The world sugar market has long been characterized by volatile prices and widespread intervention. Controls on domestic prices, demand, and supply have created an inefficient pattern of world production, consumption, and trade. Without government controls, production would shift from the countries with higher-cost, subsidized production (especially the European Community, Japan, and the United States) to the countries with lower costs (such as Australia, Brazil, and Thailand). The resources saved could then be directed to other activities.

Sugar policies in countries with high costs reduce world sugar prices quite substantially in the long run and increase price variability significantly; production controls in countries with low costs increase world prices somewhat and also increase their variability.

What would happen if all interventions ceased? Average world sugar prices would probably—but not definitely—rise. World prices would definitely vary less, and economic conditions would definitely improve, especially in developing countries that depend heavily on sugar exports. But the prospects for substantial reform of the sugar market are not promising, even though the GATT Uruguay Round continues. This article puts forward some modest proposals for changing the existing interventions to lessen economic distortions and reduce costs.

Volatility in world agricultural commodity markets compels farmers to demand political action to remedy the problems caused by price instability. Consumers and taxpayers may also respond politically to unstable prices, although their incentives differ from those of farmers and may...
be weaker. The uneven political pressures from the different groups usually result in market interventions that favor farmers.

The volatile prices and widespread government intervention characteristic of the world sugar market have shown up in a pattern of short, sharp price peaks and extended price troughs. To insulate themselves from the world market, producers in most countries have lobbied their governments to control domestic prices, supply, and demand. Numerous price, production, trade, and stockholding policies have been devised. Ultimately, detachment from the free market greatly distorts production, consumption, trade, and world prices. Under a more liberal trading order, production would shift from countries where sugar production is subsidized and costs are high (such as the European Community, Japan, and the United States) to countries where costs are low (such as Australia, Brazil, and Thailand). The world's sugar requirements would be met with fewer resources, and the resources saved could be transferred to other industries to generate additional income. Consumers currently paying high domestic sugar prices would be able to buy more agricultural and other goods and thus have higher real incomes. Such changes would benefit many small, low-income developing countries that have been hurt by the existing policies.

The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) multilateral trade negotiations opened an avenue for agricultural trade liberalization. But many special interest groups stand in the way of trade reforms. Long-lasting and effective reforms will not be achieved easily. To ensure durable reforms, governments must alter the incentives that affect the formation of policy. Understanding the process that spawns and sustains interventionist trade policies in particular markets will help in assessing the viability of various trade reforms in the long term.

To provide a framework for assessing the prospects for trade reform in the sugar market, this article begins by explaining the main features of policy formation in that market. Some of the key features of existing policies are discussed, and the findings of a number of empirical studies are highlighted to draw attention to the economic costs and benefits of intervention. The discussion draws heavily on a model of the world market developed by Wong, Sturgiss, and Borrell (1989), and indeed some parts of the article summarize that work directly.

The World Sugar Market

In June 1985 the world market price slumped to a historic low of $0.06 per kilogram.¹ A decade earlier, in the boom year of 1974, sugar had sold for a brief period at around $2.60 per kilogram (in 1985 values) and averaged $1.30 per kilogram for the year. The average price over the past thirty-five years (in 1985 values) has been $0.35 per kilogram, and the average cost of production worldwide is estimated at $0.44 per kilogram. The price instability in the world
The sugar market has caused virtually all countries—even exporting countries with low production costs—to insulate their domestic producers from low prices. This protection has both compensated for and sustained the long-term excess of costs over export returns.

Among sugar-producing countries, those most exposed to the world market are those that export a large share of production, such as Australia and Thailand. Cuba, although a large exporter, has reduced its exposure through a bilateral trade agreement with the former U.S.S.R. The producers that are least exposed are those with large domestic markets. In these countries, consumers and taxpayers subsidize producers who receive a high and stable domestic price. The most notable examples in this category are the United States, the European Community, Japan, the former U.S.S.R., India, and China.

The sugar policies of major industrial countries have attracted much attention because of the magnitude of support offered to producers and the governments' seeming disregard for the high costs incurred. The stated goal of the policies is usually to stabilize and maintain farm incomes. In some cases, notably in Europe and Japan, self-sufficiency has been a consideration. Intervention is also widespread in both producing and consuming developing countries, where a primary aim of policy is to earn (or conserve) foreign exchange.

To achieve their goals, governments may control supply, both in domestic production and trade, or operate a stockpiling policy. Controls on supply allow producer prices in the European Community, Japan, and the United States to be very high relative to the world price (Wong, Sturgiss, and Borrell 1989). In Japan the producer price in 1986 was eleven times the world price. These domestic prices are not only higher than the world price but also more stable. In all cases, producers are protected in times of declining world prices. The United States is notable for insulating producers from world price troughs but not from peaks, suggesting that support of producers' incomes is a higher priority than stabilization of prices.

When restrictions are placed on domestic production, as in Australia and the European Community, controlled expansions of the domestic industry occur but contractions do not, even in times of very low prices. The policies, which were designed in part to protect producers from price instability, have actually exacerbated world price fluctuations, partly because increases in supply have not been well synchronized with the rather stable growth in demand. Governments change production controls only after world price peaks, and then in large steps. The resulting surges in world supply have far exceeded increases in consumption. When world prices fall due to a surge in production, protective policies are activated to support the expanded industries and new fixed investments, depressing world prices for some years. In addition, because of the insulation of many domestic markets, the burden of adjustment is borne by the relatively small, unprotected world trade sector. To induce the necessary adjustments of supply and demand, the world price must vary more than would otherwise be required.
Economic Effects of Policy Intervention

Under a trading system with less market intervention, producers would respond directly to the world price and would likely base their production plans on anticipated growth in consumption and on changing market conditions. Severe shortages of sugar and the high prices that follow would then be less likely to occur, as would overexpansion and periods of drastically low prices; the price would become less variable.

Whether the average world price level would be higher or lower in the absence of intervention is hard to predict. The average world price could increase because producers with high costs would lack the support prices needed to expand. The removal of supply controls in the countries with low costs, however, might make it profitable for efficient producers to supply the world market at a lower price. What is more certain is that there would be a shift in production away from countries with subsidies and high costs toward those with low costs. Efficient producers would gain from greater trade opportunities. Consumers and taxpayers in importing countries would also be better off because the world's sugar would ultimately be produced with fewer resources. Prices paid by consumers would be lowered overall and subsidies paid by taxpayers would be reduced or eliminated.

The Policy Formation Process

Intervention in the world sugar market began more than 300 years ago, when European countries strictly regulated the trade in sugar to facilitate taxation of sugar-producing colonies (Ballinger 1971). The colonies were forced to sell exclusively to their respective mother countries (or to other colonies) and to pay large duties. These duties increased the landed price of sugar, thereby providing more incentive to produce sugar (especially from sugar beets) in Europe and North America. These sugar industries grew up heavily dependent on the artificially high price, and thus with a strong interest in continuing this intervention.

With few exceptions, groups whose welfare is directly affected by government intervention seek to influence policies in their favor. In the countries with high costs, producers have backed policies that consistently favor them at the expense of consumers, taxpayers, and producers in other countries. In the European Community, Japan, and the United States, for example, government subsidies in recent years have made up more than half the income of a sugar farmer or sweetener producer. These costs, unless they are budget items, are usually not transparent to consumers, taxpayers, or voters.

The amount that firms or individuals stand to gain from policy interventions determines their incentive to form "distributional coalitions" (Olsen 1982) to lobby the government. Those who pay the costs of the support policies—consumers and taxpayers, for example—have, as a group, a strong incentive to
press for reforms. For individuals, however, the incentives are weak because the cost of the policies to individuals, even when clearly perceived, tends to be small. Additionally, the cost of forming a strong lobby from a diverse and numerous group such as sugar consumers is usually quite large in comparison with the benefits to be obtained from policy reform.

Producers, however, may have strong incentives to form coalitions. Sugar farmers and processors have a great deal of fixed capital tied up in production and a vested interest in maintaining support. In 1984–85, for example, the six large companies that own all the mills and farms in Florida received total support estimated at $329 million (in 1984 dollar values) (Borrell, Sturgiss, and Wong 1987). In the same period, the estimated cost of the sugar policy to a U.S. family of four was about $55. When the benefits of an existing policy are enjoyed by relatively few while the costs exceed the benefits but are borne by many, the political will to reform is not strong.

The variability of world market prices seems to help producer groups increase the total level of support they receive. When the world price rises, producers seek increases in either production quotas, producer prices, or investment subsidies. At the same time, if security of supply and conservation of foreign reserves are government objectives, high prices in the world market may lead governments to encourage expansion of domestic production, even if it is not profitable for the economy as a whole. When the world price falls due to a surge in production, producers seek protection of the value of their fixed investments. In spite of the rising financial and economic costs, it can be politically difficult to reduce protection, particularly for a government that has encouraged the previous expansion. High levels of protection are thus given to enlarged industries, lengthening the period of excessive production and depressed prices. It is usually only after a long period of depressed prices, if at all, that some action is taken to decrease levels of support. Indeed, the expectation of protection against low prices may encourage producers to overexpand when given the opportunity to increase production.

Empirical Evidence of the Effects of Intervention

Protectionist agricultural policies have so distorted world markets that it is difficult to determine what form these markets might assume under more liberal trading practices. Nonetheless, studies of policies in various countries cast some light on the consequences of intervention and the effectiveness of policy reform. Market interventions have affected both the level and the variability of world sugar prices. Although the combined effect of all countries' policies is open to some question, there is little doubt that the policies of the United States, the European Community, and Japan have, separately and jointly, significantly depressed world sugar prices. At the same time, they have ensured a sustained misallocation of resources in the production and consumption of
sweeteners worldwide, imposing high costs on their own economies and on those of efficient exporting countries as well.

**The United States**

The principal feature of U.S. sweetener policy has been the level of protection offered not only to sugar producers but also to producers of high-fructose corn syrup. The target domestic price, termed the market stabilization price, is supported by import controls where the import quota is based on the chosen stabilization price and the expected domestic supply and demand. When the world price exceeds the stabilization price, import quotas are not binding and the domestic price follows the world price. As a result of this price support policy, consumption and imports of sugar have declined. The United States, formerly the largest importer of sugar with annual imports of 5.5 million tons (20 percent of world imports), now imports only 1–2 million tons annually.

A key reason for the fall of U.S. sugar consumption and imports is the development of alternative sweeteners, including high-fructose corn syrup and low-calorie sweeteners such as aspartame. Corn syrup has many of the attributes of sugar and can be readily substituted for it in many uses—for example, in soft drinks. In the United States, corn syrup production costs are low relative to the protected sugar price, enabling corn syrup producers to undercut the sugar price and rapidly expand their share of the caloric sweetener market. Domestic production is not limited by quota, and by 1985, corn syrup had almost completely substituted for sugar in applications where substitution was relatively easy. Sugar's share of the total U.S. sweetener market fell from 79 percent in 1970 to 41 percent in 1988.

Domestic sugar production, including both beets and cane, has increased rapidly in recent years, from just under 5.5 million tons in 1985–86 to 6.7 million tons in 1987–88. This increase has come mainly from farmers switching production from wheat to sugar beet in response to declining returns from wheat relative to sugar. In the 1980s the sugar support price was also more stable than in the previous decade and was announced up to four years in advance. The greater certainty of sugar returns has increased the relative attractiveness of beet production.

The reduction in U.S. sugar imports greatly depressed world sugar prices in the 1980s. Sudaryanto (1987) estimated that in 1982–83, U.S. sugar policies depressed the world price by 49 percent. Borrell, Sturgiss, and Wong (1987) estimated that in 1982–86, world prices were 34–50 percent lower due to U.S. policies, and for a twenty-year period, world prices were 9 percent lower on average. More recently, Sturgiss, Field, and Young (1990) have estimated that the U.S. sugar policy depressed the world price by 21–33 percent on average from 1982 to 1988, although for some years the estimated reduction was as high as 48 percent.
The work of Borrell, Sturgiss, and Wong and of Sturgiss, Field, and Young suggests that the effect of U.S. policy is particularly severe during cyclical periods of low world prices, because it is then that the gap between U.S. and world prices is greatest. Borrell, Sturgiss, and Wong estimated that U.S. policy increases world price instability by 8.0–12.5 percent (with instability measured as the coefficient of variation of prices). Moreover, the policy increases the chance of both very low and very high prices.

There are at least two reasons why U.S. policy has had such a big impact. First, the increases in domestic production of both high-fructose corn syrup and sugar had displaced an estimated 68–82 percent of imported sugar by 1988 (Sturgiss, Field, and Young 1990). Second, consumers and producers elsewhere in the world are mostly unresponsive to changes in the world price. Changes in the world price cause only small changes in the world supply of and demand for sugar, so relatively large price declines are required before other markets absorb the imports displaced from the United States. With so little adjustment in production and consumption, falling prices generally induce increased stockholding.

U.S. policy provides compensation to some sugar exporters in the form of restricted access to the high-priced U.S. market. For most exporting countries, however, access to the U.S. market has been insufficient to compensate for the export revenue lost because of low world prices. Table 1 indicates the estimated cost or benefit of the policy to exporters in selected years. For Australia, Brazil, the European Community, Fiji, and Thailand, U.S. policy imposed hefty costs, at least between 1982 and 1988.

Table 1. Income Transfers to Trading Partners Resulting from U.S. Sugar Policies, Selected Years, 1982–88

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A^a</td>
<td>B^b</td>
<td>A^a</td>
<td>B^b</td>
</tr>
<tr>
<td>Argentina</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>-7</td>
<td>-34</td>
<td>-76</td>
<td>-194</td>
</tr>
<tr>
<td>Brazil</td>
<td>20</td>
<td>-3</td>
<td>-16</td>
<td>-134</td>
</tr>
<tr>
<td>Caribbean Basin countries</td>
<td></td>
<td></td>
<td>198</td>
<td>111</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td></td>
<td></td>
<td>120</td>
<td>84</td>
</tr>
<tr>
<td>European Community</td>
<td>-34</td>
<td>-62</td>
<td>-167</td>
<td>-320</td>
</tr>
<tr>
<td>Fiji</td>
<td></td>
<td></td>
<td>2</td>
<td>-4</td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td></td>
<td>83</td>
<td>48</td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
<td>-54</td>
<td>-110</td>
</tr>
</tbody>
</table>

Note: Not available.

a. U.S. supply of high-fructose corn syrup is assumed independent of sweetener prices.

b. U.S. production of high-fructose corn syrup is held constant at its 1981 level.

Source: Sturgiss, Field, and Young 1990.
For the Caribbean countries, access to the U.S. market is considered a form of aid under the U.S.–Caribbean Basin Initiative. Although the benefit was sizable through the mid-1980s, it has since declined as the region’s import quota has fallen. Indeed, in 1988 U.S. policy imposed a net cost on the region. Considering that the estimates given in table 1 exclude the cost of resource misallocations arising from trade distortion, the total costs are likely to be greater than reported. When exposure to foreign competition is reduced, as in those exporting countries with large U.S. import quotas, domestic industries tend to become uncompetitive and to resist the changes adopted in other countries (Kindleberger 1973).

Faced with quota reductions in the last decade, areas that once produced sugar for the U.S. market have abandoned production because they are unable to compete on the depressed world market. Sturgiss, Field, and Young (1990) report that annual exports from the Caribbean fell by 0.6 million tons over the period 1983–88, resulting in an annual revenue loss of $340 million by 1988. When this consequence of U.S policy is taken into account, the costs to the region may have outweighed the benefits as early as 1986. Ives and Hurley (1988), in a detailed analysis of the effects of the U.S. sugar program on the Caribbean countries, conclude that it has imposed great hardship. Unemployment has soared, and because the sugar industry is the region’s largest employer, the U.S. sugar program is often blamed.

The U.S. policy may similarly impose net costs on Argentina and the Philippines when the wider economic effects are considered. As in the Caribbean countries, both total exports and exports to the unprotected world market from the Philippines declined during the 1980s. The country was highly dependent on access to the U.S. market in the early 1980s, and when its import quota was reduced, the Philippines was unable to export to the world market. In contrast, Fiji, Malawi, Swaziland, Thailand, and Zimbabwe were given very limited access to the U.S. market. Highly dependent on the free world market, these countries had to keep production costs low to remain competitive. Despite depressed world prices, these countries increased their exports during the 1980s.

Although U.S. policy has been costly for exporting countries, it has imposed even greater costs on the U.S. economy. Estimates of the income transfers and costs to U.S. groups are given in table 2. Between 1982 and 1988, the costs to U.S. consumers and stockholders exceeded the transfers to U.S. manufacturers of sugar and high-fructose corn syrup and to the government by an estimated $776–785 million annually. The cost varied with changes in the world price and was highest in 1982—in excess of $1 billion. The annual subsidy equivalent given to sugar producers and high-fructose corn syrup producers is on the order of $1 billion each between 1982 and 1988. The estimated costs imposed on consumers over the same period are on the order of $2.5 billion annually. Costs and transfers of a similar order of magnitude have been estimated in several
Table 2. Estimated Annual Income Transfers and Costs to U.S. Groups Resulting from U.S. Sugar Policies, 1982–88
(millions of 1988 dollars)

<table>
<thead>
<tr>
<th>Crop year</th>
<th>Transfer to sugar producers</th>
<th>Transfer to corn syrup producers</th>
<th>Cost to consumers</th>
<th>Transfer to stockholders</th>
<th>Net loss to U.S. economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982–85 (average)</td>
<td>1,164–1,304</td>
<td>739–1,035</td>
<td>2,959–3,362</td>
<td>95</td>
<td>57–42</td>
</tr>
<tr>
<td>1986</td>
<td>1,299–1,502</td>
<td>1,014–1,645</td>
<td>3,506–4,197</td>
<td>9</td>
<td>48–13</td>
</tr>
<tr>
<td>1987</td>
<td>716–1,124</td>
<td>548–1,237</td>
<td>1,853–3,042</td>
<td>8</td>
<td>50–43</td>
</tr>
<tr>
<td>1988</td>
<td>558–1,019</td>
<td>394–1,044</td>
<td>1,327–2,538</td>
<td>6</td>
<td>34–30</td>
</tr>
<tr>
<td>1982–88 (average)</td>
<td>904–1,108</td>
<td>614–1,008</td>
<td>2,315–2,903</td>
<td>51</td>
<td>45–43</td>
</tr>
</tbody>
</table>

Note: Transfers may not cancel due to rounding.

a. September–August.

b. The first-mentioned figure in the range is derived when the U.S. supply of high-fructose corn syrup is held constant at its 1981 level. The second figure is derived by assuming that U.S. production of high-fructose corn syrup is independent of sweetener prices.

Source: Sturgiss, Field, and Young 1990.
other studies of U.S. sugar policy. (For a review of estimates from partial equilibrium studies on the U.S. sugar program, see Rendleman and Hertel 1989.)

The net losses to the U.S. economy include both efficiency losses and losses arising from the transfer of income from U.S. consumers to foreign suppliers of sugar (quota holders). U.S. sugar policy encourages industry to use resources in the production of sweeteners at a cost higher than the international value of such products, and the United States pays more for its sweetener imports than their international value. Because the policy confers benefits on some countries, such as cheaper sugar imports for China, Japan, and the former U.S.S.R., the net losses to the world economy are less than those to the U.S. economy itself. For the period 1982–88, the loss to the world economy is estimated to have averaged between $300 million and $500 million (Sturgiss, Field, and Young 1990). There are many reasons for believing this is a conservative estimate; in particular, the impact of the policy on other sectors was not included. Rendleman and Hertel (1989) estimated the effects of the sugar program on seventeen other producing sectors and concluded that the gains to the U.S. economy from free trade in sugar could be as much as double the estimates of most other studies.

The European Community

The support provided to the European Community’s (EC’s) beet sugar industry under the Common Agricultural Policy transformed the Community from a net importer of sugar in the early 1970s into a large exporter with net exports of 4 million tons in 1983. Domestic prices are maintained at levels well above the world price, although the amount of production receiving the supported price is limited by quotas. The only imports are those that enter under the Lome Agreement, which allows certain African, Caribbean, and Pacific Island countries to export around 1.4 million tons of raw sugar annually to the high-priced EC market. These imports are subject to a system of variable levies, and the allowable level of imports has remained virtually unchanged since 1975.

The established domestic price serves as a price floor, since intervention agencies are required to purchase any sugar offered to them (up to the production quota) at this price. In 1988–89 the intervention price was 0.54 ECU per kilogram for refined sugar and 0.45 ECU per kilogram for raw sugar (while the world raw sugar price—cost, insurance, and freight to Rotterdam—was around 0.22 ECU per kilogram). In fact, producers do not usually receive the full intervention price because their receipts are taxed. These taxes offset the losses incurred by the European Community on sugar exports when (as is generally the case) the world price is lower than the supported domestic price that traders must pay. The Community pays an export “restitution” to traders to cover the difference. The beet producer price is also regulated, with a minimum price set on the basis of the sugar intervention price. This “intervention beet
price" is reduced in proportion to any levies paid by the sugar producers, and the reduction is significant for beets used in B-quota sugar production.

Sugar production is divided into three categories: A, B, and C. The first two are limited by production quotas and receive supported prices; production of the third is unlimited but must be sold at the world price. When quotas are binding, a "co-responsibility" levy of 2 percent is placed on both A and B sugar. If the funds from the co-responsibility levy do not cover the cost of export restitutions, an additional levy of either 30 percent or 37.5 percent is applied on B sugar. On occasions when this levy is still not enough, a further levy of 5 percent has been imposed on A sugar and the total levy on B sugar has been raised to around 50 percent. Even with these high taxes, however, the net price for B-quota sugar exceeds the world price by one-half of the difference between the intervention price and the world price.

The bulk of sugar produced is A-quota sugar, which receives nearly the full intervention price. Production of A-quota sugar for the nine-member Community in 1988-89 was 9.2 million tons (refined). The intervention price is high enough relative to costs to ensure that all A quotas are filled except when adverse weather or disease outbreaks make this impossible. The B quota is much smaller; in 1988-89 it was set at 2.2 million tons. Production quotas are allocated to individual countries and then to individual factories, and are nontransferable. Thus, shortfalls in quota production cannot be met by other factories or countries, and it is possible for the Community as a whole to produce B-quota sugar without having a full A quota, owing to production difficulties in particular localities.

Although C sugar must be sold on the world market without any government support, the support provided to A- and B-quota production can indirectly assist producers of C sugar. In some countries, the A, B, and C revenues are pooled (Bureau of Agricultural Economics 1985), allowing producers of C sugar to earn more than the world price for an unlimited quantity of sugar. Even in countries where this does not occur, the assistance given to produce A- and B-quota sugar covers the fixed costs of production, making it worthwhile to produce additional C sugar whenever the world price covers the marginal costs of C production. In some cases, C sugar may be produced only to ensure sufficient supplies to meet a grower's A and B quotas, and not because it is economical in itself.

To protect the market from imports, a threshold price is established and used to determine levies on imports. The threshold prices for raw and refined sugar in 1988-89 were 0.57 ECU and 0.66 ECU per kilogram, respectively. When the world price is lower than the threshold price, imports are subject to a levy equal to the difference between the world and threshold prices. The levy removes the incentive to import sugar. Conversely, import subsidies and export taxes (additional to the levies described above) are used when the world price is higher than the threshold price. This stabilizes the domestic market.
In essence, the effects of EC policy are to restrict imports, to raise domestic producer and consumer prices above the world price, and to raise production, lower consumption, and increase exports. Overall, the policy greatly adds to the structural surplus on the world market.

The long-term price-depressing effect of EC policy on the world market has been estimated at between 5 and 12 percent (Anderson and Tyers 1986; Bureau of Agricultural Economics 1985; Koester and Schmitz 1982). The Bureau of Agricultural Economics (1985) estimates that EC production is 1.3–2.3 million tons higher and exports are 1.6–2.5 million tons greater than they would be in the absence of price supports. The nature of intervention in the EC sugar market, however, distorts supply to such an extent that it is very difficult to model accurately how producers would respond if they were exposed to the world price. Nonetheless, because the intervention price is usually several multiples of the world price, it seems reasonable to assume that supply would be substantially reduced.

EC policies may have an even greater effect on the world market than indicated above. Using the model of Wong, Sturgiss, and Borrell (1989), simulations were conducted in which A- and B-quota production was reduced to a level equal to EC consumption. It was assumed that only C sugar was traded, and all export restitution payments ceased. Subsidies were assumed to be paid on the reduced A- and B-quota production. The underlying assumption was that in the absence of export restitutions, current producers of A- and B-quota sugar would not export to the world market, though producers of C sugar would and could increase their supply as world prices rose. This assumption does not seem unreasonable considering that the European Community became a net exporter only after support prices were raised and A and B quotas were increased to a level well above 100 percent self-sufficiency in 1975–76. Although changes in technology have increased productivity in the industry, it appears that the large boost in subsidies since 1975–76 is the principal factor sustaining the export of A- and B-quota sugar. The Bureau of Agricultural Economics (1985) concludes that the support arrangements enable production of substantial quantities in parts of the Community where cost structures would otherwise prevent such production.

The simulations based on Wong, Sturgiss, and Borrell indicate that the European Community’s export of A- and B-quota sugar to the world market alone has the potential to lower the world price by 17.5 percent on average, and by at least 30 percent during low points of the world price cycle. In addition to encouraging excess production and exports, the EC policy also depresses the world price because the consumer price is set above the world price, so that EC consumption is lowered as well. Taking this effect into account, Sudaryanto (1987) estimated that EC policies lowered the world price by 35 percent in 1982–83.

The effects on the economies of exporting countries can also be calculated. The annual average cost of the policy between 1982 and 1988 (in 1984 dollars)
is estimated at up to $160 million each for Australia and Brazil, up to $72 million for Thailand, up to $50 million each for the Philippines and South Africa, $23 million for the Dominican Republic, and $13 million each for Colombia and Guatemala. For most of the African, Caribbean, and Pacific States (ACP countries) with access to the EC market under the Lomé Convention, the net effect of the policy between 1982 and 1988, after allowing for the price-depressing effects on the world market, is estimated to be positive. The statistics are summarized in table 3. Among the larger exporters in this group, Mauritius clearly benefited from the policy, while for Zimbabwe, Swaziland, and Fiji the benefits have been considerably fewer—especially when measured on a unit export basis, as in table 4. More than 75 percent of Mauritian exports are allowed into the EC market; less than 33 percent of the exports of the other ACP countries are allowed.

Koester and Schmitz (1982) estimated the effects of EC sugar policy on the ACP countries for 1978–79 and also found wide disparities in the net benefits to recipient countries. They point out that although the preferential access granted to ACP countries is regarded as a form of economic aid, there is no correlation between the net benefit conferred and the gross domestic product of those countries. The effects on the economy are arbitrary and do not correspond to any obvious objective of EC development policy.

Like the estimates made by Sturgiss, Field, and Young (1990) for the effects of U.S. policy on Caribbean countries, the estimates given in tables 3 and 4 exclude the economic effects associated with resource misallocations, so the benefits are likely to be less than reported. Swaziland and Zimbabwe, for example, increased their exports to the world market during the 1980s despite the low world price. If world prices had not been so depressed by the EC policy, export revenues would have been higher and exports from these countries may have expanded even more quickly. Furthermore, world prices were low during 1982–88, so the reported benefits are near their maximum. At other stages of the world price cycle, when prices are higher, the gross benefits decline and may even be negative. Because the world price has risen considerably in recent years, the gross benefits from access to the EC market are less than they were from 1982 to 1988.

Japan

Japanese consumer and producer prices are maintained well above the world price, with consumer prices at five times the world price in 1985–86, and the producer price of raw sugar at eight times the world price in 1985–86. The key policy instrument is a system of fixed and variable levies on imported raw sugar, administered by a stabilization agency that trades both domestically produced and imported sugar. Direct subsidies are also paid to growers.

The high prices are intended to encourage domestic production and are set broadly in line with production costs. The very high consumer price for sugar
Table 3. Net Benefits or Losses to the African, Caribbean, and Pacific States from the European Community’s Sugar Policy, 1982–88 (millions of 1984 dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbados</td>
<td>6.73</td>
<td>11.20</td>
<td>9.93</td>
<td>11.06</td>
<td>9.41</td>
<td>16.80</td>
<td>13.72</td>
</tr>
<tr>
<td>Belize</td>
<td>3.41</td>
<td>6.80</td>
<td>6.77</td>
<td>7.73</td>
<td>6.74</td>
<td>12.67</td>
<td>9.97</td>
</tr>
<tr>
<td>Congo</td>
<td>2.34</td>
<td>2.45</td>
<td>1.82</td>
<td>2.56</td>
<td>2.01</td>
<td>3.30</td>
<td>2.63</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>-1.21</td>
<td>0.09</td>
<td>1.78</td>
<td>2.40</td>
<td>2.24</td>
<td>3.83</td>
<td>3.00</td>
</tr>
<tr>
<td>Fiji</td>
<td>14.88</td>
<td>33.58</td>
<td>29.38</td>
<td>31.14</td>
<td>30.35</td>
<td>49.29</td>
<td>39.02</td>
</tr>
<tr>
<td>Guyana</td>
<td>22.07</td>
<td>34.31</td>
<td>33.64</td>
<td>35.76</td>
<td>31.67</td>
<td>54.97</td>
<td>46.19</td>
</tr>
<tr>
<td>Jamaica</td>
<td>21.58</td>
<td>29.33</td>
<td>27.63</td>
<td>28.15</td>
<td>25.56</td>
<td>42.84</td>
<td>34.16</td>
</tr>
<tr>
<td>Madagascar</td>
<td>1.95</td>
<td>2.39</td>
<td>2.18</td>
<td>2.24</td>
<td>2.63</td>
<td>3.85</td>
<td>2.89</td>
</tr>
<tr>
<td>Malawi</td>
<td>0.45</td>
<td>2.33</td>
<td>2.31</td>
<td>1.00</td>
<td>2.35</td>
<td>4.28</td>
<td>3.27</td>
</tr>
<tr>
<td>Mauritius</td>
<td>78.56</td>
<td>112.43</td>
<td>107.23</td>
<td>114.75</td>
<td>97.98</td>
<td>166.30</td>
<td>133.64</td>
</tr>
<tr>
<td>St. Kitts and Nevis</td>
<td>1.57</td>
<td>3.21</td>
<td>2.90</td>
<td>3.26</td>
<td>2.89</td>
<td>5.03</td>
<td>4.10</td>
</tr>
<tr>
<td>Swaziland</td>
<td>7.94</td>
<td>18.91</td>
<td>16.80</td>
<td>19.61</td>
<td>13.89</td>
<td>31.20</td>
<td>24.33</td>
</tr>
<tr>
<td>Tanzania</td>
<td>1.77</td>
<td>2.00</td>
<td>2.20</td>
<td>2.33</td>
<td>2.07</td>
<td>3.53</td>
<td>2.83</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>8.88</td>
<td>11.51</td>
<td>12.78</td>
<td>10.87</td>
<td>9.56</td>
<td>16.17</td>
<td>12.96</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>-6.10</td>
<td>-0.11</td>
<td>-0.30</td>
<td>1.17</td>
<td>-0.58</td>
<td>3.62</td>
<td>4.66</td>
</tr>
</tbody>
</table>

Source: Authors' calculations.
### Table 4. Net Benefits or Losses to the African, Caribbean, and Pacific States from the European Community's Sugar Policy, Per Ton of Exports, 1982–88

(1984 dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbados</td>
<td>77.37</td>
<td>153.41</td>
<td>115.48</td>
<td>141.75</td>
<td>106.95</td>
<td>221.08</td>
<td>201.81</td>
</tr>
<tr>
<td>Belize</td>
<td>32.82</td>
<td>58.63</td>
<td>66.41</td>
<td>80.36</td>
<td>68.76</td>
<td>150.88</td>
<td>117.26</td>
</tr>
<tr>
<td>Congo</td>
<td>—</td>
<td>272.19</td>
<td>82.59</td>
<td>512.33</td>
<td>154.94</td>
<td>194.17</td>
<td>154.84</td>
</tr>
<tr>
<td>Côte d'Ivoire</td>
<td>-19.52</td>
<td>1.23</td>
<td>77.46</td>
<td>239.64</td>
<td>448.70</td>
<td>3829.93</td>
<td>499.33</td>
</tr>
<tr>
<td>Fiji</td>
<td>35.86</td>
<td>101.45</td>
<td>77.31</td>
<td>74.32</td>
<td>96.36</td>
<td>112.79</td>
<td>94.24</td>
</tr>
<tr>
<td>Guyana</td>
<td>83.30</td>
<td>128.49</td>
<td>156.48</td>
<td>155.46</td>
<td>144.63</td>
<td>281.91</td>
<td>332.33</td>
</tr>
<tr>
<td>Jamaica</td>
<td>203.58</td>
<td>308.70</td>
<td>328.97</td>
<td>230.70</td>
<td>280.84</td>
<td>516.13</td>
<td>151.87</td>
</tr>
<tr>
<td>Madagascar</td>
<td>177.05</td>
<td>132.84</td>
<td>114.84</td>
<td>97.36</td>
<td>—</td>
<td>321.04</td>
<td>151.87</td>
</tr>
<tr>
<td>Malawi</td>
<td>5.78</td>
<td>24.78</td>
<td>25.91</td>
<td>6.98</td>
<td>25.24</td>
<td>36.86</td>
<td>31.43</td>
</tr>
<tr>
<td>Mauritius</td>
<td>124.10</td>
<td>174.58</td>
<td>190.80</td>
<td>200.96</td>
<td>148.01</td>
<td>239.29</td>
<td>193.12</td>
</tr>
<tr>
<td>St. Kitts and Nevis</td>
<td>46.08</td>
<td>123.31</td>
<td>103.63</td>
<td>130.56</td>
<td>120.52</td>
<td>218.87</td>
<td>195.10</td>
</tr>
<tr>
<td>Swaziland</td>
<td>23.07</td>
<td>50.69</td>
<td>42.98</td>
<td>51.61</td>
<td>27.90</td>
<td>71.72</td>
<td>60.23</td>
</tr>
<tr>
<td>Tanzania</td>
<td>177.05</td>
<td>95.24</td>
<td>200.45</td>
<td>194.19</td>
<td>188.32</td>
<td>353.23</td>
<td>257.33</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>355.17</td>
<td>375.66</td>
<td>-327.81</td>
<td>519.85</td>
<td>289.58</td>
<td>646.82</td>
<td>392.85</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>-26.02</td>
<td>-0.48</td>
<td>-1.31</td>
<td>5.52</td>
<td>-2.14</td>
<td>15.02</td>
<td>31.25</td>
</tr>
</tbody>
</table>

*Source: Authors' calculations.*
not only reduces demand for sugar directly but also allows high-fructose corn syrup to be priced below sugar. Consumption of high-fructose corn syrup is subject to a small tax, but maize, its major raw material, can be imported duty-free. The unequal treatment of sugar and corn syrup has encouraged the production and use of the syrup in place of sugar. Although Japan is the world's second largest importer of sugar, its per capita sugar consumption is the smallest among industrial countries and has declined in recent years. The consumption of high-fructose corn syrup has risen from virtually nil before the world sugar price peaked in 1974-75 to 20 percent of the sweetener market by 1986-87. The decline in sugar consumption has been accompanied by a decline in sugar imports.

Sturgiss, Tobler, and Connell (1988) estimate that Japanese demand for sugar imports may be as much as 54 percent lower than it would be in the absence of government intervention. They also estimate that because of Japan's sugar policy, the world price is 2–5 percent lower on average and up to 14 percent lower during the trough period of the world price cycle. Also, variability measured by the coefficient of variation of prices is 11 percent higher. Japanese policy in 1986 is estimated to have cost Australia $41–50 million, Brazil $38–46 million, and the Philippines and Thailand $33–40 million, all in 1984 dollar values. It is estimated that the policy has provided high-fructose corn syrup producers with an effective subsidy of more than $700 million over the period 1985–87. Over the same period, sugar millers, processors, and growers together received subsidies of about $2 billion. The cost to Japanese consumers over the period was $7 billion. In pointing out the sheer inefficiency of Japanese policy, Sturgiss, Tobler, and Connell note that for every dollar transferred to Japanese sugar producers in 1987, the cost to Japanese consumers was an estimated $2.27 and to producers elsewhere in the world between $2.50 and $3.40.

**Joint Effects: The United States, the European Community, and Japan**

Because of interactions among policy effects, the joint effects of U.S., EC, and Japanese policies are not simply the sum of the separate effects. To estimate the joint effects, the model of Wong, Sturgiss, and Borrell (1989) was simulated assuming no intervention in the Japanese and U.S. sugar markets and minimal intervention in the European Community. EC consumers were assumed to be exposed to world prices, and A- and B-quota sugar production was assumed to be restricted to current levels of consumption. (The model cannot easily simulate complete removal of intervention because A, B, and C sugar are modeled separately.) It was assumed that consumption of high-fructose corn syrup grew in line with population growth in Japan and the United States.

The joint policies were estimated to depress the world price by 33 percent. The policies were also estimated to increase world price variability by 28 percent and to increase the probability of very low world prices. It is estimated that under current policies, the world price exceeds $0.174 per kilo-
gram (in 1984 dollar values) 83 percent of the time, whereas under the policies assumed in the simulation, the world price exceeds $0.275 per kilogram 83 percent of the time.

**Effects of Other Countries' Policies**

Large producing and consuming countries other than the United States, the European Community, and Japan may also be affecting the price of sugar through their policies. China, India, and the former U.S.S.R. heavily insulate their producers and consumers from the world price; the former U.S.S.R. also provided considerable support to the Cuban sugar industry. Studies of the separate effects of the interventions by these countries, however, are not available.

Australia and Brazil also insulate their producers and consumers from the world price to some degree. Australia is not a large producer of sugar by world standards, but it is one of the leading exporters because its domestic market is small, with annual consumption of only 0.8 million tons. In 1988–89 Australia exported 2.8 million tons of raw sugar. Sugar sold on the domestic market receives a high support price. Over the past two decades, however; protection of the industry overall has on average been low or negative (Connell 1989), because a greater proportion of Australian production is exposed to the world price than in any other country, except possibly Thailand.

The principal policy instruments are quotas on area planted and production, and the pooling of returns from domestic and export markets. The domestic price, formerly set by the government, has been market-determined since July 1989—although imported sugar is subject to duty. All sugar produced in Queensland (95 percent of total production) is compulsorily acquired by the Queensland state government. Quotas on the area that can be planted, known as "land assignments," restrict production. It is not illegal to grow sugarcane on unassigned land, but sugar produced from such cane must be sold to the Queensland government at about $0.75 per ton—well below market price; thus, in effect, land assignments are binding. Because of this tight restriction on area, increases in production are limited to those gained by more intensive use of the assigned land.

Australia can produce sugar cheaply and, in the absence of intervention, it could considerably expand its output, even at low world prices. The work of Sturgiss, Connell, and Tobler (1990) indicates that in the existing world market, each 1 percent increase in Australian production could lower the world price by up to 0.2 percent over the long term. Regulatory provisions, however, allow certain groups who benefit from production controls to resist their elimination (see Borrell and Wong 1986). The cost to the Australian economy of maintaining its intervention is conservatively estimated by Sturgiss, Connell, and Tobler at about $22.4 million per year for each 5 percent of forgone supply.

Brazil is by far the largest sugarcane producer, producing well over 200 million tons of cane annually. Only about one-third of the cane is processed into...
sugar; the majority is used to make ethanol, a gasoline substitute. Brazil is the fourth largest sugar producer after the European Community, India, and the former U.S.S.R. The vast quantities of cane grown give Brazil an immense capacity to increase sugar production. If all its cane were used to produce sugar, we estimate that Brazilian sugar output would rise from 8 million tons annually to more than 20 million tons. According to the International Sugar Organization, world sugar production is presently about 105 million tons annually.

The Brazilian cane industry features a tight net of institutional controls and interventions. The industry's ability to switch cane between ethanol and sugar production is strictly limited, although the economic incentives to divert cane from ethanol to sugar are great. Assuming a border price for gasoline of $24 per barrel, the opportunity cost for ethanol as a fuel substitute, measured in sugar equivalents, is $0.09–0.11 per kilogram. In comparison with the current world sugar price of about $0.20 per kilogram, continuing to produce ethanol from cane is clearly not its most profitable use.

The Brazilian government allocates annual production quotas to farms, mills, and distilleries to regulate the location, size, and distribution of the sugarcane crop. Domestic sugarcane, sugar, and ethanol prices are fixed, and exports are controlled. These interventions insulate producers and consumers from changes in world market conditions.

Producer prices for sugarcane, sugar, and ethanol are fixed high enough relative to costs to ensure that all available production quotas are filled. Ethanol production is not cost-competitive with imported oil, but the ethanol producer price is set sufficiently high to ensure that distilleries fulfill their quotas. Concessional credit is also provided for investment in distilleries. However, sugarcane quotas, allocated between sugar and ethanol production, are the main determinants of production. Any switching that occurs between the production of sugar and ethanol occurs as the direct result of changes in quotas only. The empirical evidence (see Wong, Sturgiss, and Borrell 1989) suggests that Brazil's capacity to shift between sugar and ethanol in response to even large changes in oil and sugar prices is greatly limited under current policies.

Like Australia, Brazil has low production costs and considerable potential to increase production even at low world prices. In the absence of intervention, output could expand significantly. Using the model of Wong, Sturgiss, and Borrell (1989), we estimate that for each 1 percent increase in Brazilian exports, the world price could be lowered by up to 0.3 percent over the long term.

Overall Effect of Policy Intervention on the Sugar Market

It is difficult to calculate how much more sugar countries such as Australia and Brazil might produce in the absence of intervention. Estimates of the total effects of intervention on the world market provide only partial insights—but insights nonetheless.
Most studies have examined the effects of intervention on the sugar market in a general, static, multicommodity framework. The Ministerial Trade Mandate model developed by the Organization for Economic Cooperation and Development (OECD 1988) includes eleven regions and fourteen commodities. Simulations of a 10 percent reduction in assistance to sugar producers from 1979–81 levels would have led to a 0.93 percent increase in the world sugar price in those years. Webb, Roningen, and Dixit (1987) used the Static World Policy Simulation model developed by the United States Department of Agriculture, with eight regions and twelve commodities. The framework of the model is similar to that used in the OECD study. The results indicate that under complete trade liberalization the 1984 world sugar price would have been 53 percent higher.

Anderson and Tyers (1986) use a model in which thirty countries and seven commodity groups are represented. Protection is measured at average 1980–82 levels. The results indicate that under full trade liberalization by Western European and East Asian countries, the world sugar price in 1987 would have been 10 percent higher and price variations would have been reduced by 22 percent. Western Europe and East Asia would have imported an additional 3.5 million tons of sugar annually, purchasing most of this from developing countries.

Zietz and Valdés (1986) analyze the effects on fifty-six developing countries of removing trade barriers in seventeen industrial countries in a multicommodity context. They show that for 1983, the world sugar price would have been 13 to 30 percent higher. This, in conjunction with their earlier work (Valdés and Zietz 1980), indicates that sugar exports from low- and middle-income developing countries would have generated up to $5 billion more in revenue (in 1980 dollar values) and that the gains from sugar liberalization are among the largest of all agricultural commodities.

The results of these studies are not strictly comparable, since the choice of the base period affects the results. Because world sugar prices were relatively high during 1979–82, the measured level of assistance to sugar producers in those years was relatively low. The results obtained by the OECD and Anderson and Tyers can therefore be treated as conservative estimates of the effects of liberalization on the world price over the longer term.

Departing from static frameworks, Wong, Sturgiss, and Borrell (1989) used a dynamic analytical model to study the adjustments made in the marketplace over time in response to policy changes. A long period, 1985 to 2004, was simulated under sixty different market scenarios, so that the results would be less sensitive to the choice of base period. Wong, Sturgiss, and Borrell found that significant reductions in the variability of the world price and sizable increases in the average price could be expected even from partial (although well-targeted) multilateral trade reforms.

They also found that if countries with low costs allowed a small volume of production (2.5 percent of world levels) to respond to the world price, and if OECD consumers were charged the world sugar price, consumption in OECD

Brent Borrell and Ronald C. Duncan
countries increased and the average world price was 7.6 percent higher than in the absence of policy reform. In addition, the variability of world prices dropped 33 percent; price peaks were lower, and prices were higher in the trough periods. The lower peaks resulted from the quick response of producers with low costs to rising world prices, and from the contraction in OECD consumption in times of high world prices. Lower price peaks reduced the incentives for producers with high costs to expand production. Although such expansions were not completely eliminated, they were lessened, resulting in a less severe price trough. Given such results, the benefits to efficient exporting countries would be sizable. For instance, Australia was estimated to benefit by as much as $294 million a year, which includes the gains in price stability enjoyed by producers.

Prospects for Policy Reform

Agricultural trade reforms are under discussion in the Uruguay Round of multilateral trade negotiations currently taking place through the GATT. Contracting parties to the GATT have agreed that there is an urgent need to overcome the policy-induced distortions of agricultural trade. The most ambitious reform proposals are those of the United States and the Cairns Group, calling for multilateral elimination of protectionist agricultural policies within ten years. Other participants, including the European Community and Japan, have been less supportive of major changes in agricultural protection. It remains to be seen whether an agricultural trade liberalization package can be agreed upon and whether this package would include substantial reform in the sugar industry.

The interests of groups involved in the sugar market are many and varied. In many cases, opposing parties cannot reconcile their differences through the political process because they are separated by national borders. Probably the main channel by which one national interest group can influence policy in another country is by influencing the world price. The results of the study by Wong, Sturgiss, and Borrell (1989) suggest that the world price level, and its variability, have the potential to modify incentives governing policy formation in several countries.

To achieve durable reforms, Wong, Sturgiss, and Borrell argue, the incentives affecting the policy formation process must be altered. This will require reducing the variability in the world price. To do this, marginal production, at least, should be exposed to the world price. The reduction of support prices could, to a small extent and in the short term, modify the drop in world price during trough periods, but would not significantly affect instability. Indeed, it could slightly intensify price peaks, which induce producers to lobby for changes that encourage production. Marginal production in the European Community is exposed to the world price since C sugar is largely unsupported. This C produc-
tion is quite responsive to the world price, as shown by the decline of total EC production by more than 3 million tons in 1983 as world prices dropped. If other sugar-producing countries adopted policy instruments similar to the C-category element of the EC policy, marginal production would respond to changes in world price, which would tend to stabilize that price.

In a growing market like that for sugar, it may be possible to make producers in several countries with low costs more responsive to the world price without imposing adjustment costs on domestic producers, consumers, or taxpayers. World sugar demand is expanding by about 2 percent annually, despite the growth of alternative sweeteners (Borrell, Wong, and Sturgiss 1989). World production must increase in some fashion to meet this increased demand. If producers with low costs were not constrained by supply control policies, they would respond more rapidly to rising world prices. In the past they have collectively responded some time after each world price peak. Without supply constraints, producers would have an incentive to anticipate growth in demand and to match their expansion more closely to emerging market opportunities. Smaller, gradual increases in production would then be more likely, rather than the large, widely separated jumps in production that have occurred in the past. If oversupply occurred and drove down the world price, marginal production would contract, so that a low world price would not persist for long periods.

The United States

Sturgiss, Field, and Young (1990) argue for the adoption of various policies that are trade-neutral. Trade-neutral support policies provide assistance to targeted producers through direct income payments from government while leaving consumption, production, and trade outcomes unchanged. Such policies could be adopted with considerable cost savings for the U.S. economy and U.S. consumers, and would also practically eliminate the costs of U.S. policy to other countries. Conflicts between U.S. domestic and foreign objectives would then be resolved. The U.S. delegation to the GATT has proposed that all countries in the Uruguay Round adopt the goal of achieving trade-neutral policies using direct income payments.

After evaluating a range of options, Sturgiss, Field, and Young conclude that to reduce the costs of U.S. policies, any reform should include direct and visible payment to producers and exposure of U.S. sugar and sweetener producers and consumers to world prices. Their study concludes with the following observation:

There is a danger that U.S. policies, if not reformed unilaterally or as part of multilateral trade negotiations, could follow the path taken earlier by EC sugar policies. The United States, with the development of new corn and chemically based sweeteners, could become

Brent Borrell and Ronald C. Duncan
a large exporter of subsidized sweeteners. This would raise the costs of the program and would also create a new set of unintended beneficiaries with a stake in seeing policies maintained. The tendency to perpetuate current inefficient policies would thus be increased.

The European Community

Because the EC sugar regime is largely self-financing and does not impose excessive budgetary costs, it is regarded within the Community as one of the less problematic components of the Common Agricultural Policy. Nonetheless, subsidies derived from price supports have constituted more than half of the revenue received by A- and B-quota sugar producers in recent years, and high consumer prices have caused consumption to be lower than otherwise. Policy reforms that expose consumers to world prices and limit or reduce subsidized production through the use of quotas would benefit the European Community as well as other exporters. In the past the European Community raised production quotas or prices following booms in the world price. If prices boom some time in the next few seasons, pressures may arise again to increase these support mechanisms. Ensuring that current production quotas and subsidized prices are not increased in response to high world prices will be an important policy challenge in the 1990s. Any reforms that reduce quota levels would considerably increase efficiency.

Japan

Many of the benefits of liberalization in Japan would come from the reduction of consumer prices and the exposure of consumers to world prices. Support for producers could be continued through the use of well-targeted direct payments from the government. Sturgiss, Tobler, and Connell (1988) conclude that direct income supplements to farmers would be a more efficient and equitable means of assistance than the current unit subsidies. Payments to induce inefficient farmers to leave the industry or incentives to establish alternative industries might be more efficient ways of providing support to various regions than the distortion of prices.

Prompted by internal forces as well as pressure from the United States, Japan introduced a number of reforms in its agricultural sector in 1988. While this may be an indication of a desire on Japan’s part to liberalize some agricultural markets, reforming the sugar industry in particular may be a low priority. To date, the reforms have mostly affected products exported by the United States. As in the United States, failure to reform the sugar industry could lead to the establishment of larger groups with a stake in retaining existing supports. The further technical development and market penetration of alternative sweeteners could ultimately increase the market share held by subsidized domestic sources.
The Cairns Group

The Cairns Group consists of Argentina, Australia, Brazil, Canada, Chile, Colombia, Fiji, Hungary, Indonesia, Malaysia, the Philippines, New Zealand, Thailand, and Uruguay. The sugar exporters of this group constitute the majority of the world's low-cost producers. Acting collectively, this group may reduce volatility of the world sugar price by allowing their producers to make their marginal production decisions based on expected world prices. As pointed out by Wong, Sturgiss, and Borrell (1989), a Cairns Group initiative designed to prevent booms on the world market could be undertaken by countries with low levels of protection independently of the high-protection countries. Such an initiative would be consistent with the Cairns Group's first aim, that is, it would prevent a buildup in protection by removing the incentive for new demands by vested interests in countries with higher sugar production costs. At the same time, such an initiative would not be likely to jeopardize other moves by the Group toward a more open trading system. Indeed, it might strengthen the position of the group. By reducing the probability of low prices, protectionist policies such as those of the European Community and the United States would be perceived as unnecessary.

Of the Cairns Group members, Australia and Brazil are the two countries with the greatest potential to influence world price variability. While production controls in Australia have recently been relaxed somewhat, they still greatly restrict the responsiveness of Australian supply. And in Brazil, instead of increasing sugar production, sugar quotas have been reduced in the past two years to allow for the expansion of ethanol output. Although Brazilian producers have pushed to relax the production controls on sugar, no significant liberalization has occurred.

Notes

Brent Borrell is chief market economist at the Centre for International Economics, Canberra, Australia. Ronald Duncan is chief of the International Trade Division in the World Bank. The authors wish to acknowledge the valuable contributions of Robert Sturgiss and Gordon Wong, whose work at the Australian Bureau of Agricultural and Resource Economics helped shape many of the ideas expressed in this paper.

1. Dollars ($) are U.S. dollars throughout.

References


