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SUGAR POLICIES: AN OPPORTUNITY FOR CHANGE

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Sugar protection dates back to at least the 1800s. It has been greatest in countries of the northern hemisphere that produce sugar beets. That is because sugar from beets is nearly twice as expensive to produce as sugar from cane, and most beet producers cannot survive without high protection. Over the years, high protection has led to lower consumption, reduced imports, and surplus production, which is disposed of in the world market at subsidized prices. Many other countries have been pressured by their producers for protection from heavily subsidized exports and depressed world market prices. The cycle of protection, subsidies, and more protection has run for decades.

The European Union (EU), Japan, and the United States are among the areas with the highest level of protection and therefore the most distorted import patterns. Since the early 1970s, U.S. sugar imports have declined from more than 5 million tons per year to slightly more than 1 million tons per year. The European Union was a net importer of about 2.5 million tons of sugar in the early 1970s, compared with net exports of about 5 million tons in recent years. Japan's sugar imports have fallen from 2.5 million tons to 1.5 million tons over the past two decades. Thus, the three largest markets for sugar imports in the 1970s have been closing to competition after becoming largely self-sufficient, at least compared with the early 1970s, when their combined net imports accounted for half of the world's exports (figure 8.1).

Background

Sugar occurs naturally in most foods, but it is economically extracted from only a few crops such as sugar beets, sugar cane, and corn. Sugar beets are an annual root crop grown in temperate climates, while sugar cane is a tall perennial grass grown in tropical and semitropical climates. About 55 countries grow sugar beets, and 105 grow sugar cane. The process of producing sugar (sucrose) from sugar beets or sugar cane requires that the juice be extracted and processed in a factory near where the beet or cane is grown. The by-products of sugar cane are bagasse and molasses. Bagasse is the residue of cane, after the juice is extracted. It has some industrial uses and is often used to fuel the

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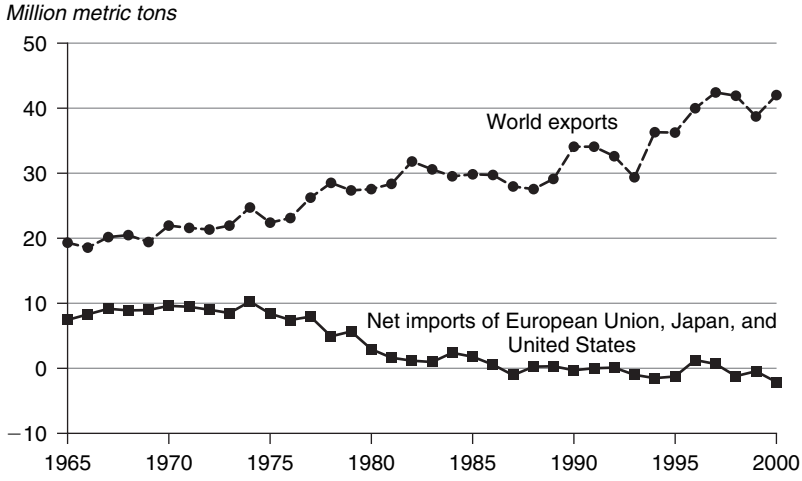
FIGURE 8.1 World Sugar Exports and Net Imports of Selected Countries
(million of tons)



Source: FAOSTAT.

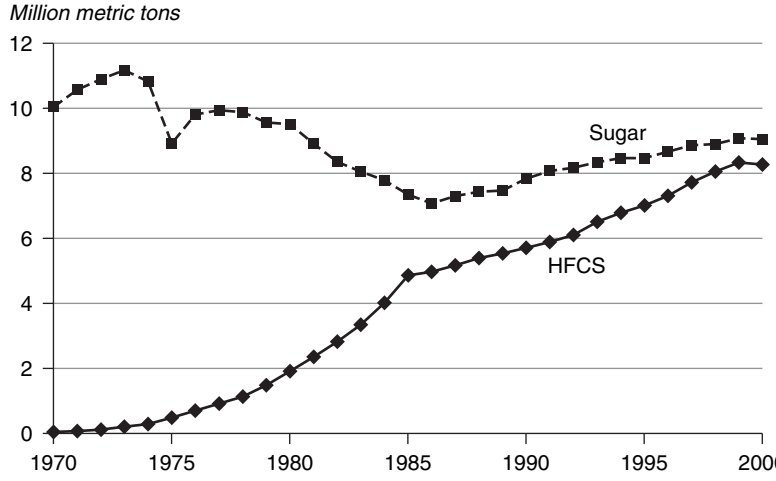
boilers in the sugar factory (also called a *sugar mill*). Molasses is an edible by-product as well as an animal feed. The by-products of sugar beets are beet tops, the leafy portion of the beet used for animal feed, and molasses, which is also used primarily as an animal feed. Once harvested, sugar cane is highly perishable and must be processed quickly. Sugar beets are less perishable than sugar cane but still must be processed soon after harvest. The high cost of transporting sugar beets or cane makes it impractical to locate the factory far from the producing areas.

Sugar growers and processors are economically interdependent and normally share in the value of total sugar and molasses sales according to a contractual agreement. Both can influence the value of total output since the volume and sugar content of sugar beets or cane is affected by input use and production practices, and the recovery of sugar from beets or cane is dependent on the technology and operation of the sugar factory. Various ownership arrangements exist in the industry—ranging from ownership by a single company of the factory and producing lands to independent growers who contract production with a factory. Some growers are members of cooperatives, which own and operate a sugar factory. State ownership of factories and lands is still common in developing countries, but substantial privatization has taken place in recent years.

Common sugar is sucrose. It is extracted in nearly pure, chemically identical form from sugar cane and sugar beets. Dextrose is a sugar derived synthetically from starch (most commonly corn starch). Fructose is a very sweet sugar derived from dextrose. High-fructose corn syrup (HFCS) is produced by the enzymatic conversion to fructose of a portion of the dextrose in corn syrup. It is chemically similar to sugar used in soft drinks, which is a mixture of equal parts of dextrose and fructose. The fact that identical or nearly identical sugars can be produced from different crops provides producers and consumers with a wide range of substitution possibilities. It also means, however, that sugar policies are often complex, as the different industries vie for support. For example, sugar producers in the European Union have been able to get legislated quotas on HFCS production. Japan also limits HFCS production to prevent it from further eroding sugar's market share. In the United States, HFCS producers benefit from high sugar prices and support current sugar policies.

High protection has led to the emergence of HFCS as a substitute for sugar in the United States and Japan. Because it is a nearly perfect substitute for sugar in uses such as soft drinks, HFCS and other corn syrups now account for 40 percent of caloric-sweetener use in Japan and more than half of U.S. caloric sweetener consumption (figure 8.2). The technique for commercial production of high-fructose corn syrup was discovered in the late 1960s and made profitable by high sugar prices in the protected Japanese and U.S. markets. But now,

FIGURE 8.2 U.S. Sugar and HFCS Consumption



Source: USDA.

economies of scale, improvements in production techniques, and large installed production capacity (financed under high prices), have made corn syrups competitive with sugar from cane and less costly than sugar from beets.

Another product that can be produced from sugar beets, sugar cane, and corn (and some other crops) is ethanol—a clear colorless, flammable, oxygenated hydrocarbon that can be used for a number of purposes, including as a vehicle fuel, a use that accounts for about two-thirds of world ethanol consumption. It is normally more costly than petroleum-based fuels, however, and is used only when special incentives, such as environmental regulations or government subsidies encourage its production and use. Ethanol can be produced from crude oil, ethylene, and coal, or from agricultural products. Roughly 60 percent of global ethanol production comes from sugar cane and sugar beets. In Brazil, half of sugar cane production is used for ethanol production; government ethanol policies mandate the share of ethanol to be blended with gasoline.

The United States is a major producer and consumer of ethanol from corn. Ethanol has environmental advantages when used as a fuel, because it burns cleaner than gasoline and does not produce greenhouse gases. In 1990 amendments to the U.S. Clean Air Act required certain U.S. regions to use oxygenated, reformulated gasoline during certain high-smog months and stipulated that a certain percentage of oxygenates must be derived from renewable sources such as corn. The legislation provided tax incentives for ethanol, amounting to $0.54 cents a gallon when blended with gasoline at a 10 percent rate. Some Midwestern states provide additional tax incentives.

The cost of ethanol production from corn is about $1.10 per gallon, but because ethanol contains less energy than gasoline, the comparable energy-equivalent cost is $1.65 per gallon (Oregon Office of Energy 2002). Thus, with the $0.54 tax incentive, ethanol is competitive with regular gasoline. In response to the incentive, U.S. ethanol production has been growing by about 6 percent per year (Berg 2001). Both HFCS and ethanol can be produced in the same facility by adding an ethanol unit to an HFCS facility, so the tax incentive on ethanol partly finances the facilities that produce HFCS. A seasonal complementarity between ethanol and HFCS production is also possible because ethanol is used for fuels primarily during the winter months, whereas the demand for HFCS in soft drinks increases during summer months. The U.S. ethanol policy contributes to production capacity, which also can be used for HFCS production, thereby reducing HFCS production costs and making HFCS more competitive with sugar.

Estimates of Production Costs

Although the costs of producing sugar vary among countries for a variety of reasons, it is cheaper to produce it from cane than from beets in all

countries. LMC International, a London-based consulting firm, periodically estimates production costs for cane sugar, beet sugar, and HFCS. The firm's most recent estimates cover 41 beet-producing countries, 63 cane-producing countries, and 19 HFCS-producing countries (table 8.1). LMC bases its estimates on an engineering cost approach that accounts for the physical inputs of labor, machinery, fuel, chemicals, and fertilizers used in field and factory. The estimates are of actual average costs and include the impact of policies that protect producers in certain countries. Such cost estimates do not represent the supply curve normally estimated by economists, since they are not estimates of marginal costs. Nevertheless, they are useful for comparing the average costs of production of different products. Actual raw cane sugar prices are provided for comparison. The prices are f.o.b. (free on board), while costs are exfactory; thus the prices should be higher.

The average cost of producing raw cane sugar by major exporters was 10.39 U.S. cents per pound in 1994–99, while the average cost of refined cane sugar was 14.25 cents per pound. Thus the raw-to-white spread averaged 3.86 cents per pound. Refined sugar from beets cost an average of 25.31 cents per pound—78 percent more than refined cane sugar. Among low-cost producers, the difference between refined cane and beet sugar was even wider. The average production cost for low-cost producers of refined cane sugar was 11.44 cents per pound, compared with 22.29 cents per pound for refined beet sugar—a difference of 95 percent. Based on this comparison, sugar from beets was not competitive with sugar from cane by either major exporters or low-cost producers. However, the wide

TABLE 8.1 Average Costs of Producing Cane Sugar, Beet Sugar, and High-Fructose Corn Syrup by Categories of Producers, and Actual Sugar Prices, 1994–1999
(nominal U.S. cents per pound[a])

Category	1994–95	1995–96	1996–97	1997–98	1998–99
Raw cane sugar					
Low cost producers[b]	7.43	8.10	8.18	7.78	7.58
Major exporters[c]	10.37	10.60	10.72	10.52	9.73
Cane sugar, white equiv.					
Low cost producers[b]	11.02	11.75	11.84	11.41	11.19
Major exporters[c]	14.23	14.48	14.61	14.38	13.53
Beet sugar, refined					
Low cost producers[d]	21.31	23.16	23.09	21.21	22.67
Major exporters[e]	25.47	26.87	25.90	23.56	24.75
High-fructose corn syrup[f]					
Major producers[g]	13.45	16.78	13.57	12.86	11.76
Actual market prices					
Raw cane sugar[h]	13.53	12.23	11.21	10.71	7.05

a. Exfactory basis.
b. Average of 5 producing regions (Australia, Brazil–Center/South, Guatemala, Zambia, and Zimbabwe).
c. Average of 7 countries (Australia, Brazil, Colombia, Cuba, Guatemala, South Africa, and Thailand).
d. Average of 7 countries (Belgium, Canada, Chile, France, Turkey, United Kingdom, and United States).
e. Average of 4 countries (Belgium, France, Germany, and Turkey).
f. HFCS-55, dry weight.
g. Average of 19 countries (Argentina, Belgium, Canada, Egypt, Finland, France, Germany, Hungary, Italy, Japan, Mexico, Netherlands, the Slovak Republic, the Republic of Korea, Spain, Taiwan (China), Turkey, United Kingdom, and United States).
h. Raw cane sugar price is U.S. cents per pound, July-June average of monthly prices, f.o.b. Caribbean ports.
Source: LMC International (1999). Actual market prices are from World Bank databases.

margin between refined sugar from beets and cane is partly a reflection of protection to sugar beet producers in the European Union and United States, which encourages production in marginal areas and contributes to higher average costs.

Production costs for HFCS-55 (55 percent fructose) averaged 13.68 cents per pound and were lower than white sugar from cane produced by major exporters in four of the five years. They exceeded the cost of cane sugar only when corn prices rose sharply in 1995–96. Thus, HFCS-55 can compete with refined cane sugar in the current policy environment, and perhaps even in a fully liberalized market environment, since many studies have suggested that raw sugar prices would rise more than corn prices under liberalization.

Employment

Data on employment in developing countries' sugar industries are not readily available but can be estimated from reports, surveys, and industry statements. Such estimates (table 8.2) show considerable cross-country consistency among high- and low-cost producers. For example, Brazil, Guyana, and South Africa are known to be among the lowest-cost producers; raw-sugar production per industry employee for those countries is estimated to range from 16.3 tons to 19.9 tons. In contrast, countries known to be high-cost producers such as Fiji, Kenya, and Mauritius have production of 7.0 to 8.3 tons of raw sugar per industry employee. Thus, one can reasonably conclude that an additional million tons of sugar production from a low-cost sugar-producing country would generate about 55,500 direct employment jobs. If the exports came from a high-cost producer, the same million tons of production would generate about 128,000 direct employment jobs. Additional indirect employment jobs would also be generated in transportation and related industries, but no attempt was made to estimate these jobs.

The World Sugar Market

Brazil, the European Union, and India are the largest sugar producers, each accounting for roughly 14 percent of world production during 1999–2001 (table 8.3). They are followed by China and the United States, which each produce about 6 percent of the world's sugar. Sugar trade is dominated by Brazil and Russia, with Brazil accounting for about one-quarter of world net exports and Russia accounting for about 14 percent of world

TABLE 8.2 Raw Sugar Produced Annually per Sugar Industry Employee, Selected Developing Countries

Country	Direct Employment (Growers and Factory)	Tons of Raw Sugar Produced, Average 1999–2001	Tons of Raw Sugar Produced Per Employee
Low-cost producers			
Brazil	1,100,000	19,485,000	17.7
Guyana	18,000	293,072	16.3
South Africa	130,000	2,589,667	19.9
High-cost producers			
Fiji	40,500	336,333	8.3
Kenya	69,000	485,333	7.0
Mauritius	65,000	529,299	8.1
Other producers			
Malawi	17,000	200,667	11.8
Mexico	300,000	5,069,233	16.9

Note: Production is the three-year average of raw sugar production during 1999–2001 from FAOSTAT.
Source: Employment figures are derived from various sources and include total direct employment in sugar factories and plantations. Employment data for Brazil, Mexico, and South Africa are from OECD (2002a); Fiji, Guyana, and Mauritius data are from F. O. Licht (2002); Kenya data are from the Kenya Sugar Board; Malawi data are from the Malawi Ministry of Commerce and Industry.

TABLE 8.3 Major Sugar Producers, Net Exporters, and Net Importers, 1999–2001 Average

Producers		*Net Exporters*		*Net Importers*	
Country/Region	Millions of Tons	Country/Region	Millions of Tons	Country/Region	Millions of Tons
India	19.4	Brazil	9.3	Russia	5.2
European Union	18.6	European Union	4.2	Indonesia	1.7
Brazil	18.5	Australia	3.8	Japan	1.6
United States	7.9	Thailand	3.6	United States	1.4
China	7.8	Cuba	3.2	Korea, Rep. of	1.2
Thailand	5.4	South Africa	1.3	Canada	1.2
Mexico	5.1	Guatemala	1.1	Iran	1.0
Australia	4.9	Colombia	1.0	Malaysia	1.0
Cuba	3.8	Turkey	0.6	Algeria	0.9
Pakistan	3.0	Mauritius	0.5	Nigeria	0.7
All other	38.9	All other	10.3	All other	20.7
World	133.3	World	38.9	World	36.6

Note: Data are in raw sugar equivalents.
Source: USDA Production Supply and Distribution (PS&D) 2002.

net imports during 1999–2001. The European Union is the second largest net exporter, followed by Australia, Cuba, and Thailand, which each export about 8–10 percent of the world total. Net imports are widely dispersed after Russia, with the next largest net importer accounting for less than 5 percent of world imports. India is the largest sugar consumer, with about 15 percent of world consumption, followed by the European Union with 10 percent, and Brazil with 7 percent.

World HFCS production averaged 11.7 million tons (dry weight basis) during 1999–2001. Production in the United States alone averaged 9.2 million tons—79 percent of the world total. Japan was the second-largest producer, with an average of .78 million tons, followed by Argentina, Canada, European Union, Mexico, and Republic of Korea with between .3 and .4 tons each. HFCS is considered equivalent to sugar on a dry weight basis when used to produce products such as soft drinks.

World sugar prices have historically been characterized by periodic sharp increases followed by long periods of low or declining prices. This pattern has been caused, in large part, by policies in both developed and developing countries that isolated consumers and producers from international prices and diminished their price responsiveness. Since the early 1980s, however, some developing countries have reformed their policies. As the share of those countries in global consumption and imports has increased with population and income growth, the reformed policies have led to greater price responsiveness by sugar producers and consumers, likely reducing the severity of future price spikes. The collapse of the former Soviet Union also led to the abandonment of dedicated sugar imports from Cuba and increased trade at world market prices. Many developed countries still maintain highly protected sugar sectors and thus contribute to the likelihood of price spikes, but they now account for only one-third of consumption and one-half of imports—compared with slightly more than half of consumption and 60 percent of imports when the last sugar price spike occurred in 1980.

Despite some liberalization of sugar policies, roughly 80 percent of world sugar production and 60 percent of world sugar trade is at subsidized or protected prices. Only three major producers (Australia, Brazil, and Cuba) have sugar sectors that produce and operate at world market price levels.[1] These three producers account for a combined 20 percent of world production and 40 percent of world trade. The remaining 80 percent of world production and 60 percent of world trade relies on production subsidies, export subsidies, or preferential access to protected markets. The European

Union, Japan, and the United States account for 20 percent of world production; their average producer prices are more than double the world market. China and India account for another 20 percent of world production and protect producers with prices that are higher than world market prices. The remaining 40 percent of production is in countries that either produce for preferential markets (as is the case with Fiji, Mauritius, the Philippines, and many African and Caribbean countries) and thus receive prices higher than those of the world market, or they protect their domestic producers with policies that restrict imports to provide above-market prices.

The value of world sugar exports has remained relatively constant in nominal dollars ($11.8 billion during 1980–85; $11.6 billion during 1995–2000), and sugar has remained an important source of export earnings for some developing countries. However, the share of developing countries in total sugar exports declined from 71 percent during 1980–85 to 54 percent in 1995–2000, as developed-country exports increased and the share of higher-valued refined-sugar exports by developed countries increased. Twelve countries received 10 percent or more of their total export earnings from sugar during 1995–2000, and an additional five received 5–10 percent. In contrast, during 1980–85, ten countries received 20 percent or more of total exports from sugar, and nine additional countries received from 5–20 percent.

Sugar Policies in Selected Developing Countries

Although this chapter focuses on prospects for policy reform in the European Union, Japan, and the United States, it is useful to examine policies in other major sugar-producing and -trading countries to see how they would be affected by such reforms.

Brazil—the world's largest sugar exporter and generally considered to be its lowest-cost producer—would be a major beneficiary of increased world sugar trade and higher prices because it has the capacity to increase sugar production and exports substantially. The devaluation of the Brazilian *real* by 65 percent relative to the dollar since 1998 has contributed to the country's competitiveness. Despite its dominance, however, exports are viewed as the third alternative for Brazilian sugar cane after production of fuel ethanol and sugar for the large domestic market. Only half of Brazil's sugar cane is used to produce sugar; the other half goes into ethanol for automotive fuel. Sugar cane can easily be divided between sugar and ethanol production depending on market conditions and government policies. If all of Brazil's sugar cane were used to produce sugar, production could roughly double (an increase of roughly 18.5 million tons per year). Most of the increase could be exported, subject to port and milling capacity.

The Brazilian government has pursued a biofuel policy since the 1970s, when concerns about the adequacy of petroleum supplies were high. These policies included tax incentives and direct subsidies for ethanol production and use, sugar price controls, and restrictions on sugar exports. Lower petroleum prices during the 1980s led to reduced ethanol subsidies and the removal of export and price controls on sugar beginning in 1990. Other controls on sugar were eased during the 1990s, and sugar exports increased from 1.5 million tons in 1990–91 to 11.3 million tons in 2000–01. Some subsidies remain on ethanol production and use, and the future of such subsidies can strongly influence the use of sugar cane for ethanol versus sugar production. Government mandates on the share of ethanol to be included in gasoline (currently 20–24 percent) can strongly influence demand for ethanol as automotive fuel and the supplies of sugar cane directed to sugar production. The future of the biofuel program depends on international petroleum prices as well as Brazilian policy. Recently marketed flex-fuel automobile engines that run equally well on gasoline or pure hydrous alcohol are expected to boost ethanol demand and direct some sugar cane production away from sugar production and exports.

Sugar cane production has increased rapidly in the center-south region of Brazil, where the climate is favorable, land is available, and sugar cane yields good returns relative to other crops. Further expansion of sugar cane production in the center-south region is possible and expected by most industry experts, but milling capacity will need to be expanded to allow significantly more sugar production. Sugar is also produced in the northeast region, where high-cost growers receive a small

subsidy. The central government allocates Brazil's total annual quota of premium-priced U.S. imports to this region.

China was an occasional large sugar importer and exporter in the 1990s, but average net imports were about 400,000 tons during 1990–2000. Most of these imports came from Cuba under a long-term trade agreement. The government has followed a policy aimed at self-sufficiency by providing strong price incentives to producers, controlling imports, and accumulating and releasing government stocks to maintain high internal market prices. About 90 percent of China's sugar production comes from sugar cane and the remainder from sugar beets. A "guidance price" is provided to sugar refiners for sugar cane and beet, but market forces largely determine prices (Sheales and others 1999). The policy and strong demand growth kept sugar prices high during most of the 1990s, but prices fell sharply after the record 1998–99 crop, remaining low through 2000. Prices increased in 2001, with white wholesale sugar prices averaging about $0.22 per pound during the first half of 2001 (F. O. Licht 2002), more than double the world market price and similar to U.S. domestic prices. A record 2002–03 harvest caused prices to fall again.

Artificial sweeteners, mainly saccharin, are an important competitor to sugar in China and substitute for as much as 2.4 million tons. When China entered the World Trade Organization (WTO) in 2001, it agreed to a tariff rate quota of 1.6 million tons of sugar at a tariff rate of 20 percent, with an over-quota tariff of 76 percent. The quota is scheduled to increase to 1.945 million tons, and the over-quota rate to fall to 65 percent, by 2004. If China were to import the full amount specified by the tariff rate quota, imports would increase substantially over the levels of recent years. China's WTO tariff quota does not commit the country to import all of the quota tonnage, however, and China can choose among a number of different methods of administering the quota to influence its fill rate (Jolly 2001). For example, actual imports during 2001–02 were 1.15 million tons, according to the International Sugar Organization (2002), despite the tariff rate quota of 1.6 million tons. The Chinese sugar industry would undergo substantial adjustment if it were opened to international competition. A large number of small, high-cost sugar mills would become unprofitable, and production would likely decline.

India's sugar industry, heavily regulated under the Essential Commodities Act of 1955, is very politicized because of the large number of sugar cane growers (reportedly as many as 5 million) and the importance of sugar in Indian diets. The industry is largely self-sufficient, with occasional imports to offset domestic shortfalls. An import duty (currently 60 percent) is varied to maintain domestic prices above those of the world market. Large stocks of sugar currently burden the industry and can only be exported with substantial subsidies or at substantial losses. India provides an internal freight reimbursement and ocean freight subsidy to help export surplus production. State controls limit internal sugar movements, and licensing and stockholding requirements for mills and shops contribute to industry inefficiencies. Sugar mills are small and inefficient, and high internal transport costs would limit export potential even if world prices were to rise above internal prices. Sugar millers and importers are required to sell a portion of their supplies to the Public Distribution System at below-market prices for resale to low-income consumers. Sugar-cane production is more profitable than most other crops, with prices that are about 50 percent higher than world market prices due to minimums established by the central government and higher prices advised by the states.

India has a small ethanol program, and there are government proposals to require ethanol to be blended with gasoline to reduce pollution. The government has announced plans to liberalize the sector, but past efforts at liberalization have been unsuccessful. Decades of regulation have also created complicated political interdependencies that will be difficult to disentangle. It is unlikely that India would emerge as a significant exporter even if policies in the European Union, Japan, and the United States were changed to allow greater imports.

Mexico privatized its sugar mills and partially deregulated its sugar industry in reforms that concluded in 1992 (Escandon 2002). It has maintained strong government regulation of the sector, however, by setting sugar-cane prices for its 150,000 growers. Mexico liberalized pricing and production of sugar in 1995 but simultaneously increased protection by increasing tariffs from 65 percent to 136 percent on raw sugar and from 73 percent to 127 percent on refined sugar. This led to a 60 percent increase in domestic sugar prices, a 50 percent

increase in production, and a doubling of exports from 1992 to 2002.

The North American Free Trade Agreement (NAFTA) came into force on January 1, 1994. A 15-year adjustment period ending in 2008 was to be followed by free trade in sugar between Mexico and the United States. The implementation of NAFTA has been contentious because of a last-minute side-letter agreement on sugar added to ensure approval by the U.S. Congress. Although the side-letter agreement was never ratified by Mexico's Congress and is not recognized as valid by Mexico, the U.S. government administers NAFTA in accordance with its terms. Under NAFTA, the amount of Mexico's duty-free access to the U.S. sugar market depends on whether Mexico is a surplus sugar producer (sugar production minus sugar consumption). The side-letter agreement changed the definition of surplus producer to include HFCS consumption as well as sugar consumption. Using this definition, Mexico could export up to 25,000 tons per year of surplus sugar duty-free during the first 6 years of NAFTA. Beginning in year 7 (the 2000–01 marketing year), and until the end of the 15-year adjustment period, Mexico could export up to 250,000 tons of surplus sugar duty-free.

High prices for sugar in Mexico led to large imports and increased production of HFCS, which quickly displaced sugar in the soft-drinks industry and left Mexico with large sugar stocks that could not be exported duty-free to the United States because of the 25,000 ton limit. After the United States rejected a request to allow increased duty-free exports, Mexico charged that the United States was dumping HFCS in Mexico and initiated antidumping duties. Negotiations are continuing to resolve the trade and duties on HFCS.

Caught between the high prices that the government had established for sugar cane and the weak domestic and world market prices for sugar, many of Mexico's 60 sugar mills became insolvent. The government expropriated 27 mills with large and unpayable debts in September 2001. Public investments are being made to prepare these mills for resale to private investors.

Among the measures in Mexico's national sugar policy for 2002–2006, which is designed to make the sector profitable, is the formation of an export cooperative of all private and government-owned sugar mills. Mexico's sugar exports in the 2001–02 marketing year are estimated to total 650,000 tons, of which 148,000 tons were exported to the United States duty-free. Beginning in 2009, Mexico will have unlimited duty-free access to the U.S. sugar market and will likely increase exports substantially.

The Russian Federation is by far the world's largest sugar importer, with average annual imports of 5.2 million tons during 1999–2001, three times the amount of the next largest importer. Following the breakup of the Soviet Union, the Russian sugar sector faced an uncertain future, an unstable and confused policy structure, and a technically weak industry. Sugar production, all from beets, declined by about 45 percent from 1992 to 2000, while consumption declined by 17 percent and sugar imports increased by 35 percent. Low beet yields, poor factory recovery rates, outdated technology, and shortages of fuel and replacement parts hampered the adjustment of the Russian sugar industry to privatization. With trade policy changing frequently, high perceived risks discouraged foreign direct investment and slowed the modernization of the industry.

The government uses high tariffs to protect the domestic industry. To protect domestic sugar refiners, tariffs on white sugar are higher than on raw sugar. Seasonal tariffs are added during periods of peak domestic production to protect local producers and support prices. The import duty on raw cane sugar for 2003 has been set at $95 per ton ($.043 per pound). Russia is expected to remain a large importer as long as the investment climate remains uncertain and foreign companies are reluctant to invest. Even with foreign investment, Russia will likely remain a high-cost producer because its industry is based on beets.

Thailand is the world's fourth-largest sugar exporter, with net exports of 3.6 million tons during 1999–2001 (annual average). Thailand's sugar policy is patterned after that of the European Union, with high internal sugar prices maintained by quotas and import tariffs. The government uses production quotas, tax incentives, and subsidized credit to encourage exports. The tariff rate quota agreed under the WTO Agreement on Agriculture was 65 percent for in-quota imports in 1999 and 99 percent for outside-quota imports (Sheales and others 1999). Despite high protection, Thailand's costs of production are among the lowest in the world, roughly comparable to those of Australia

(Borrell and Pearce 1999). High protection and low costs have led to rapid growth of production and a more than tripling of exports over the past two decades.

This selective review of policies in major sugar-producing and -trading countries illustrates the significance of policy distortions in the world sugar market. India, the largest sugar producer, has a heavily regulated domestic sugar market and high import tariffs to protect local producers. China's import restrictions keep domestic sugar prices nearly as high as those in the United States. Russia, the largest net importer, has high tariffs to protect sugar-beet producers and additional tariffs on white sugar to protect local refiners. Brazil, the largest sugar exporter, has a sugar policy that is partly driven by its biofuel policies; until recently it restricted sugar exports. Thailand, the fourth-largest net exporter and a low-cost producer, has used high domestic prices, tax incentives, and subsidized credit to increase exports. Mexico's high domestic prices have stimulated production in anticipation of unlimited duty-free access to the U.S. sugar market beginning in 2009.

Sugar Policies in Selected OECD Countries

More than half of the value of sugar production in OECD (Organisation for Economic Co-operation and Development) countries during 1999–2001 came from government support or transfers from consumers. Such high support typically limits consumption through high prices and encourages production even when a country does not have a comparative advantage in sugar production. Support to OECD sugar producers during 1999–2001 totaled $6.35 billion, more than half the value of world sugar trade (about $11.6 billion) and nearly equal to developing-country exports of about $6.5 billion. The European Union provided the largest annual support, with $2.71 billion, while the United States provided $1.30 billion, and Japan provided $0.44 billion. Several developing countries also provided high levels of support to sugar producers, including Mexico, Poland, and Turkey (table 8.4). Much of that support is provided through border protection.

The benefits of more liberalized trade in sugar and reduced domestic support, especially in OECD

TABLE 8.4 Government Support to Sugar Producers, 1999–2001

Country/Region	Producer Support (million US$)	Producer Nominal Assistance Coefficient	Support from Border Protection (percent)
OECD	6,351	2.11	n.a.
Australia	51	1.11	0.0
Czech Republic	16	1.25	47.6
European Union	2,713	2.11	91.7
Hungary	12	1.20	41.5
Japan	437	2.17	88.7
Mexico	713	2.10	83.9
Poland	176	2.28	92.9
Slovak Republic	16	1.94	54.7
Switzerland	86	4.36	73.0
Turkey	749	3.02	95.8
United States	1,302	2.37	84.3

n.a. Not applicable.

Note: Producer support was converted from local currency to U.S. dollars using period average annual exchange rates from the IMF's *International Financial Statistics,* May 2002. Producer nominal assistance coefficient is an indicator of the nominal rate of assistance to producers measuring the ratio between the value of gross farm receipts including support and gross farm receipts valued at world market prices without support. No calculations were made for Canada, Iceland, New Zealand, Norway, or the Republic of Korea.

Source: OECD 2002b.

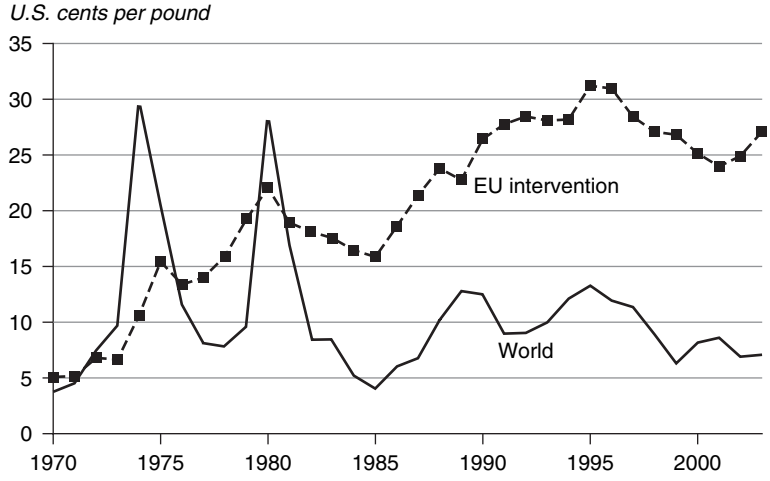
countries, are substantial, according to several studies (Borrell and Pearce 1999; Devadoss and Kropf 1996; Elbehri and others 2000; El-Obeid and Beghin 2004; USGAO 1993 and 2000; Sheales and others 1999; USITC 2002; van der Mensbrugghe, Beghin, Mitchell 2003; Wohlgenant 1999). Study results differ because of different assumptions, methodologies, and scenarios, but the general conclusion is that reduced support to OECD sugar producers would result in lower production in those countries, lower domestic prices, increased consumption, and increased net imports. World sugar prices would increase and exports from developing countries, and some developed-country exporters, would rise. According to Sheales and others (1999), full liberalization of the world sugar market would result in a 41 percent increase in world sugar prices. Sugar imports would increase by 44 percent in the United States. Exports would decline by 34 percent in the European Union. Low-cost sugar-producing countries would increase exports, with Australia's exports rising 16 percent, Brazil's 23 percent, and Thailand's 22 percent. Removal of government support from domestic producers in the European Union, Japan, and the United States would save consumers $4.8 billion per year. A study by the U.S. General Accounting Office (USGAO 2000) concluded that the U.S. sugar program resulted in a net loss to the U.S. economy of $1 billion in 1998. Elbehri and others (2000) used the global trade analysis project (GTAP) multisectoral, multiregional general-equilibrium model to examine the impacts of partially liberalizing sugar tariff-rate-quota regimes, concluding that cutting the European Union's over-quota tariff by one-third would yield a global welfare gain of $568 million. Coordinated global reforms would result in the greatest benefits. Wohlgenant (1999) estimated that global sugar-trade liberalization would result in a 43 percent increase in world price.

Borrell and Pearce (1999) used a 24-region model of the global sweetener market to examine consumption, production, trade, price, and welfare effects for seven classes of sweeteners. A baseline projection that continued current protection was compared with a fully liberalized market with no trade protection or domestic support in any country or region. Under the fully liberalized scenario, sugar prices were projected to fall from the baseline by 65 percent in Japan; 40 percent in Western Europe; 25 percent in Eastern Europe, Indonesia, Mexico, and the United States; and 10 percent in China, the Philippines, and Ukraine. Lower prices would lead to higher consumption, lower production, and increased imports of sugar in those countries that had trade protection. World prices would increase by 38 percent, and lower-cost producers would increase production and exports—however consumption decreased from the higher prices. In countries with the highest protection (Europe, Indonesia, Japan, the United States), net imports would increase by 15 million tons per year. Japan's production would drop by 44 percent, that of the United States by 32 percent, and Western Europe's by 21 percent. Among low-cost producers and exporters, Australia and Thailand would increase production by 25 percent, and Brazil, Cuba, and other Latin American countries (excluding Brazil, Mexico, and Cuba) would increase production by about 15 percent.

Global welfare gains from full liberalization are estimated by Borrell and Pearce (1999) to total $4.7 billion per year based on historical supply responses; gain could go as high as $6.3 billion per year if higher supply responses occur. Brazilian producers would gain the most from liberalization, at around $2.6 billion per year, but this would be offset by a loss of $1 billion to Brazilian consumers who would pay higher prices after liberalization—leaving a net gain of $1.6 billion for Brazil. Japan would enjoy a net gain of about $0.4 billion from lower consumer prices that would more than offset lower producer prices on the 40 percent of sugar that is domestically produced. The United States would have a small net gain of about $0.5 billion from full liberalization, with consumer gains slightly larger than producer losses. Western Europe would gain about $1.5 billion as consumer gains of about $4.8 billion exceeded producer losses of about $3.3 billion.

The exporting countries that now enjoy preferential access to European and U.S. sugar markets gain about $0.8 billion per year from prices that are more than twice world market prices on sales to the European Union, and 80 percent more than the world market price for sales to the United States. The value of the preferential access is less than it appears, however, because many of these producers have high production costs and would not produce as much at world market prices. Further, world

FIGURE 8.3 Sugar Prices, 1970–2003



market prices would rise by an estimated 38 percent after full liberalization, partially offsetting the loss of high prices in preferential markets for producers. Borrell and Pearce (1999) estimate the net loss to these exporting countries from full liberalization at $0.45 billion. The cost to taxpayers in the European Union and United States of providing each $1 of preferential access is estimated to be more than $5. In a recent study of the Fijian economy (Levantis, Jotzo, and Tulpule 2003), alternative forms of aid were found to deliver much greater economic benefits and growth prospects.

Caribbean sugar producers are among the largest group of countries having preferential access to the European and U.S. sugar markets. A recent study (Mitchell 2004) found that most of the Caribbean producers cannot export profitably even to the European Union, which pays prices that are more than triple those of the world market. Many of these countries have abandoned their U.S. quotas because they do not produce enough to satisfy both their EU and U.S. quotas, and EU quotas have higher prices.

While the benefits to reform are not widely disputed, the opposition to reform within certain countries has been strong. The remainder of this section examines the sugar policies of the European Union, Japan, and the United States with an eye to the prospects for reform.

The European Union's Sugar Policy

The European Union's sugar policy uses production quotas, import controls, and export refunds (subsidies) to support producer prices at levels well above international prices. The program is financed primarily by the European Union's consumers, who pay high prices for sugar. The sugar policy began in 1965 as part of the Common Agricultural Policy (CAP). Under the CAP, intervention sugar prices have been constant in nominal terms since 1984–85; however, they vary with exchange rates when expressed in U.S. dollars (figure 8.3). They have been more than double world market prices during most of the past 20 years. Import duties are used to prevent lower-priced imports from the world market, and export refunds are paid to exporters to cover the gap between the EU price and the generally lower world market prices when commodities are sold from intervention stocks.

Production quotas limit the amount of sugar eligible for price support. Quotas are divided into categories A and B, with different levels of price support. Sugar production in excess of quota is classed as C sugar and is not supported, but it can be carried over for use as quota sugar in the next year or exported at world market prices. The total of A and B quota sugar was 14.592 million tons in 2000–01, of which 11.983 million tons was for A quota and 2.611 million tons was for B quota (USDA 2003). The quotas have been declining to meet WTO commitments. The surplus of A and B quota sugar above domestic consumption is about 1.5 million tons; it is exported with subsidy. Excess quota (C sugar) averaged 1.59 million tons (white equivalent) between 1995–96 and 2000–01. Thus, the EU sugar program results in about 3.1 million tons of sugar exports per year (about 10 percent of

world exports), and half of this is subsidized.[2] Critics of EU policy charge that A and B quota sugar is subsidizing the production and export of C sugar. Australia, Brazil, and Thailand have filed a complaint with the WTO to that effect.

Production levies are applied to all quota sugar production to cover the costs of export refunds. The levy on A quota sugar is 2 percent, whereas the levy on B quota varies from 30 percent to 37 percent depending on world market prices. An additional levy can be collected in the next marketing year to recover any shortfall in export refunds. Quotas are also set for some alternative sweeteners such as HFCS (known as isoglucose within the European Union) and inulin (produced from chicory and Jerusalem artichoke). The quota for production of HFCS is 303,000 tons; that for inulin is 323,000 tons.

The Uruguay Round commitments had little initial impact on the European Union's sugar regime. The variable import levy was replaced by a fixed duty plus a safeguard clause allowing for a variable additional duty with minimal impact on protection to sugar beet producers. The European Union agreed to reduce both the amount spent on export refunds and the volume of sugar exported with subsidy. Export refunds are also payable on sugar exported in the form of processed goods such as sugar confectionery, chocolate, biscuits, cakes, ice cream, soft drinks, and so on. The European Union amended legislation to allow changes in sugar-production quotas on an annual basis (rather than the previous five-year basis) to ensure that the limits on exports were met. The WTO commitment was to reduce only the subsidized exports net of preferential imports. This is a small proportion of total exports, and amounted to just 34 million tons from the 1986–90 base of 1.612 million tons per year.

Preferential access to the European Union's sugar market and its high prices are granted to the 46 countries from Africa, the Caribbean, and the Pacific (ACP) that signed the first Lomé Convention in 1975. The Lomé sugar protocol provided for imports of specified quantities of raw or white cane sugar originating in the ACP states at guaranteed prices. Unlike most articles of the Lomé Convention, the sugar protocol does not expire and cannot be changed unilaterally. The original quantities specified were 1,294,700 tons of white-sugar equivalent, with an additional amount allotted to India. The total import commitment was for 1,304,700 tons; this amount has remained constant, with reallocation of quotas among existing members when a country did not fulfill its quota. The sugar imported under the Lomé Convention is known as "preference sugar." An additional import allocation of between 200,000 and 350,000 tons of sugar was made to ACP countries (primarily) in 1995. This allocation of "special preference sugar" is not permanent, and the quantity can vary based on import needs. The price specified for special preference sugar was 85 percent of the guaranteed price for the permanent preference sugar. In addition, the European Union took over the WTO import commitments of the new members joining the European Union in 1995. These included a tariff quota of 85,500 tons, mainly from Brazil, with an in-quota tariff rate of 98 ECU (European currency unit) per ton. The European Union has also granted several countries in the Balkans temporary access to its sugar market. Imports under this program totaled about 100,000 tons in 2001–02. In total, the EU permanent import commitment is 1.39 million tons (white sugar equivalent) plus additional quantities of up to 450,000 tons of temporary imports.

The European Union's Everything But Arms initiative (EBA), approved in 2001, allows duty-free access to the EU sugar market by the 48 least-developed countries (39 are ACP countries). It could become the largest of the European Union's commitments. Initially EBA imports will be limited by quotas, and the sugar imported will be counted against the quota of special preference sugar. The EBA quota will increase annually until full duty-free access for white and raw sugar is allowed in 2009. Safeguard clauses in the EBA initiative could be used to limit imports, but these would be difficult for the European Union to invoke because doing so would be seen in the least-developed countries as a policy reversal.

Imported sugar will eventually displace domestic EU production and could severely strain the EU sugar regime. The European Commission estimated the possible impact of the EBA on the EU sugar regime in 2000, concluding that sugar imports could increase by an additional 2.4 million tons and cost the EU budget about 1.05 billion euros. These imports would have to be offset by reduced domestic production quotas or used for ethanol (European Commission 2003).

A longer-term threat to the EU sugar program is the Commission's plan to offer, all 77 ACP

countries the same conditions as the EBA countries under the Economic Partnership Agreements (EPAs). Negotiations, begun in September 2002, are expected to take five years. Under the EPAs, all ACP countries would have duty-free access to the EU market for all goods except arms. These countries currently produce 6.2 million tons of sugar. They could provide all of it to the European Union on short notice while covering their own demand from the world market. Taken together, EBA and ACP supplies could total 8.6 million tons. This is 60 percent of current EU production and would force major changes to the EU sugar program.

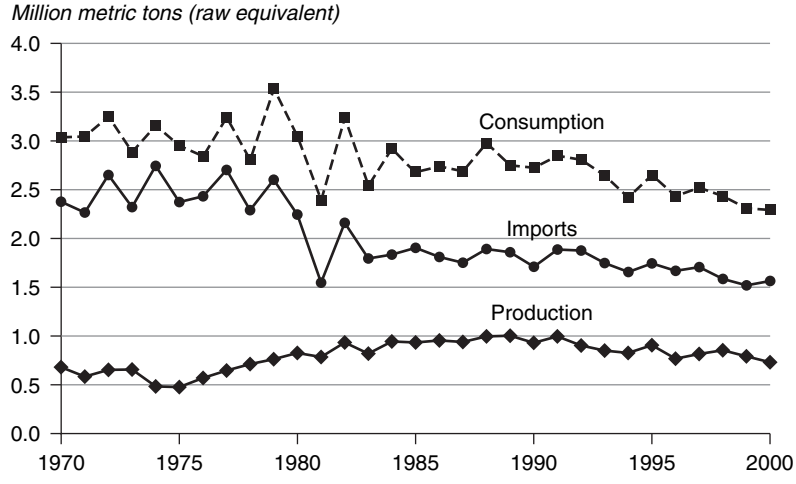
Enlargement of the European Union may also create new problems for its sugar regime. The 10 countries that joined in mid-2004 were Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia. Bulgaria and Romania will likely join in the next several years; the last of the current round of accession countries, Turkey, may join several years later. Poland is the largest sugar producer of the 10 countries that joined in 2004, with nearly 60 percent of the group's total production. The first 10 accession countries produce about one-fifth as much sugar as the European Union, have higher per capita consumption, lower yields, and lower recovery rates than the European Union. They agreed to an A and B quota of 2.958 million tons, with 2.829 million tons of A quota and 0.129 million tons of B quota (European Commission 2003). Acceding producers will likely also produce C sugar, as is done by current EU producers, and export it at world market prices. A 1998 EU Commission study of the 10 accession countries concluded that the group would add at least 200,000 tons to the European Union's export surplus.

The current EU sugar regime runs until June 2006, and the European Commission opened discussions on reform on September 23, 2003. However, unlike the other commodities scheduled for reform discussions—cotton, olive oil, and tobacco—specific reform proposals were not offered for sugar. Instead, three scenarios for reform were offered, ranging from an extension of the current sugar regime beyond 2006 to complete liberalization of the current regime. Complicating the reform discussions is an investigation launched by the WTO in August 2003 in response to the complaint by Australia, Brazil, and Thailand that the EU sugar regime illegally subsidizes the industry and depresses world prices. A negative finding against the EU by the WTO dispute-settlement body could force changes to the EU sugar regime.

Japan's Sugar Policy

Japan is the third-largest net sugar importer, after Russia and Indonesia, with average annual net imports of about 1.6 million tons of raw sugar during 1999–2001 (figure 8.4). Imports supply about two-thirds of domestic consumption; the remaining one-third is supplied by highly subsidized beet and cane production. Domestically produced

FIGURE 8.4 Japanese Sugar Trends, 1970–2000



Source: FAOSTAT.

HFCS accounts for about 40 percent of total caloric sweeteners. The government intervenes in the sugar market by establishing guaranteed minimum prices for sugar beets and cane, controls on raw sugar imports, prohibitive duties on refined sugar imports, high tariffs on imported products containing sugar, and quotas, tariffs, and other controls on sugar substitutes. The system results in retail sugar prices that are among the highest in the world ($.89 per pound in Tokyo in 2000) and producer prices for sugar beets and sugar cane that are roughly 10 times world market levels. Sugar consumption is gradually declining due to competition from HFCS, high sugar prices, slow economic growth, and dietary changes away from sweeteners. Consumption may actually be higher than reported, however, because sugar contained in imported products is not reported and is estimated to account for as much as an additional 10 percent of sugar consumption.

Japan's Ministry of Agriculture, Forestry, and Fisheries (MAFF) sets guaranteed minimum prices for sugar cane and sugar beets according to the Sugar Price Stabilization Law of 1965 and the Revised Sugar Price Adjustment Law of 2000 (Fukuda, Dyck, and Stout 2002). The minimum producer prices are set based on a formula comparing current agricultural input prices and consumer goods relative to prices that prevailed in 1950 and 1951. The minimum producer price for sugar beets during 1990–95 averaged $149 per ton, while the minimum producer price for sugar cane was $174 per ton. By comparison, U.S. sugar beet and cane producers received an average of $29 and $40 per ton, respectively, during the same period. Thus Japanese beet and cane producers received at least 10 times the world market prices.[3] For the 2001 marketing year, the minimum price was 17,040 yen per ton ($131 per ton) for sugar beets and 20,370 yen per ton for sugar cane ($157 per ton). Australian sugar cane producers, which receive no government price supports, received $16 per ton in the 2001 marketing year (Sheales 2002). The MAFF also sets the raw sugar price for domestic refiners, known as the "domestic sugar rationalization target price," at a level intended to allow restructured sugar refining firms to pay the guaranteed minimum price to sugar cane and beet producers and still recover costs. A subsidy is provided to sugar refiners to cover the difference between the domestic market price and the "target price." In marketing year 2001, the target price for raw sugar was 151,800 yen per ton ($1,168 per ton or $0.53 per pound), while the resale price on imported raw cane sugar was about $0.22 per pound (Fukuda, Dyck, and Stout 2002). The difference was made up by a subsidy financed by a surcharge on imported sugar, other surcharges, and funds from Japan's national budget. The current subsidy to refiners is 90 billion yen ($692 million) (Fukuda, Dyck, and Stout 2002). The government regulates the production and price of HFCS to limit competition with sugar and obtain funds to partially pay for the high support to sugar beet and cane producers.

Full liberalization of Japan's sugar and sweetener market would likely reduce domestic sugar production drastically—perhaps completely eliminating domestic production. Consumption would increase as consumers faced lower sugar prices. Imports would increase to meet consumer demand. HFCS consumption would likely increase without current controls but would not necessarily increase under full liberalization of the sugar and sweetener markets because of competition from imported sugar. The Australian Bureau of Agriculture and Resource Economics (see Sheales and others 1999) estimated that sugar imports would rise by 500,000 tons if Japan eliminated its tariffs, surcharges, and levies on sugar imports. The study assumed that domestic production would decline by just 22 percent because of other means of government support—this is probably an underestimate. The Economic Research Service of the U.S. Department of Agriculture (USDA) estimated that production would decline by 40 percent if Japan were to eliminate all border protection and trade-distorting domestic support. Consumer and producer prices in Japan would fall by 70 percent under the scenario, and imports would rise by as much as 735,000 tons (Fukuda, Dyck, and Stout 2002). Borrell and Pearce (1999) estimated that sugar prices would decline by 65 percent, production would decline by 44 percent, and net imports would increase by about 1.5 million tons.

The United States' Sugar Policy

U.S. sugar policy provides for a loan program for sugar beets and cane.[4] The nonrecourse loan program is reauthorized through fiscal 2007 at 18 cents

per pound for raw cane sugar and 22.9 cents per pound for refined beet sugar. A Refined Sugar Reexport Program allows sugar cane refiners to purchase raw sugar at world prices, without duty, and export a like amount within 90 days. A similar program exists for manufacturers of sugar-containing products. A no-cost provision of the policy requires the secretary of agriculture to make every effort to operate the sugar program in a way that avoids forfeiture under the loan program. To avoid forfeitures, it is necessary to keep the domestic sugar price above the world market price. This is done by restricting sugar imports, first by quotas introduced in May 1982, and then by tariff rate quotas beginning in 1990 following a successful GATT (General Agreement on Tariffs and Trade) challenge.

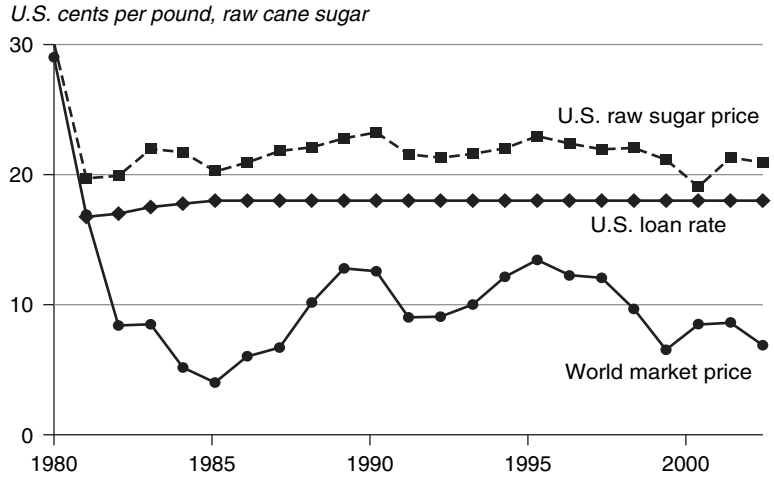
Minimum import levels were approved in 1990 to allay concerns of quota-holding countries and cane processors. It provided for marketing allotments on domestically produced sugar if estimated imports were less than 1.25 million tons, raw value. The secretary of agriculture has the authority to impose marketing allotments in order to balance markets, avoid forfeitures, and comply with the U.S. sugar-import commitments under WTO and NAFTA. The allotments can be used only when sugar imports, excluding imports under the reexport program, are less than 1.532 million tons.[5] The USDA announced flexible marketing allotments for sugar for the 2002–03 marketing year (Haley and Suarez 2002).

In the Uruguay Round Agreement on Agriculture (URAA), the United States agreed to maintain minimum imports of 1.139 million metric tons of raw-value sugar imports (1.256 short tons). Of this, 22,000 metric tons were reserved for refined sugar. The tariff rate quota on raw cane sugar was allocated to 40 quota-holding countries based on their export shares during 1975–81, when trade was relatively unrestricted. The duty of 0.625 cents per pound, raw value, continues on quota imports. Most countries continue to avoid the duty because of programs under the Generalized System of Preferences and the Caribbean Basin Initiative. The duty on raw sugar above the tariff rate quota was 17.62 cents per pound beginning in January 1995 and declined by 0.45 cents per pound each year until it reached 15.36 cents per pound in 2000. The over-quota rate for refined sugar was 18.62 cents per pound in 1995 and declined by 0.48 per year through 2000 to 16.21 cents per pound. The over-quota tariff will remain prohibitive at a world price of about 5 cents per pound (assuming a U.S. raw sugar market price of 22 cents per pound and a transportation cost of 1.5 cents per pound).

Under NAFTA most trade barriers between Canada, Mexico, and the United States were to be eliminated by 2009. As described previously, the treaty's sugar provisions were altered by a side-letter agreement prior to the start of NAFTA. But the side-letter agreement did not change other NAFTA provisions—such as the phased reduction in the United States over-quota tariff of 16 cents per pound by a total of 15 percent during the first six years, and then in a straight line to zero in calendar year 2008. The over-quota tariff on raw sugar, 7.6 cents per pound in 2003, drops about 1.5 cents per pound each year. If the world raw sugar prices are in the range of 7 cents per pound, and U.S. raw sugar prices are about 18 cents per pound, Mexican producers would benefit from exporting to the United States instead of to the world market (USDA 2002). Currently, Mexico does not have a large surplus of sugar to export, but increased production or reduced consumption could change that. In future years, the over-quota tariff will continue to decrease and could lead to large imports. A provision of the U.S. sugar legislation removes production quotas if imports exceed 1.5 million tons—a free-for-all if imports increase beyond certain limits. Under this alternative, the U.S. government could end up holding large stocks defaulted under the sugar loan program, and the sugar system would become more difficult to manage because of the no-net-cost provision. Mexico has increased sugar production from about 3.5 million tons during 1989–91 to 5.2 million during 2000–02, while consumption has increased from 4.0 to 4.5 million tons. Following the end of the NAFTA phase-in period, Mexico can ship unlimited quantities of sugar to the United States duty-free without the condition of being a net surplus producer. This will likely force changes to the U.S. sugar program. For example, Mexico could increase imports of HFCS for use in the soft drink industry, freeing sugar for export to the United States.

The effectiveness of the U.S. sugar program at keeping domestic prices above world prices since 1980 can be seen in figure 8.5. During this period, world prices have fallen sharply, but U.S. producers

FIGURE 8.5 U.S. Sugar Loan Rates, U.S. Prices, and World Prices, 1980–2002



Source: USDA.

were protected. The sugar program, however, faces new challenges in the near future that could bring into conflict the no-cost provision of the sugar program, the minimum import commitment under the WTO, and the duty-free access provision to Mexican imports in 2009. The rapid growth of sweetener production compared with consumption could also destabilize the program. The growth rate of sweetener production during 1985–2000 was 3.2 percent, compared with consumption growth of 2.1 percent over the same period. If these growth rates are extended into the future, marketing allotments would be needed to prevent stock building. The problem is further exacerbated by the agreement under the URAA to import 1.139 million tons of sugar per year.

The U.S. sugar program, like that of the European Union, almost certainly will have to change. But although it benefits just 9,000 sugar beet producers and 1,000 sugar cane producers (Orden 2003), opposition to policy reform is strong, especially from sugar-cane producers, who average nearly 3,000 acres per producer (compared with 200 acres per beet producer). Florida accounts for one-quarter of U.S. sugar production, and two large corporations account for nearly 80 percent of the cane acreage in Florida. Such concentration of production suggests that reforming the U.S. sugar program will likely require compensation to existing producers.

A model to consider is the recent reform of the U.S. edible peanut program (Orden 2003). Under that program domestic prices were supported at about double world prices, with quotas to limit production and tariff rate quotas to limit imports (see Diop, Beghin, and Sewadeh in this volume). And, like sugar, the edible peanut program faced the threat of increased imports due under WTO agreements and NAFTA. In the 2002 U.S. Farm Bill, the loan rate for edible peanuts was cut by half, compared with the mid-1990s, production quotas were eliminated, and direct cash payments were made to producers. The payments consisted of deficiency payments if prices fell below the new lower loan rates, decoupled direct payments, and countercyclical payments. In addition, quota holders were compensated with direct payments for their loss of quota rights. A similar program for sugar would be complicated by the loss of benefits by HFCS producers, who benefit from high sugar prices. Reform of the sugar program may also require compensating the industries that now depend on distorted sugar policies.

Conclusions

Sugar cane is an almost ideal commodity for some developing countries to grow for domestic consumption and export. It can be produced efficiently in tropical climates under a wide range of technologies, from low-input labor-intensive to high-input fully mechanized. Sugar is locally consumed in all producing countries and provides a substantial part of total calories in many countries. Processing

can be varied to meet the needs of low-income domestic or high-income foreign consumers. Raw cane sugar stores well after initial processing. There are few problems in meeting sanitary and health standards because sugar cane juice is boiled during initial processing and raw cane sugar is boiled again when refined to produce white sugar. The biggest problems for producers are limited export opportunities and low world prices—caused partly by policies in OECD countries.

Support for current OECD sugar policies among beneficiaries is obviously strong, but problems are emerging that make change inevitable. The benefits of sugar policy reform are substantial, and the gains are greatest under multilateral reform. According to recent studies of the global sugar and sweetener markets, the global welfare gains of removing all trade distortions and domestic support are estimated to total as much as $4.7 billion per year. In countries with the highest protection (Europe, Indonesia, Japan, and the United States), net imports would increase by 15 million tons per year. World sugar prices would increase about 40 percent, while sugar prices in countries that heavily protect their markets would decline. The greatest price decline would occur in Japan, where sugar prices would fall 65 percent, followed by a 40 percent decline in Western Europe and a 25 percent decline in the United States. Brazilian producers would gain the most from liberalization, around $2.6 billion per year, offset by a loss of $1 billion to Brazilian consumers who would pay higher prices under liberalization. Employment in developing countries would increase by approximately 1 million workers if the 15 million ton increase in net imports that accompanied the removal of all trade distortions and domestic support were supplied by developing countries.

The exporting countries that currently have preferential access to European and U.S. sugar markets gain about $0.8 billion per year through prices that are more than double world market price. The value of the preference is less than it appears, however, because many of these protected producers have high production costs and would not produce at world market prices. Further, world market prices would rise by about 40 percent after full multilateral liberalization, partially offsetting the loss to producers of high prices in preferential markets. The net loss to these exporting countries from full liberalization is estimated to total $0.45 billion per year.

The nature of reforms can have very different consequences for developing countries. If existing EU and U.S. polices are adjusted to accommodate higher imports from countries in the EBA and NAFTA systems, low-cost producers such as Brazil will lose. Full multilateral liberalization of the world sugar market would allow efficient producers to expand production and exports, thereby benefiting consumers in protected markets. Coordinated multilateral liberalization also offers the advantage of somewhat higher world prices to soften the adjustment for producers in protected markets such as the European Union, Japan, and the United States.

Notes

1. Brazil's policies on ethanol indirectly affect sugar, but the government provides no direct subsidies to sugar producers. Other small sugar producers that produce at world market prices include Canada and Malaysia.

2. An additional 1.8 million tons of sugar is imported under the sugar protocol between the EU and the member countries of ACP (Africa, the Caribbean, and the Pacific) and reexported with subsidy after processing.

3. There appears to be an anomaly between the OECD's estimate of producer support in table 8.4 and the prices received by sugar beet and sugar cane producers in Japan. If sugar beet and cane producers in Japan receive five times the prices in the United States, then it appears the Producer Support Estimate (PSE) in percentage form should be higher rather than lower as reported in table 8.4.

4. Nonrecourse commodity loans are used by the government to support prices of many crops. Under the program, farmers who comply with the provisions of each commodity program are allowed to pledge their commodity as collateral and obtain a loan from the USDA's Commodity Credit Corporation at the specified loan rate per unit for the commodity. The borrower may elect to repay the loan with interest within a specified period and regain control of the commodity, or default on the loan as payment of the loan and interest. The farmer will normally default on the loan if the market price is below the level necessary to repay the loan and interest. Thus, the loan rate becomes the effective floor price.

5. This seems the opposite of what is required, but the logic is apparently that if imports exceed this amount then the sugar program has lost its ability to control imports and U.S. producers should be given unrestricted freedom to produce.

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