Elimination of developing country agricultural policy distortions	Global elimination of agricultural policy distortions
	Percent change from base				
	Market access	Domestic support	Export subsidies	Market access	All policies
Imports					
Value	0.6	-1.5	-1.1	24.6	20.0
Volume	0.2	-4.7	-2.7	17.1	7.9
Exports					
Value	18.1	5.5	0.6	5.5	26.5
Volume	10.7	3.4	0.3	4.1	16.1

Source: Diao, Somwaru, and Roe (2001).

While lower tariffs in developed countries will benefit some LDC exporters, others will face an erosion of the margin of tariff preference enjoyed by their exports under special, concessional trade agreements. Preferential agreements, such as the Caribbean Basin Initiative between the United States and Caribbean countries, allow many products of least developed countries to enter duty free. The erosion of preferences due to multilateral tariff reductions is expected to have negative but modest effects on the agricultural export earnings of some developing countries. While loss of preferences may erode export earnings in the short term, it may benefit developing countries in the long run. These preferences have in some cases reinforced developing country dependence on the export of a small number of primary commodities, many characterized by long-term declines in price. Recent trends in export growth and commodity composition show that countries with a high dependence on primary commodity exports showed the lowest export growth, while countries that have been successful in diversifying their exports have had the highest export growth. Partner diversification also benefits developing countries.

Food Aid Needs Will Decline Slightly

We analyze the effects of global policy reform on the food aid needs of 67 low-income developing countries. These countries account for 40 percent of the global population. Almost all are food importers and have historically received food aid. The world price of food imports, the domestic supply response to higher world prices, and the availability of foreign exchange to pay for food imports jointly determine food aid requirements. On the import side, higher food import prices reduce the financial import capacity of these countries, but foreign exchange earnings from export growth increases it. On the production side, higher world prices are expected to outweigh the effects of low-income LDC's removal of their own tariffs, leading to a positive supply response. Food aid needs are projected by calculating the difference between per capita food supply (from domestic production and commercial imports) and projected per capita consumption (using either status quo or nutritional consumption targets).

The full global elimination of agricultural policy distortions is expected to reduce global food aid needs by 6 percent. In the absence of any global reforms, the food aid import needs of low-income developing countries (assuming status quo per capita consumption levels) are projected at 12.7 million tons of cereals by 2010 (table 17). If nutritional intake were to improve to recommended Food and Agriculture Organization (FAO) dietary levels, their food aid needs would be 21.9 million tons in 2010. Full global reform will reduce status quo and nutritional food aid needs to 12.0 and 20.5 million tons, respectively. Regionally, Sub-Saharan Africa will gain the most because of its low food import dependency and the high share of agriculture in total exports (fig. 4). The status quo food gap in Sub-Saharan Africa will decline 9 percent. There will be an increase in the food gap in North Africa.

Overall, several factors account for the relatively small impact of global policy reform on food security: In many low-income developing countries, food imports are a relatively small share of the food supply, agriculture's share in foreign exchange earnings is declining, and the food production response to change in world prices is low unless additional investments are made to improve agricultural productivity.

Developing Countries' Own Reforms Are Their Major Source of Gains from WTO

For LDC's, a key issue in the policy reform negotiations will be the flexibility the outcome will permit them in adjusting to more import competition. "Special and differential treatment" is a concept that provides for exemptions or special provisions in inter-

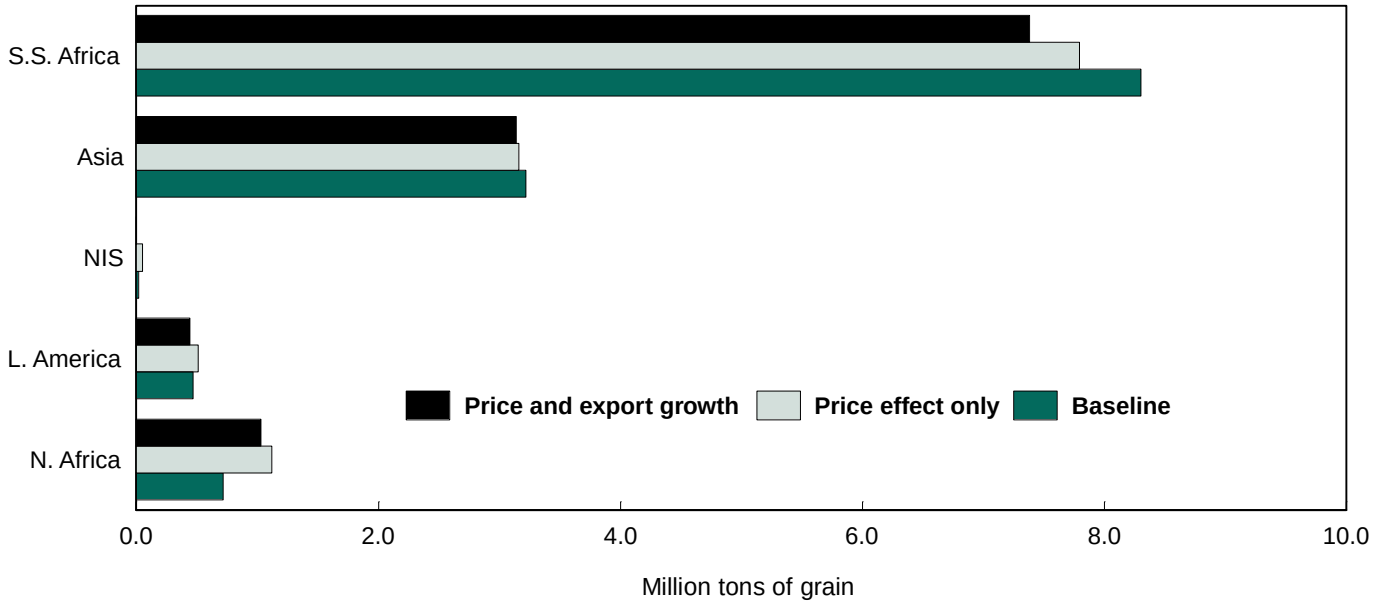
Table 17—Full agricultural trade liberalization: Effects on low-income developing countries' food aid needs in 2010

	Status quo nutritional intake	Adequate nutritional intake
Scenario	*Million tons of grain*	
Baseline	12.7	21.9
Global agricultural price increases	12.6	21.4
Developing country export growth plus price increases	12.0	20.5

Source: Shapouri and Trueblood (2001).

Figure 4

Effects of agricultural policy reform on food aid needs



Source: Shapouri and Trueblood (2001).

national trade rules in recognition of the different economic, financial, and technological characteristics and needs of developing countries. In the URAA, special and differential treatment allowed a longer implementation period for developing countries' reforms and fully exempted the least developed countries from disciplines. Developing countries' proposals in the new negotiations include measures to exempt themselves from domestic support disciplines, higher de minimus support levels, and the right to raise tariffs above Uruguay Round bindings if import competition becomes too disruptive.

Special and differential treatment can be used to facilitate the adjustment of developing countries to more open global markets, based on the recognition that adjustment can be costly, but particularly so for the most vulnerable segments of the world population. In the short run, the global community's role is to provide food aid targeted to the food insecure and technical assistance to facilitate the development of competitive agricultural sectors. In the longer run, improvements in the economic growth and welfare of developing countries will depend on whether these countries' consumers have access to low cost and secure supplies of food, produced at home or abroad under fair market conditions. The supply response of farmers in developing countries will depend on the effective transmission of market price signals. Although import growth may require a managed transition, it is only through a full participation in reform in the longterm that developing countries can fully achieve the potential dynamic gains from trade liberalization. The increased productivity and investment that have been shown to be linked with more open trade policies suggest the long-term benefits to developing countries from their own economic policy reforms can be significant.

Conclusions

The movement toward a more market-oriented and orderly global agricultural trading system is important for the United States because of the large and increasing role of trade in U.S. agricultural production and food consumption. Expanding export markets provides an outlet for U.S. agricultural producers as technological advances and increased productivity lead to higher levels of production. For consumers, trade rules help to ensure access to a safe, varied, and abundant year-round supply of food.

Global agricultural policy distortions impose substantial long-term costs on U.S. producers, consumers, and the world economy. U.S. agricultural tariffs and subsidies are relatively low, suggesting that U.S. domestic adjustments to its own reforms are likely to be small, relative to the potentially large benefits to the United States from global reform. Furthermore, U.S. reforms of its own policies within a global framework can help to ensure the overall, long-term competitiveness of the U.S. farm sector in world markets.

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