IATRC

INTERNATIONAL AGRICULTURAL TRADE RESEARCH CONSORTIUM

Bringing Agriculture into the GATT:

# *ASSESSING THE BENEFITS OF TRADE LIBERALIZATION*

Commissioned Paper No. 2

# BRINGING AGRICULTURE INTO THE GATT

# *ASSESSING THE BENEFITS OF TRADE LIBERALIZATION*

SUMMARY REPORT

Prepared by

THE INTERNATIONAL AGRICULTURAL TRADE RESEARCH CONSORTIUM

# The IATRC Task Force on "Assessing the Benefits of Trade Liberalization"

Philip Abbott
Purdue University
West Lafayette, IN, USA

David Blandford, (co-leader)
Cornell University
Ithaca, NY, USA

Henryka Bochniarz
Foreign Trade Research Institute
Warsaw, Poland

Praveen Dixit
Economic Research Service, USDA
Washington, D.C., USA

Klaus Frohberg
Iowa State University
Ames, IA, USA

Terry Hickenbotham
Economic Research Service, USDA
Washington, D.C., USA

Robert House
Economic Research Service, USDA
Washington, D.C., USA

Brian Johnston
Australian Bureau of Agricultural and Resource Economics
Canberra, Australia

Maureen Kilkenny
Pennslyvania State University
State College, PA, USA

Steven Magiera, (co-leader)
Economic Research Service, USDA
Washington, D.C., USA

Robert McGregor
Agriculture Canada
Ottawa, Canada

Sherman Robinson
University of California
Berkeley, CA, USA

Vernon Roningen
Economic Research Service, USDA
Washington, D.C., USA

Institutional affiliation is listed for informational purposes only. The opinions expressed in this report should not be attributed to any of the organizations listed.

## Background Papers Prepared

Philip Abbott, 'Assessing Benefits from Agricultural Trade Liberalization: Methodological Issues.'

Nicholas Alexandratos and Jelle Bruinsma, 'World Agricultural Trends to 2000.'

David Blandford, 'The Impact of Freer Agricultural Trade: A Review of the Empirical Evidence.'

Henryka Bochniarz, 'The Impact of Trade Liberalization on Centrally Planned Economies.'

Bruce Bowen and Henry Haszler, 'Implications of Phased Reductions in Agricultural Protection'.

Klaus Frohberg, 'The Economy-wide Effects of Multilateral Trade Liberalization by Industrial Market Economies on Canada, Japan, and the European Communities.'

Robert House and Terry Hickenbotham, 'Impacts of Industrial Market Economy Liberalization on U.S. Agriculture.'

Brian Johnston, 'Gains from Liberalization in Australia: Some Recent Results from ORANI.'

Brian Johnston, Barry Krissoff, Vernon Roningen, and John Sullivan, "Economic Effects of Agricultural Trade Liberalization on Developing Countries: A Partial Equilibrium Approach.'

Maureen Kilkenny and Sherman Robinson, 'Intersectoral Effects of Agricultural Liberalization in the United States: Factor Markets and Macroeconomic Linkages'.

Steven Magiera and Michael Herlihy, 'Comparing World Price Changes from Trade Liberalization Models'.

Jaime Quizon, Bruce Gardner, and Lois Quinn, 'Consequences of Agricultural Trade Liberalization for Developing Countries'.

Vernon Roningen and Praveen Dixit 'Economic Implications of Agricultural Policy Reform in Industrial Market Economies'.

This summary report was edited by David Blandford with the assistance of Philip Abbott. Grateful thanks are extended to Carol Peters for assistance in the final preparation of this document.

# Contents

# Preface

The IATRC is a group of more than 80 economists interested in agricultural trade, drawn from the academic community, government, and private institutions in North America and seven other countries. Founded in 1980, the Consortium has the following objectives:

(1) to facilitate and stimulate improvement in the quality and relevance of international agricultural trade research and policy analysis;
(2) to facilitate collaborative research among its members;
(3) to facilitate interaction among researchers and analysts in different countries, universities, and governments engaged in and/or interested in trade research; and
(4) to improve the general understanding of international trade and trade policy issues among the public at large.

In order to further these objectives, the Consortium established three task force groups early in 1988 to examine the issues involved in dealing with agricultural trade problems through the current round of international negotiations under the General Agreement on Tariffs and Trade (GATT). Funding for the three groups was provided by the U.S. and Canadian governments. Summaries of the work and conclusions of the three task forces were presented at the Symposium in Annapolis, Maryland on August 19-20, 1988. The summaries are titled as follows:

(1) Assessing the Benefits of Trade Liberalization
(2) Designing Acceptable Agricultural Policies
(3) Negotiating a Framework for Action.

The more detailed set of papers, upon which these summaries are based, will be published in book form during 1989.

For further copies of these reports or information on the IATRC and its activities, contact:

Professor David Blandford, Chairman
International Agricultural Trade Research Consortium
455 Warren Hall
Cornell University
Ithaca, NY 14853
United States of America
Telephone: 607-255-8187

# ASSESSING THE BENEFITS OF TRADE LIBERALIZATION

What would be the effect of liberalizing agricultural trade? How would domestic and international prices change? Would world trade increase or decrease? What would be the benefits and costs of liberalization? How would these be distributed? How would the rest of the economy be affected? This report seeks to provide answers to these questions by using a series of economic models, the results obtained by other analysts, and the judgement of knowledgeable individuals to assess the impact of agricultural trade liberalization.

World agricultural markets are complex. Countries and commodities are interlinked. Economic models which reflect these linkages must be used in assessing the impact of changes in agricultural policies. The central model used in preparing this report captures the interrelationships in supply and demand for the major agricultural commodities and countries. It incorporates the effects of government policies on supply, demand, trade, and prices. The results derived are used in a more detailed model to evaluate the regional implications of trade liberalization for the United States. The effects of liberalization on developing and centrally-planned countries are assessed. Finally, a series of national economic models for the United States, Canada, Australia, Japan, and the European Community are used to evaluate the broader implications of trade liberalization by examining the interlinkages between agriculture and the economy as a whole.

## International Markets and Public Policies

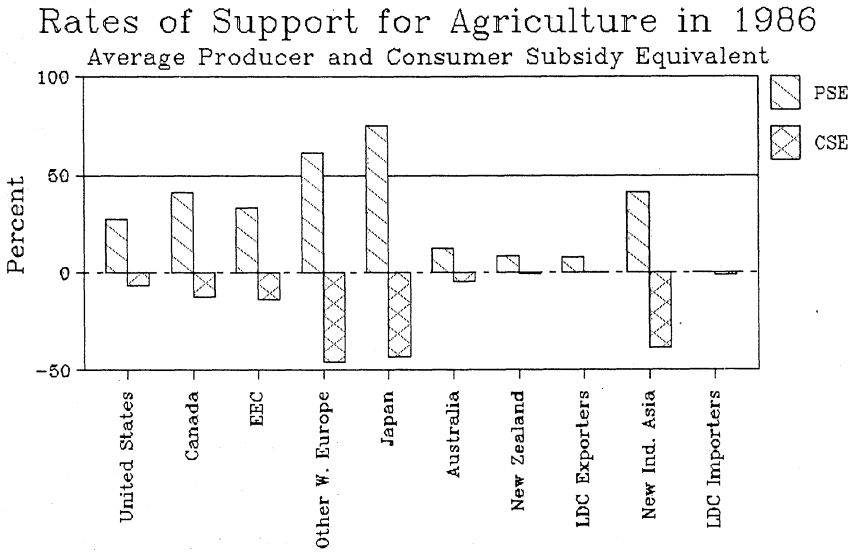
World agricultural markets have become increasingly unpredictable during the last two decades. The 'world food crisis' of the early 1970s prompted predictions of widespread food shortages and higher food prices. Yet over the last 10 years, the growth in world agricultural production has persistently surpassed the growth in consumption. This has resulted in mounting food surpluses and declining international prices. Fears of scarcity in the 1970s have been replaced by a burden of abundance in the 1980s.

Why has this dramatic change taken place? Rapid productivity growth, including the spread of 'green revolution' technology in developing countries, has led to sharp increases in supply. Weakness in the world economy and a slowdown in population growth have dampened demand for agricultural commodities.

Finally, increasing government subsidies to farmers have resulted in enormous excess capacity in agriculture, especially in the richer industrialized countries.

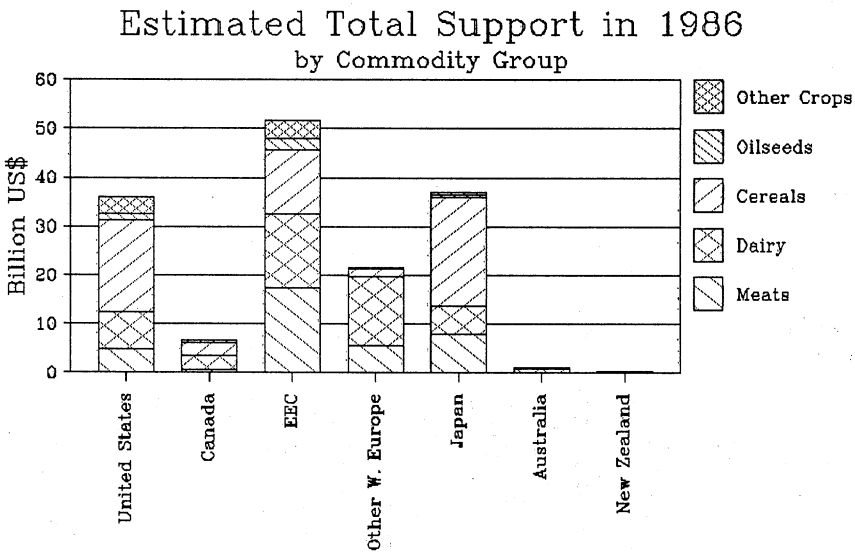
There are several ways of measuring the size of government support for agriculture. Aggregate measures known as producer subsidy equivalents (PSEs) and consumer subsidy equivalents (CSEs) are two indicators which have been widely used in recent years. The PSE measures the gross producer subsidy created by government programs. It includes all the direct and indirect transfers which are made through these programs. Many government policies increase domestic prices. This creates a transfer of income from consumers to producers. The CSE measures the explicit and implicit taxes paid by consumers to support agricultural incomes.

PSEs and CSEs provide a means for ranking protection across countries and commodities. The aggregate PSEs and CSEs for 1986 show that Japan supports its agricultural producers the most, followed by Canada, the European Community, and the United States (see chart below). Among the major industrial countries, Australia and New Zealand have the lowest levels of support. Although the exact figures vary from year to year, these rankings have remained fairly stable during the current decade.



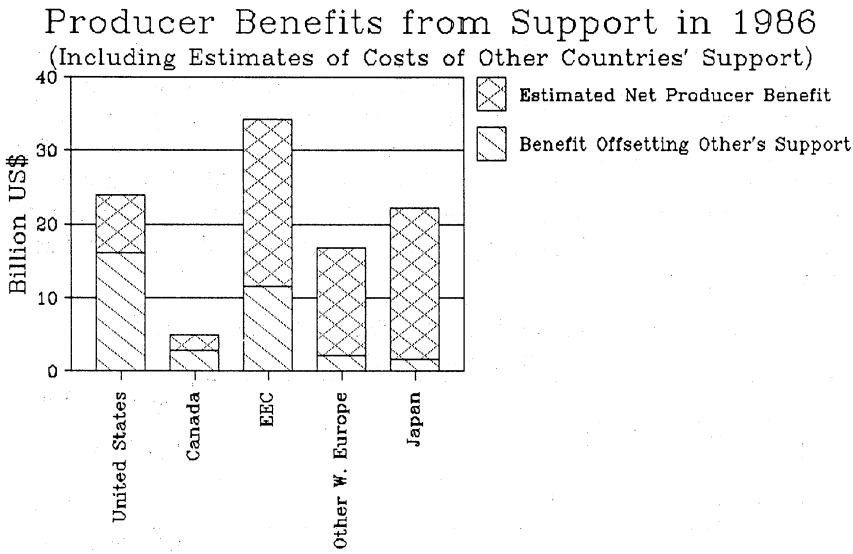

Within a given country, the share of total support for each commodity reflects both its importance in total agricultural production and the level of assistance (see chart on following page). In Canada, Australia, and New Zealand, the dairy industry receives the largest proportion of total support, while in the United States, cereal producers have the largest share. The amount of assistance is distributed about evenly among cereals, dairy and meat in the European Community. Over

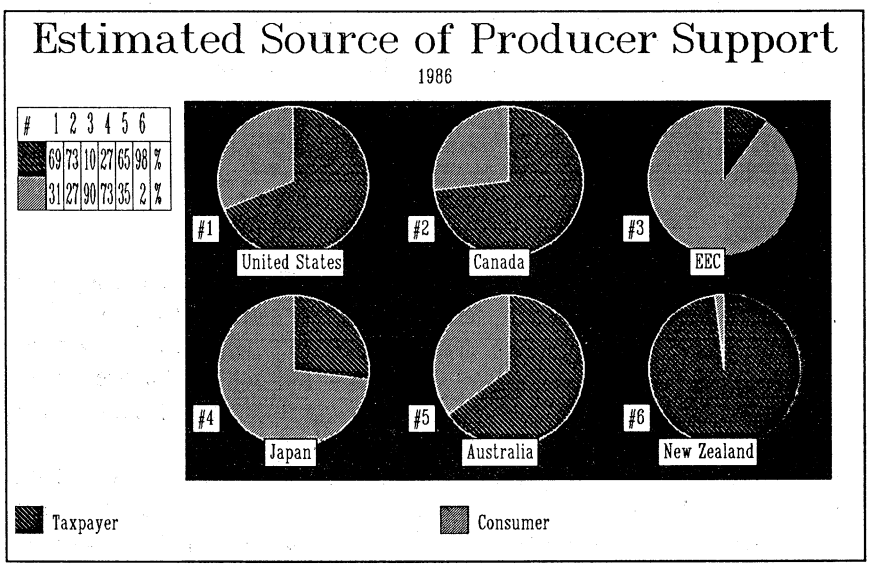
two-thirds of the support for Japanese agriculture goes to cereal producers (including rice), even though the cereals account for only 40 percent of the value of agricultural production. The shares can vary greatly between years. In the United States, cereal producers' share rose from one-third in 1984 to over half in 1986, reflecting the effects of the Food Security Act of 1985. The amount of support is large relative to the value of production for some segments of agriculture, for example U.S. sugar, even though their share of total agricultural support is not great.




The agricultural policies of individual countries affect the costs of support in other countries. Many policies depress consumption and increase production. Imports fall or exports rise and world prices are depressed. This increases the costs of maintaining a given level of support. In the United States, for instance, nearly two-thirds of the support to farmers offsets the losses created by the policies of other industrial countries (see chart on following page).

The costs of producer support have to be borne either through higher food prices or through higher taxes. The distribution of costs varies considerably among countries. In the European Community and Japan, policies that tax consumers account for well over two-thirds of the support to agriculture (see chart on following page). This is reflected in the relatively high CSEs in these countries. In the United States, Canada, Australia, and New Zealand, consumers are taxed less. These countries rely more on direct government expenditures. The distortions in consumer prices — and hence the CSEs — are therefore much lower.




A disconcerting feature of current support policies is the waste that they create. Policies lead to inefficiencies in production and consumption. These inefficiencies are part of the cost of protecting agriculture. Even under the most optimistic assumptions, consumers and taxpayers pay $1.34 for every dollar transferred to agricultural producers in industrial countries. At best, only 75 percent of the total 'tax' levied on consumers and taxpayers is transferred to

agriculture; the rest is lost to society. If the primary objective of policies is to maintain farm incomes, then this could be achieved at much lower costs through alternative policies.

No one can know for sure whether the level of agricultural support will continue at its current high level. Changes in government policies, world weather conditions, and global economic growth make forecasting world prices and support costs extremely risky. In a recent study, the Food and Agriculture Organization (FAO) of the United Nations has taken a close look at long-term developments in world markets. The FAO concludes that global food supply will likely continue to grow faster than demand. Unfavorable economic conditions in many developing countries and lower rates of population growth are expected to depress demand. Technological change will continue to increase supply. The quantity of cereals available for export in the year 2000 at current prices is projected by FAO to exceed import requirements by 120-130 million tons. The export surplus in meat could be almost 10 million tons. If these projections materialize, real world prices will continue to decline and the costs of farm programs for consumers and taxpayers will continue to escalate. Under such a scenario, the reform of agricultural policy is inevitable; the only issue is how this should be achieved.

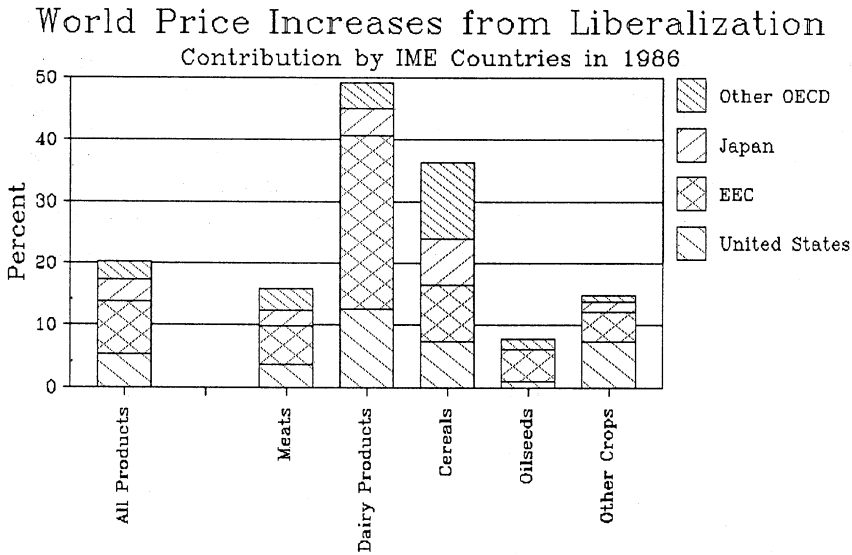
## Agricultural Policy Reform in Industrial Countries

A number of proposals for reform are being discussed under the current round of negotiations under the General Agreement on Tariffs and Trade (GATT). The United States has proposed the elimination of all agricultural subsidies within ten years. The European Community has advocated restricting exports to maintain prices, without fundamentally reforming existing agricultural programs. The difference between these two proposals is enormous. One would lead to greater market orientation; the other would result in the management of international markets by exporters.

The model used to analyze these and other approaches to policy reform uses 1986 as a base year. It incorporates estimates of the level of support, and the actual production, consumption, and trade quantities, and prices for 1986. The model provides indicative estimates of the effects of liberalization on domestic and international markets.

## Elimination of Existing Policies

The elimination of the existing agricultural policies of the industrial market economies (IMEs) would increase world agricultural prices by an average of 20 percent (see chart below). The rise in world prices would be greatest for dairy products, cereals, and meat. Government support is high for these commodities and industrial country trade is a major part of world trade. The prices of oilseeds and products would increase only slightly. Industrial market economies provide only modest support to the producers of these commodities.

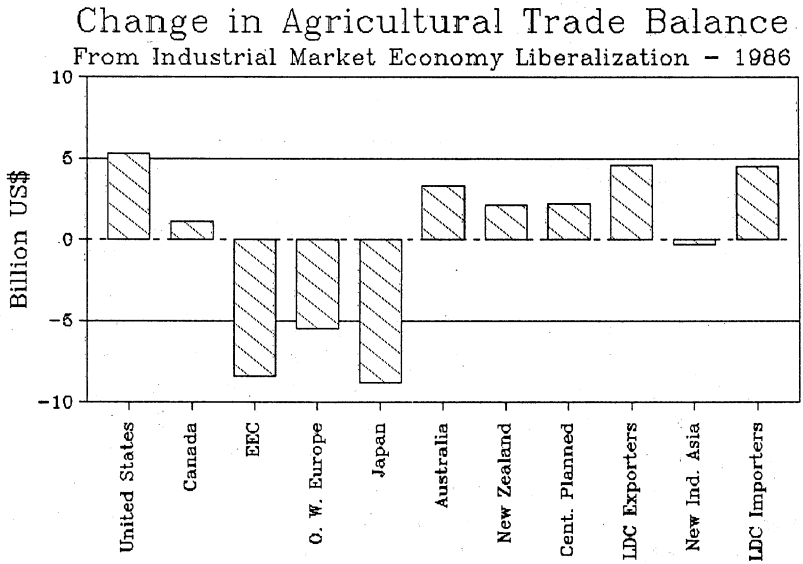



The European Community and the United States would be by far the most important contributors to the change in world prices through trade liberalization. Unilateral liberalization by the European Community would raise world prices by an average 8 percent. This is about 40 percent of the increase when all industrial countries eliminate agricultural support. E.C. policies have the largest price impacts in the dairy, sugar, ruminant meat, and wheat markets.

Unilateral elimination of existing policies by the United States would raise world agricultural prices by 5 percent, or about a quarter of the increase from multilateral liberalization. The rise in cereal prices would be about 8 percent, or one-third of that with multilateral liberalization. This increase is consistent with our earlier observation that cereals have been heavily supported under new farm program legislation. U.S. policies are also largely responsible for the depressed world prices of some other crops, especially sugar and cotton. The elimination of U.S. policies alone for these crops would account for nearly half the increase in world prices from multilateral liberalization.

The policies of Japan and other western Europe individually do not have much influence on international prices, even though their agricultural support is high. These countries are not major participants in world agricultural markets. An exception is Japan in the rice market. Japan's policies affect world rice prices more than all other industrial countries combined. The policies of other industrial market economies — Canada, Australia, and New Zealand — do not individually affect international prices much because of their small trade. However, when taken together, these countries with Japan and non-E.C. Europe would account for nearly a third of the price increase from multilateral liberalization.

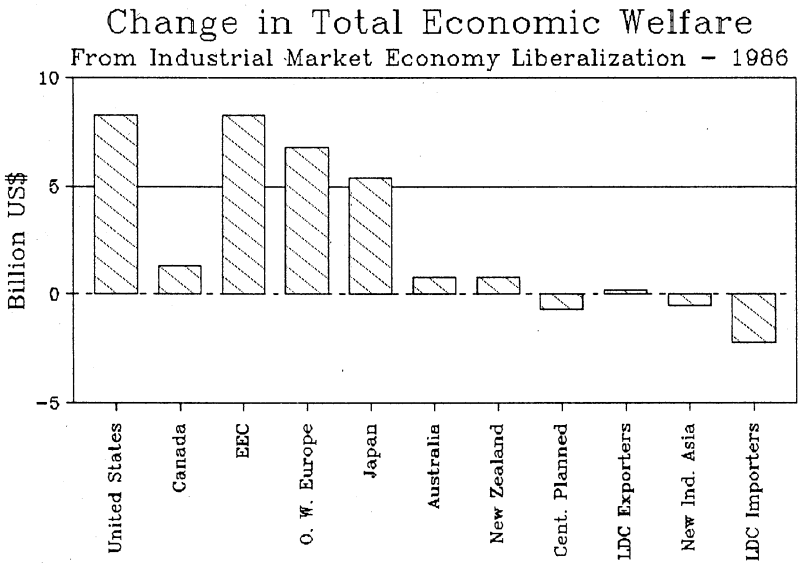
World agricultural trade **volumes** would increase only modestly with trade liberalization. But there would be substantial changes for some commodities. Trade in meat, sugar, and rice would increase substantially, while trade in wheat would decrease slightly. The **value** of world trade would increase substantially with liberalization. With expanded volumes and higher prices, trade in 1986 would have been $23 billion greater, or nearly 40 percent. The United States would improve its agricultural balance of trade by $5 billion annually, while the E.C. and Japanese balance of trade would worsen by nearly $10 billion each (see chart below). Because of the decline in the volume of subsidized exports, net export earnings of industrial market economies would decline by $11 billion.




Aggregate world agricultural production would not change much with trade liberalization, but there would be considerable shifts in production patterns. Net importers, such as the European Community and Japan, who subsidize producers heavily, would produce a lower share of global output. Exporters, such as Australia and New Zealand, who provide very little assistance to agriculture,

would increase their share. Farm output in the European Community and Japan would fall by 20 percent. Output in Australia and New Zealand would increase by 6 to 8 percent. Total U.S. farm output would fall by 3 percent.

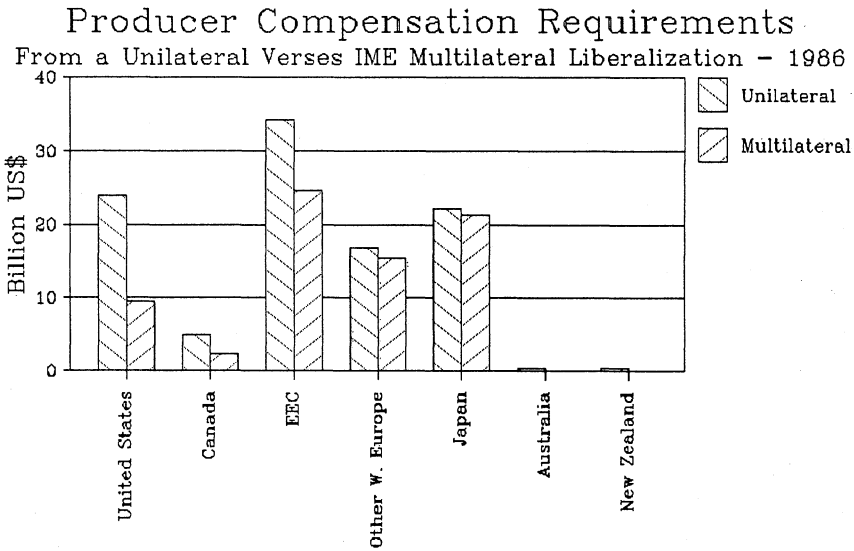
Agricultural trade liberalization would increase the national income of industrial countries. Protectionist agricultural policies have encouraged the inefficient use of resources. Annual efficiency gains would be over $5 billion for Japan and nearly $9 billion for the United States and the European Community (see chart below). On a per capita basis, the country that would benefit the most from trade liberalization would be New Zealand. The net per capita benefits relative to national income for the United States, the European Community, and Japan would be low —less than 1 percent of per capita gross national product.




Consumers in both the European Community and Japan would gain over $20 billion annually with multilateral trade liberalization. Most of the gains would result from the decline in domestic prices following the elimination of consumer taxes. U.S. consumers, on the other hand, would pay an additional $13 billion for food and agricultural products with liberalization. Increases in world prices would be greater than the existing consumer taxes.

Potential producer losses from multilateral liberalization could be of considerable concern in the new round of international trade negotiations. Producers in the United States are likely to lose about $10 billion in net income with multilateral trade liberalization, while those in the European Community and Japan are likely to lose more than double that amount (see chart on following page). In the United States most of these losses result from the elimination of government payments. Rice producers in Japan, beef producers in the European

Community, and grain producers in the United States suffer most. The losses would be even greater if countries were to undertake policy reform individually, without parallel reforms in other industrial nations. Producers would lose much less if all countries reform their policies since world prices would increase. U.S. producer losses would be cut in half by multilateral liberalization while losses in the European Community would be a third less. There are large incentives for the United States and the European Community to enter into a multilateral agreement to liberalize trade. Cooperation is needed to reduce the redistributive effects of policy reform.




It is important to stress that consumers and taxpayers could afford to compensate producers for income losses resulting from freer trade. Direct payments could be made from government revenues and still leave the nonfarm population better off financially from liberal trade. The challenge is to design income support and compensation mechanisms for agriculture which would make policy reform politically possible and would not distort international trade.

## Alternative Approaches

Several alternatives to complete liberalization have been suggested in the current Uruguay Round of GATT. Canada, for instance, has proposed eliminating only 'trade-distorting' subsidies. Some government programs and expenditures, such as those on research and development, which may not distort production would be exempt. The European Community advocates managing exports of commodities in surplus. This is tantamount to fixing market shares. A further

possibility would be to pursue the traditional route of GATT negotiations on industrial products by focusing primarily on the elimination of tariffs. World price changes with the exemption of less-distorting expenditures would be very similar to those under complete liberalization. The 'nondistorting' component of government assistance is small. In contrast, the removal of tariffs alone would have virtually no effect on world agricultural prices because tariffs are a minor component of agricultural policies. If the GATT were successful in converting existing policy measures to tariffs and then reducing these, it could be extremely effective. This approach has been successful in many areas of industrial product trade.

Both full liberalization and the elimination of the most distorting policies would lead to similar increases in world income. Most of the benefits would accrue to taxpayers and consumers in industrial countries. By contrast, implementation of a market-sharing arrangement would generate losses in real income. Even greater distortions would be created by market-sharing arrangements than by current policies. Producers would still benefit from government assistance. Consumers would pay higher prices for food. The costs would increase if other countries refused to participate in the market-sharing agreement. Based on our analysis, market sharing does not appear to provide a cost-effective solution to the problems created by current support policies. The policies themselves must be reformed.

## Regional Implications of Reform in the United States

Trade liberalization may have significantly different regional effects because of the structure of agriculture. Such effects are illustrated with reference to the United States. The U.S. model is different in structure than that used in analyzing the global implications of trade liberalization. The results derived from the multicommodity trade model for 1986 were used as a basis for the regional analysis but was not possible to ensure complete consistency.

With trade liberalization, market prices of most agricultural commodities in the United States would increase. The greatest increases would occur for livestock products, particularly beef. The incomes of crop farmers would fall due to the elimination of government subsidies. Over 40 million acres of cropland (excluding that in the Conservation Reserve) would be brought into production with the abandonment of current programs; about two-thirds of this in the Plains and the Corn Belt. About half of the total would produce crops but 7 million acres would be used to produce hay. Total acreage planted would increase in all regions. The production of grain would tend to become less regionally concentrated due to the elimination of disparities created by existing government programs.

Fueled by an expansion in beef production, feedgrain acreage would rise by 16 percent. Less wheat would be produced. Cotton and rice acreage would fall by 30-60 percent, and there would be major regional adjustments. Rice acreage would fall in the Delta and South Plains and increase slightly in the Pacific. Cotton acreage would fall in the Delta, Pacific and Southeast, remain roughly constant in the Southern Plains and Appalachian regions, and increase slightly in the Corn Belt.

The regional effects of these changes on farm incomes depends upon comparative advantage, crop mix, and current participation in government programs (see table below). When government transfers end, production shifts towards regions with lower costs of production. Largely due to the loss of direct payments, regions which are more specialized in subsidized crops lose relatively more than regions specializing in other crops. The gross value of crops (including direct payments) would decline in all regions: proportionately less in the Northeast and Appalachia; proportionately more in the Delta states, Mountain, and Pacific regions.

**U.S. Regional Impacts of Trade Liberalization, 1986**

| | Farm value of production | | | Income/expenses | | |
|---|---|---|---|---|---|---|
| Region | Livestock | Crops | Total | Gross Returns* | Variable Expenses | Net Returns |
| | - - - Percent changes - - - | | | | | |
| Northeast | 10 | 36 | 23 | -2 | 2 | -12 |
| Lake | 12 | 0 | 6 | -7 | 3 | -21 |
| Corn Belt | 6 | -14 | -6 | -19 | -4 | -35 |
| Northern Plains | 9 | -14 | 0 | -7 | 10 | -20 |
| Appalachian | -1 | 9 | 2 | -3 | 2 | -18 |
| Southeast | 2 | -2 | 1 | -6 | 2 | (1) |
| Delta | 2 | 0 | 1 | -18 | -7 | -43 |
| Southern Plains | 20 | 13 | 18 | 17 | 6 | 29 |
| Mountain | 37 | -18 | 18 | -2 | 2 | -4 |
| Pacific | 24 | 1 | 15 | -14 | -4 | -25 |
| United States | 12 | -7 | 3 | -7 | 1 | -18 |

* Includes loss of government payments.
(1) Estimated to have net losses.

The big gainers under liberalization would be livestock producers, particularly beef producers, even though they have to pay higher prices for feed. The export demand for fed beef increases substantially, raising its price and the earnings of feedlot operators. Feedlots are concentrated in the central and Great Plains states so that these areas would gain accordingly. The Northern Plains, which is the largest producer of fed beef, has the largest absolute gain. Cow-calf production would become more concentrated in the western regions of the United States. This

is due to their use of cheaper hay and grass for feed compared to corn in other regions.

Nationally, net returns to livestock producers would increase by 16 percent. The effects across the country are mixed. Returns would fall in the Southeast and Pacific, and increase in the Delta states and Southern Plains. Gross returns from both crops and livestock would fall by 7 percent, variable expenses rise by 1 percent, and net returns fall by 18 percent. Much of this loss is due to the elimination of government payments with trade liberalization. The results derived reflect conditions in 1986, when a large part of farm income was derived from farm programs. For other years the numbers might be quite different. However, in general the mix of crop and livestock enterprises in a region will influence how it fares under liberalization. Since crop values would decline and livestock values increase, regions with a greater proportion of revenue from livestock enterprises would fare better.

## Implications for Non-Industrial Countries

Agricultural trade liberalization in industrial countries would affect both developing countries and the centrally planned economies. These countries may also participate in liberalization by reforming their own domestic agricultural policies.

### Developing Countries

The principal international trade model used in the preparation of this report does not include a number of commodities important to developing countries (coffee, cocoa, rubber, vegetables and fruits). The model is only able to provide results for part of the agricultural output of developing countries. Three regional breakdowns are considered: developing exporters, Asian importers, and other importers. The commodity coverage is roughly 50 to 75 percent of the value of agricultural exports for the developing exporters, 40 to 60 percent of imports for the Asian importers, and 30 to 70 percent for other importers. In general, developing exporters tax livestock producers and subsidize grain producers. Asian importers strongly subsidize grain producers. Other developing importers tend to tax agricultural producers and subsidize consumers. Within each group there is considerable diversity of policies and differences in support levels.

If the industrial countries were to liberalize their trade, the world prices of most agricultural commodities would increase. Because of developing country policies only part of the increase would be reflected domestically. Many developing countries insulate their domestic markets from changes in world market prices. Nevertheless, production in all three groups of developing

countries would increase. Exporters gain from expanded exports, while importers lose from the higher cost of food imports. On balance, the net export earnings of the developing countries would increase.

Developing country exporters and Asian importers would expand their agricultural trade, while other importers would contract their imports. Argentina and Brazil increase exports of cereals, ruminant and non-ruminant meats, and sugar. Indonesia, Thailand, and the Philippines expand exports of rice. Thailand also gains from sugar exports and Malaysia from vegetable oils. The Asian developing importers would increase their foreign purchases modestly (under 10 percent) especially of cereals, oilseeds and products, cotton, and sugar. The remaining importers would change from net importers to net exporters of rice as India, South and Southeast Asia, in particular, experience export gains. Central America and the Caribbean and Mexico would profit from increases in sugar exports. In contrast, Middle Eastern countries would experience a rise in import costs, mainly in dairy products and cereals. Since the vast majority of developing countries are net importers of food products, the higher prices from liberalization would lead to a small reduction in their real income.

If both industrial and developing countries were to liberalize, the increase in world prices would be somewhat lower. The removal of producer taxes and consumer subsidies in developing countries leads to lower demand and higher supply. Developing country agricultural production would again increase — by about 2 percent. Developing exporters would experience the largest gains. Not only would the value of production rise due to higher world prices but the quantity of agricultural production would expand as producers respond to higher world prices and lower export taxes. Most of the gains occur in the livestock sector. The producers in the Asian developing importers' region would benefit from higher world prices, but this would be more than offset by the decrease in agricultural support, hence, agricultural production would fall. The key differences in global versus IME liberalization would be the added growth in beef exports from the Latin developing exporters, additional growth in rice exports by the Asian exporters (especially India and Pakistan), and growth in rice imports by the Asian importers.

The implications of trade liberalization for developing countries are more complicated than can be determined by the model available to us. A review of the results obtained from other models indicates that most developing countries are likely to be net gainers from liberalization if tropical and other products are included. Increased export revenues from these commodities are large enough to offset the increased cost of grains. In general, the welfare gains to producers tend to offset losses to consumers, leading to an overall increase in national economic welfare. A broadly based liberalization of international agricultural trade is in the interest of developing countries. Nevertheless, some countries are likely to face substantial short-run adjustments with liberalization. Domestic and international

actions may be needed to help to facilitate this adjustment. Not all countries have agricultural products to sell in order to offset the increased cost of food. For these countries, liberalization of trade in other products, such as shoes, textiles and other manufactured goods, is likely to be a key factor if they are to reap the benefits of freer trade. Agricultural imports are limited by the availability of foreign exchange in most developing countries. The relaxation of the foreign exchange constraint is a critical requirement for food imports by developing countries.

## Centrally Planned Countries

Many of the centrally planned economies (CPEs) are net food importers. Agriculture is an important part of the economy in these countries. Although the agricultural sector in China has experienced rapid growth in recent years, growth has fallen in Eastern Europe and the Soviet Union. Growing domestic demand for food has placed increased pressure on agriculture, and has contributed to import demand. Access to cheap credit in some countries during the late 1970s led to a rapid increase in agricultural imports, particularly in Eastern Europe. Imports peaked in 1981 at $31 billion before the balance of payments problems of the 1980s caused East European countries to reduce their purchases of food overseas.

The need for hard currency is a major force driving the trade policies of centrally planned countries. Administrative control is significant and the agricultural sector is largely insulated from international markets. Prices, taxes, and exchange rates have a limited impact on the allocation of resources in these countries. Comparative advantage does not play a major role in determining the structure and level of production and trade. Only four CPEs are members of GATT (Czechoslovakia, Hungary, Poland, and Romania). Even if they are active participants in the agricultural negotiations, the CPEs are unlikely to contribute greatly to the effects of liberalization on world markets. They will be affected mainly by the reforms undertaken by industrial countries.

On the import side, the impact of liberalization will depend largely on the degree to which CPEs are able to manage their debt problems. Foreign exchange constraints are the most import factor determining imports. On the export side, the impact of liberalization will depend on the extent to which the CPEs are willing to allow changes in world prices to be reflected in domestic producer prices. Among the East European countries the largest gainers from liberalization are likely to be Hungary and Poland, with a more than $0.5 billion increase in foreign exchange earnings. China would gain from the increase in rice prices but would lose from higher prices for imported grains, particularly wheat. The Soviet Union would probably lose more than $1 billion because of higher grain prices. Overall, the centrally planned economies could experience a small real income loss of about $1 billion from industrial market economy liberalization.

## Economy-Wide Effects

The models which have been used so far in this report generate a substantial amount of information on the probable impact of agricultural trade liberalization. However, they do not take into account the implications of the linkages between agriculture and the rest of the economy. Models which reflect the complex interrelationships between the agricultural and nonagricultural sectors are still in the developmental stage. Most of the models relate to a single country, and differ considerably in their structure and assumptions. Models for several countries were examined in order to evaluate the broader economic impacts of liberalization.

### United States

The reform of agricultural policies would affect the rest of the U.S. economy through changes in: (1) prices and supplies of agricultural products, (2) the returns to labor and capital in farming, (3) the demand for intermediate goods, (4) the use of factors in agriculture, (5) the balance of trade, and (6) the government deficit, domestic savings, and investment. The first four of these reflect market adjustments to changes in incentives. The last two are macroeconomic factors which affect the structure of aggregate demand. The impact of liberalization on national income depends on how easily factors are able to relocate and what the government does with the savings from reduced agricultural support expenditures.

Government savings could be used to reduce the budget deficit and increase domestic investment; they could be used to make transfers to farm households or to other households in the economy; or they could be used to pay foreign debt and improve the balance of payments. Factor mobility, particularly labor mobility, is crucial in determining the impact of these alternatives. If the factors employed in agriculture, particularly labor, are able to move to higher productivity industries, and if government savings are used to stimulate domestic investment, gains in national income of between $3 and $4 billion would result from unilateral liberalization. If factors do not move out of agriculture, the economy would lose between $2 to $5 billion. At best, when all factors are mobile and the savings of government expenditure are used to reduce the balance of trade deficit, the economy would gain roughly $4 billion in real gross national product. This amounts to $12,400 for each worker who must change jobs. Multilateral liberalization results in an increase of $3 billion in national income.

A robust result from our analysis is that the economy-wide gains from agricultural policy liberalization arise primarily from the reallocation of labor from agriculture to other sectors. How fast and to what extent labor can adjust to liberalization is of critical importance for the economy as a whole. Factor mobility is a key issue in determining the adjustment implications of liberalization and the gains that would be realized from freer trade.

## Australia

Australia is different from a number of other industrial countries in having a heavily protected industrial sector. In 1985-86 the effective rate of assistance was 19 percent in manufacturing compared to 12 percent for agriculture. These averages hide considerable disparity within sectors. For example, within agriculture, effective rates vary from -11 percent for pigs to 159 percent for dairy. Such disparities create economic efficiency losses. Industries with high effective rates of assistance are able to attract resources away from more efficient industries.

Analysis based upon a model of the Australian economy indicates that with unilateral liberalization of agricultural policies national income would actually decline slightly (by 0.4 percent). The removal of government support for agriculture results in a contraction in agricultural output. This is not offset by an expansion elsewhere in the economy. Since agriculture is a significant export sector, total exports decline. An important condition for liberalization in agriculture in Australia is a corresponding liberalization in manufacturing. Manufacturing protection imposes significant costs on agriculture. If this protection were eliminated, agricultural output would increase by 3 percent, and national income would increase by roughly 1 percent.

The largest gains to Australian economy would occur if both agriculture and manufacturing policies were liberalized. While national income would only increase marginally (0.3 percent), there would be gains in aggregate employment and in the net revenue position of the government. International competitiveness would improve and both exports and imports would expand. The main losers from liberalization would be the highly protected manufacturing industries — textiles, clothing and footwear, and motor vehicles — and the highly protected agricultural industries — dairy, eggs, and some fruits.

Multilateral liberalization of grains and livestock markets would increase national income by roughly 1 percent. Agricultural output would increase by 6 percent. The extensive livestock (beef and sheep) and grain industries would benefit most, followed by the intensive livestock industries (dairy, pigs and poultry). Output of the meat products and agricultural machinery industries would rise substantially.

## Canada, the European Community, and Japan

The models used to analyze these three countries are similar in structure. They contain substantial detail on the agricultural sector, but less detail on the nonagricultural sector. Agriculture is linked to the rest of the economy through the demand for labor and capital. The models assume that capital employed in the agricultural sector is not able to move to nonagricultural sectors. Its mobility within agriculture is also constrained.

The results derived from the models are qualitatively similar to those for the United States and Australia. The effect of liberalization on national income is generally positive, but small. After all adjustments have taken place, national income in Japan and the European Community increases by 0.4 and 0.3 percent, respectively. In Canada, national income remains almost unchanged. The effects of liberalization are most dramatic for the use of labor and capital and their prices. Trade liberalization leads to a contraction of the agricultural sectors of Japan and the Community. Labor use in agriculture falls by 7 percent in Japan and 15 percent in the Community. Liberalization slows the rate of out-migration of labor from Canadian agriculture. Agricultural land prices in both Japan and the European Community would fall sharply.

The substantial changes which are likely to take place in employment and factor prices in Japan and the European Community suggest that measures may have to be taken to help facilitate agricultural adjustment if existing policies are changed. Trade liberalization could result in substantial reductions in the value of agricultural assets, particularly land. The rate at which factors displaced by trade liberalization can move into other productive activities is a key determinant of the benefits for the economy as a whole.

## Limitations of the Analysis

The models used in preparing this report require an enormous quantity of information. Numerous assumptions have to be made about the behavior of markets and the effects of policies. We are often forced to work with incomplete, dated or imperfect information. As a result, the models we have used vary in terms of their structure, time period, and level of detail. These models are similar in structure to others used to analyze the effects of liberalization, although the quantitative estimates we have derived may differ from earlier studies. A major source of variation is the level of government support which changes yearly with world prices. The models provide important insight into the probable effects of liberalization but they do not capture all its aspects.

We have not been able to analyze fully the implications of trade liberalization for market stability. The stability of trade and prices as well as their average levels would be affected by trade liberalization. Analysis indicates that in the longer-term, international markets are likely to become more stable with trade liberalization. The size of the effect is crucially dependent on what changes are made in existing policies and over what time period. The phasing of policy reform could be critical, particularly for the release of surplus stocks.

Our models do not capture fully the long-term effects of liberalization on economic efficiency. The gains we have estimated are primarily medium-term

gains, the longer-run effects could be greater. The question of the rate and extent to which factors of production move between alternative economic activities is critical in determining the long-run gains from liberalization. Some of our models reflect, at least partially, the dynamic efficiency gains from liberalization, but they probably do not capture the full effects.

Recent work in the economics literature has argued that several important factors in international markets are the potential for countries to exercise market power, the influence of special interest groups (rent seekers) who stand to gain from trade policy, and the consequences of economies of scale. Market power is prevalent in international agricultural markets, and economies of scale are potentially relevant, especially in marketing, distribution and processing. The relevance of special interest groups and imperfect competition are well recognized among agricultural policy analysts. The implications of these factors for trade liberalization have yet to be assessed fully. They are not reflected in our models.

The utility of our models depends upon the validity of their empirical assumptions. There are a number of problems including: (1) the accurate estimation of cross-commodity linkages, (2) incorporating the effects of specific policy interventions, (3) rigidities in trade flow patterns, and (4) the adequacy of our models to determine the effects of large changes, such as the total elimination of existing policies. These issues raise a challenge for the practitioners of modeling, but many are of little interest to the users of the results. However, users need to be aware of the limitations of the models. We can provide useful indicators of the likely effects of changes in policies, but our indicators should not be treated with pin-point accuracy. Our models only allow us to draw qualitative conclusions on the probable effects of liberalization.

# Conclusions

- This report has used a series of economic models, the results from previous studies, and the evaluations of knowledgeable individuals to assess the implications of agricultural trade liberalization. Our models sometimes yield quantitatively different results to earlier studies, reflecting differences in base years and assumptions. Nevertheless, the qualitative conclusions are similar.
- Trade liberalization would lead to moderate increases in world prices and trade volumes for most agricultural commodities. The size of the increase is more or less in proportion to the protection which government policies provide from international competition. Earlier in the decade, livestock and dairy products, and sugar were subject to the greatest policy distortions. Recently, distortions have increased substantially for cereals. Relaxing these distortions would have a world price effect comparable to that for livestock, dairy and sugar.
- The long-term trend in world prices is downward despite short-term fluctuations due to weather conditions and other factors. Technological change continues to expand supply faster than the increase in world demand. The rise in prices from trade liberalization would help to offset the downward trend but would not prevent it. The price changes brought about by liberalization would be small relative to the normal variability in world markets.
- Taxpayers and consumers would gain substantially from trade liberalization through lower government expenditures and lower food prices. If no measures are taken to compensate producers they would lose in many countries, including the United States. Producers in less-distorting countries (e.g., New Zealand), would gain from liberalization.
- Unilateral liberalization would lead to larger benefits than multilateral liberalization for most countries but would impose substantial costs on producers. Multilateral liberalization is less disruptive domestically. There is a major incentive for countries to cooperate in reforming domestic agricultural polices in order to minimize domestic adjustments from freer trade.
- Freer trade would have different regional effects within countries. The competitive position of livestock farmers improves. Regions which specialize in livestock production tend to benefit more or lose less from liberalization. In the United States, for example, the Plains and western states tend to fare best with trade liberalization because their comparative advantage is in beef production.

- Agricultural trade liberalization would have a modest effect on national incomes in industrial countries. Agriculture is a small part of the economy in most countries. Income gains are likely to be larger in the longer term if the distortions created by agricultural policies are eliminated. Liberalization of the non-agricultural sectors would be important in some countries, for example, Australia. It is also significant for developing countries.
- Liberalization would have significant implications for resource use and factor prices. The price of factors employed in agriculture, particularly land, could change substantially. Losses would be incurred by some agriculturally related industries such as input supply or processing firms. Factor mobility is the key to the adjustment process and to how trade liberalization would unfold over time. The degree to which agricultural labor and capital is able to move to more productive employment under freer trade is critical. The extent of factor mobility is not well understood, particularly in the longer term. Further work on adjustment needs to be done for critical crop and livestock enterprises.
- Trade liberalization would probably lead to more stable world prices, alleviating the need for domestic stabilization programs. The quantitative impact of this effect is uncertain, especially if full liberalization is not achieved. Most agricultural programs combine stabilization with producer support. If support were reduced but policy institutions remained roughly the same, domestic stability would continue to be achieved at the cost of world instability.
- Whether developing countries would gain or lose from trade liberalization depends on whether they are agricultural exporters or importers. Liberalization may improve the trade balance for importers — at higher prices they can produce more and import less — but not necessarily their net income. The gains from liberalization would be greater if all agricultural commodities are liberalized, and if developing countries also participate in the reform of domestic policies. Centrally planned countries would probably experience a slight income loss if industrial countries liberalize.
- Trade liberalization would generally result in net gains to the countries who liberalize. Taxpayers and consumers could afford to compensate producers and others in the agricultural sector for their losses and still be better off. Society's long-term gains would be sufficient to pay for the short-run adjustment costs of liberalization borne by particular groups of individuals. Nations could also afford to support the incomes of their agricultural producers if their support programs allowed the benefits from freer trade to be realized. The challenge is to find alternatives to current policies that will achieve this.