U.S. sugar exports are forecast at 465,000 metric tons in 1994/95, largely composed of refined sugar that was imported raw at the world price under the Refined Sugar Re-Export Program. Cuba, once the world's dominant exporter, is forecast to export 2.5 million metric tons in 1994/95, far below the EU's 5.09 million (fig. 31, table 7).

Australia is forecast to export 3.8 million metric tons in 1994/95, ahead of Cuba to second place in world rankings (first if EU countries are counted separately). Thailand's exporting capacity has risen rapidly over the last 2 decades, and Thailand is now consistently among the world's top exporters. Brazil is still a steady exporter, even though over half of its sugarcane is used to produce fuel ethanol, and 1994/95 exports are forecast at 2.8 million metric tons. Much of China's export business is from imports of raw sugar, which are refined for re-export. In 1994/95, China will be a net importer after several years as a net exporter. Unless China acts to impose policies which raise sugar prices, prospects are for China's consumption to outpace production in the rest of the century.

Prospects for the World Sugar Market

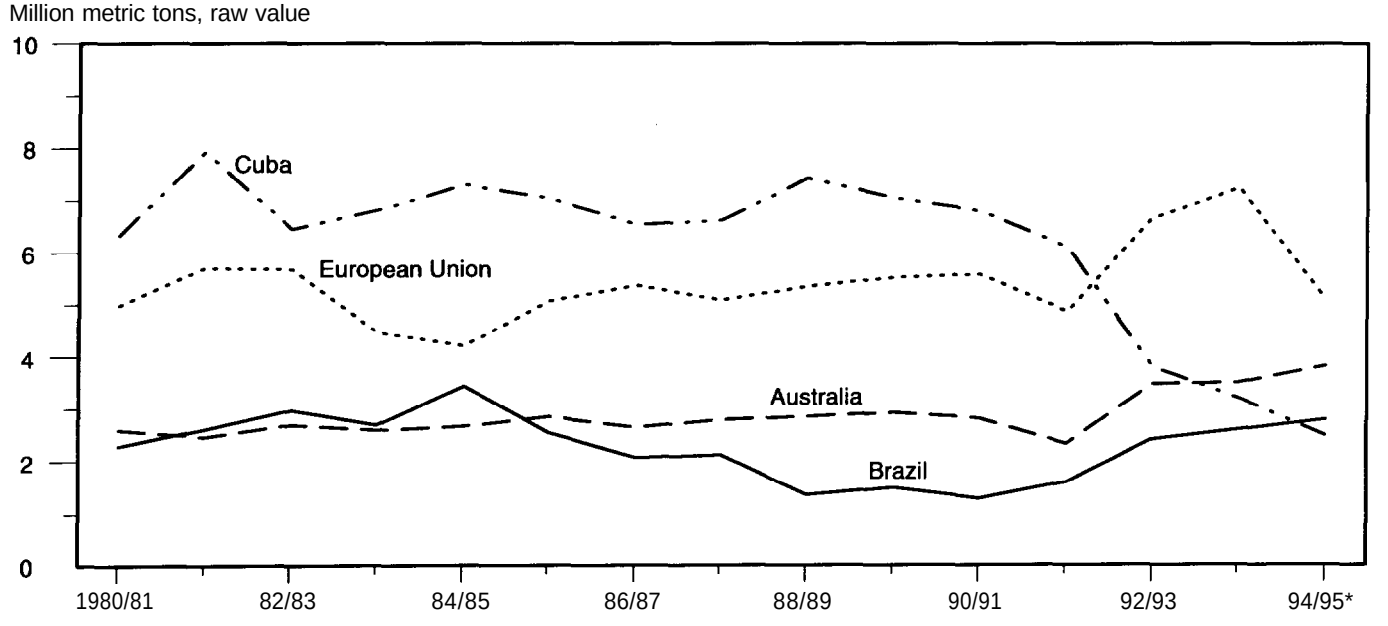
The world sugar market is often characterized as a "residual" market. After World War II, the world sugar market generally had the following characteristics:

Table 7—World sugar trade, by leading sugar exporters and importers

Country or area	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
						Million metric tons, raw value					
Sugar exporters:											
Cuba	7.3	7.05	6.53	6.62	7.44	7.07	6.80	6.10	3.80	3.20	2.50
European Union[1]	4.3	5.08	5.38	5.10	5.36	5.51	5.58	4.87	5.65	6.41	5.09
Ukraine	NA	NA	NA	NA	NA	NA	3.45	1.50	2.00	1.80	1.90
Australia	2.7	2.86	2.66	2.80	2.86	2.93	2.82	2.35	3.48	3.49	3.82
Thailand	1.8	2.06	1.96	1.89	3.00	2.61	2.74	3.66	2.33	3.00	3.30
Brazil	3.4	2.56	2.09	2.13	1.37	1.50	1.30	1.61	2.43	2.56	2.80
China	0.1	0.27	0.46	0.31	0.28	0.62	0.3	1.42	2.10	1.05	0.30
Total leading exporters	19.70	19.88	19.08	18.85	20.31	20.24	22.69	21.51	21.79	21.51	19.71
World total	28.97	28.87	27.46	27.08	28.67	28.65	32.54	30.77	29.55	29.73	27.87
						Percent					
Leading exporter's share of global exports	68	69	69	70	71	71	70	70	74	72	71
						Million metric tons, raw value					
Sugar importers:											
Russian Federation	NA	NA	NA	NA	NA	4.55	3.58	3.85	3.50	3.15	3.10
European Union[1]	2.3	2.26	2.21	2.21	2.43	2.23	1.88	1.89	2.01	2.00	2.01
United States[2]	2.1	2.05	1.50	1.14	1.75	2.35	2.62	2.07	1.83	1.60	1.67
Japan	1.9	1.86	1.70	1.85	1.91	1.79	1.76	1.80	1.77	1.63	1.62
China	1.9	1.22	1.51	3.70	2.48	1.13	1.06	1.23	0.51	0.68	1.50
Canada	1.1	1.15	1.12	0.93	0.71	0.82	1.11	0.96	1.01	1.21	1.21
Korea, Republic of	0.9	0.97	1.10	1.11	1.11	1.11	1.23	1.26	1.23	1.26	1.24
Total leading importers	10.07	9.51	9.14	10.94	10.37	13.98	13.24	13.06	11.85	11.52	12.35
World total	29	29	27	27	29	29	33	31	30	30	28
						Percent					
Leading importer's share of global imports	35	33	33	40	36	49	41	42	40	39	44

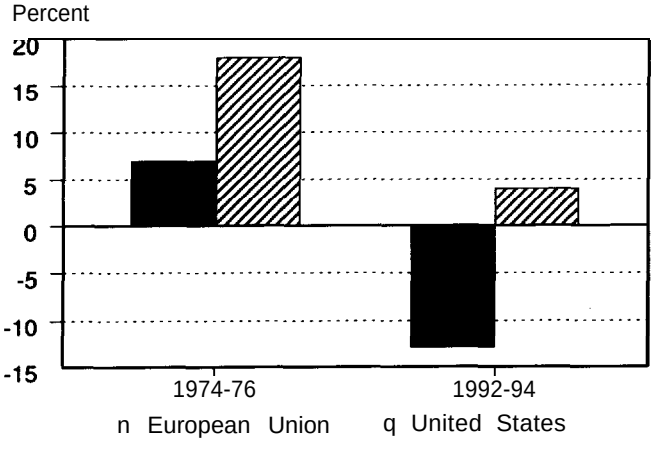
NA = Not available.
[1]Excludes intra-EU trade, includes Unified Germany. Does not include Finland, Austria, and Sweden.
[2]Based on offshore receipts and includes sugar imports for re-export.
Source: USDA, Foreign Agricultural Service.

Figure 31
Exports by selected countries



*Forecast.
Source: USDA.

Figure32
U.S. and EU net imports as share of total world imports 1/



1/ Net imports defined as total imports minus total exports: if negative, country is a net exporter.
Source: USDA.

- Occasional sharp price "spikes" of short duration were followed by longer periods of relatively low prices (fig. 23).
- The largest share of world imports was purchased by industrialized countries.
- There were few substitutes for sugar, and thus price increases did not significantly dampen demand, especially among high-income buyers.
- Producers in many countries were shielded from low world prices, but not from price spikes: i.e., many producers received prices above the world price.

But over the last two decades, world sugar market conditions have changed dramatically.

- There are more substitutes than before. Partly spurred by technological advances, world HFCS production rose from almost zero before 1975 to almost 9 million metric tons in 1994, and consumption of low-calorie (high-intensity) sweeteners increased considerably.
- The bulk of import demand is no longer from high-income, price-insensitive countries but from price-responsive lower-income countries.
- Policy reforms or changes have occurred in many countries, and more producers and/or consumers now face the world price.

Past world sugar price spikes (prices above 20 cents a pound) would often lead to expanded sugar production all over the world. The higher production would result, a few years later, in lower prices.

The world sugar price has historically been volatile; for example, it was twice as variable as the world wheat price from 1960 to 1980 (fig. 33).[3] However, the variability of the world sugar price has dropped considerably, even though it remains more volatile than some other commodity prices. Since the world price rose above 8 cents a pound in 1986, and the world ending stocks/use ratio fell below 21 percent (fig. 34, table 6). the world price has traded between 8 and 16 cents a pound.

At one time, a large share of world sugar imports was made under special, or fixed-price, agreements, and the amount of sugar that actually traded at the world price was significantly less than total world trade. For example, the arrangement by which the former Soviet Union paid a premium price to Cuba, from the 1960's until 1991, typically involved about 4 million metric tons of sugar. Since 1992, the republics of the former Soviet Union have stopped paying a premium price for Cuban sugar. Those republics which continue to import Cuban sugar, in particular the Russian Federation, now pay the world price (even if expressed in barter terms).

But in 1995, the only significant special import arrangements remaining are the U.S. and EU import quotas, which together account for about 3 million metric tons, about 10 percent of world sugar trade, or about 20 percent of raw sugar trade. The remaining 90 percent of world imports are traded at the world price, though of course, many governments still shield producers from the world price. The share of total world production that is traded on world markets is far higher for sugar (26 percent) than for commodities such as wheat (18 percent), corn (12 percent), or rice (3 percent).

Over the last decade, countries such as Brazil, Mexico, Argentina, Venezuela, Jamaica, and many republics of the former Soviet Union have embarked on programs to privatize sugar industries. Australia has significantly reduced internal regulations and reduced import tariffs. The declining variability of the world sugar price reflects these and other similar policy changes around the world.

U.S. Sugar Policy

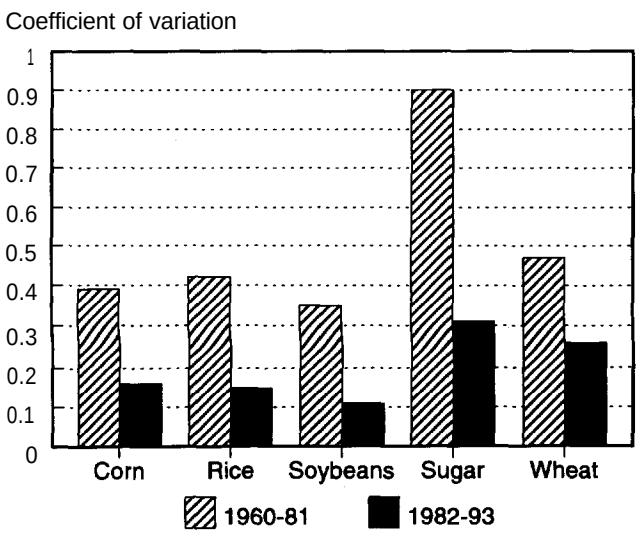
U.S. sugar policy can be divided into three distinct periods. During 1934-74, the Government maintained comprehensive control of the sugar industry. During 1974-81, there was less Federal involvement. Since 1981, government control of the sugar market has consisted primarily of a nonrecourse loan program, import quotas, and marketing allotments.

Historical Perspective of U.S. Sugar Legislation

The Sugar Act of 1934 initiated 40 years of extensive government regulation of the sugar industry. The law

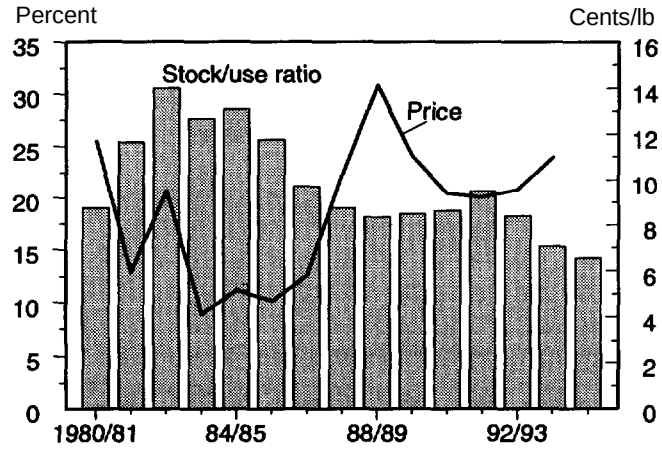
[3]Variability is measured by the coefficient of variation of annual prices. The coefficient of variation is the standard deviation divided by the mean.

Figure 33
Variability of world prices for major commodities



Source: USDA, Economic Research Service.

Figure 34
World sugar price and stock/use ratio 1/



September-August price, No. 11 contract.
1/ End-of-year stocks weighted mainly with countries with September/August marketing years.
Source: USDA.

Nonrecourse Loans: A Basic Tool of Current Sugar Policy

Nonrecourse loans are the major price support instrument used by USDA's Commodity Credit Corporation (CCC) to support the price of sugar, wheat, feed grains, oilseeds, cotton, peanuts, tobacco, and rice. Farmers or processors who agree to comply with each commodity program provision may pledge a quantity of a commodity as collateral and obtain a loan from the CCC. Borrowers receive the established price per unit (pound, bushel, bale, or hundredweight) known as the loan rate.

Unlike other commodity programs, sugar loans are made to processors and not directly to producers. This is because sugarcane and sugar beets, being bulky and very perishable, must be processed into sugar before they can be traded and stored.

To qualify for loans, a processor must agree to pay producers the USDA-established minimum price support levels based on the loan rates for sugarcane and sugar beets. Growers generally receive about 60 percent of the loan or sale proceeds of the sugar and processors 40 percent, but the exact arrangements vary by contract and the quality of the crop.

If the sugar processor does not take out a nonrecourse loan, then the farmer delivering sugar beet or sugarcane to the processor does not, technically, have price support through the loan program.

The borrower may elect to repay the loan with interest within a specified period and regain control of the collateral commodity, or default on the loan. In case of a default, the borrower forfeits without penalty the collateral commodity to the CCC. The loans are nonrecourse because the Government has no option (or recourse) but to accept forfeiture as full satisfaction of the loan obligation, including the accumulated interest, regardless of the price of the commodity in the market at the time of default. The processor will be inclined not to default if the market price for sugar is high enough to permit repayment of the loan, interest, freight, and related marketing expenses. (Freight is not part of the formula for beet sugar because the buyer pays the freight.)

required the Secretary of Agriculture to determine the consumption requirements for sugar in the United States each year and divide these requirements among domestic areas and foreign countries by assigning each a quota. The act also provided for (1) benefit payments to growers, (2) a processing tax on sugar, (3) minimum wage rates for fieldworkers, (4) child labor provisions, and (5) acreage restrictions. These basic provisions remained in effect through subsequent legislation until 1974. At that time, with record-high world sugar prices far exceeding the domestic price objective, Congress decided not to renew the Sugar Act. The introduction of HFCS in the early 1970's was also reshaping the sweetener industry.

Then in September 1976, with a growing sugar surplus and world prices below 9 cents a pound, Congress voted to include sugar support provisions in the Food and Agriculture Act of 1977. The 1977 and 1978 sugarcane and sugar beet crops were supported through loans and purchases (table 8). Processors were required to pay growers at least the support prices specified by the program for average-quality sugar beets and sugarcane as long as the growers met USDA minimum wages for fieldworkers. To provide incentive for processors to sell their sugar in the marketplace rather than forfeit it to the Commodity Credit Corporation (CCC), import duties and fees were used to maintain the domestic sugar price at the market price objective.

A sugar loan program was adopted for the 1979 crop under title III, section 301, of the Agricultural Act of 1949 (known as the "permanent legislation"). The 1949 Act gives the President discretionary authority to make available price support at up to 90 percent of parity through loans, purchases, and other operations. No support program was provided for the 1980 and most of 1981 sugar crops because world and U.S. market prices were relatively high.

By 1981, several factors were influencing the debate on U.S. sugar policy. The development of HFCS in the 1970's added corn growers and corn sweetener producers to those concerned about sweetener prices. As a result, sugar support was included in the omnibus farm bill rather than specific sugar legislation.

Cost of production studies published by the USDA in 1981 estimated the total economic costs of producing refined beet sugar at about 24 cents a pound, and raw cane sugar at about 25 cents a pound. Assuming that inflation would continue at 7 percent a year, some analysts at the time estimated sugar costs of production

would rise to over 35 cents a pound in 1985. (For the 1992 crop, total costs are estimated at 22 cents a pound for refined beet sugar, and 19.9 cents a pound for raw cane sugar.)

Congress voted to support the domestic sugar industry by providing a nonrecourse loan program for sugar under the Food and Agriculture Act of 1981. In part due to assumptions about inflation prospects, Congress mandated increases in the loan rate over 4 years to 18 cents by the 1985 crop, 38 percent higher than the 13-cent level of the 1979 crop. Loan rates differed by location so that loans would not distort the routine marketing of sugar.

For a time, a market stabilization price (MSP) was used as a guide to establish a price for raw cane sugar above the loan rate. The MSP was considered to be the minimum market price required to discourage sale or forfeiture of any sugar to the CCC. The difference between the loan rate and the MSP covered all transportation costs, the interest required to redeem a loan, and an incentive factor to encourage processors to sell rather than forfeit sugar. The MSP was last announced in September 1989 at 21.95 cents a pound for raw sugar.

Other Legislative Authorities To Support the U.S. Sugar Industry

Sugar Import Quotas

While sugar import quotas are not technically part of the domestic sugar support legislation, they are integral in overall sugar policy. Without the quota, low-priced sugar in the world market would be free to enter the U.S. market. Extensive imports could depress domestic prices below the loan rate and result in large forfeitures of sugar to the CCC. In response to this threat, a sugar import quota system was implemented in May 1982. Subsequent to a successful GATT challenge in 1990, a tariff-rate quota replaced the previous absolute quota system, with the same general goal: to maintain prices at levels that prevent forfeiture of CCC loans.

Table 8-U.S. national average cane and beet sugar loan rates

Fiscal year	Raw cane sugar loan rate	Beet/cane returns ratio[1]	Fixed marketing expenses[2]	Refined beet sugar loan rate	Ratio, beat to cane loan rate
	Cents/lb	*Ratio*	*Cents/lb*		*Ratio*
1977/78	13.50	1.10	0.73	15.57	1.15
1978/79	14.73	1.10	0.80	16.99	1.15
1979/80	13.00	1.10	0.85	15.15	1.17
1980/81[3]	n.a.	n.a.	n.a.	n.a.	n.a.
1981/82[4]	16.75	1.13	0.77	19.70	1.18
1982/83	17.00	1.13	0.94	20.15	1.19
1983/84	17.50	1.13	1.08	20.86	1.19
1984/85	17.75	1.12	0.88	20.76	1.17
1985/86	18.00	1.12	0.90	21.06	1.17
1986/87	18.00	1.12	0.93	21.09	1.17
1987/88	18.00	1.12	1.00	21.16	1.18
1988/89	18.00	1.13	1.03	21.37	1.19
1989/90	18.00	1.13	1.20	21.54	1.20
1990/91	18.00	1.16	1.05	21.93	1.22
1991/92	18.00	1.21	1.07	22.85	1.27
1992/93	18.06	1.23	1.19	23.33	1.30
1993/94	18.00	1.25	1.12	23.62	1.31
1994/95[5]	18.00	1.23	1.29	23.43	1.30

n.a. = Not applicable.
[1]Prior to 1985/86, based on a 10-year weighted average of the ratio of the raw sugar price to the net returns for beet sugar. After 1985/86, calculated as the 10-year weighted average of beet-to-cane grower returns, on a cents-per-pound basis. Beginning 1991/92, is on basis of a 5-year weighted average ratio.
[2]Beet processor marketing expenses that would be incurred regardless of whether sugar is forfeited or not.
[3]No loan rate in effect.
[4]Purchase program in effect December 1981-May 1982 only.
[5]Announced January 26, 1995.
Source: USDA.

The Secretary of Agriculture is authorized to proclaim tariff-rate quota amounts under Additional U.S. Note 5, Chapter 17 of the Harmonized Tariff Schedule of the United States (HTSUS). That chapter fixes the rate of duty to countries granted Most-Favored-Nation status by the United States. The minimum duty is 0.625 cent a pound, raw value. Allocations of quotas under Additional Note 5 must be appropriate to carry out the rights and obligations of the United States under any international agreement to which the United States is party or be appropriate to promote the economic interests of the United States.

The Secretary of Agriculture is empowered to establish the overall quota amount, and the United States Trade Representative to allocate the quota among countries. The aggregate quota for raw cane sugar cannot be less than 1.117 million metric tons (1.23 million short tons), and not less than 22,000 metric tons (24,250 short tons) for refined sugar (defined as several types of sugars other than raw cane sugar).

Prior to January 1, 1995, both the quota level and the period to which it applied could be adjusted, based on estimated demand for sugar in the U.S. market and on domestic supplies. Under the new Uruguay Round GATT tariff schedule, beginning October 1, 1995, the quota period will be October l-September 30. Allocation of the quota to individual countries is based largely on their share of the U.S. market during 1975-81 when imports were relatively unrestricted. Quotas are currently extended to 40 countries (app. table 27). In 1995 Canada will be placed back on the list of quota-holding countries.

Section 22 Quotas

In the recent Uruguay Round GATT agreement, actions under Section 22 have been effectively eliminated by being converted to tariffs. Previously under Section 22 of the Agricultural Adjustment Act of 1933, the President had been empowered, on the basis of an investigation and report by the International Trade Commission (ITC), to regulate commodity imports whenever it was found that such imports tended to render ineffective or materially interfere with USDA's commodity price support or stabilization programs. This authority had permitted the imposition of fees not in excess of 50-percent ad valorem or quotas not in excess of 50 percent of the quantity imported during a representative period determined by the President. The only sugar fee imposed under Section 22 authority in 1994 was a 1-cent-per-pound fee on refined sugar imports which, effective January 1, 1995, has been combined with sugar duties in the Tariff Schedule.

As the world sugar price fell and the U.S. price rose in the early and mid-1980's, incentives to import products containing cheaper world-priced sugar increased. In response, the United States imposed quotas under Section 22 on various categories of products containing a large percentage of sugar, such as cocoa powder. These sugar-containing product quotas were separate from, and in addition to, the import quota on sugar. As of January 1, 1995, these quotas have been converted to tariff-rate quotas.

Other Sugar Supply Management Measures

To boost the ability of U.S. cane refiners to compete in world markets, USDA instituted the Refined Sugar Re-export Program in 1983. Under this Program, licensed refiners may purchase raw sugar at the world price as long as they export a like amount of refined sugar within 90 days. A similar program was created for manufacturers of sugar-containing products, who may purchase world-priced sugar as long as they can demonstrate the export of a like amount of sugar in products within 18 months.

Sugar Legislation: 1985-Present

The Food Security Act of 1985 largely continued the sugar provisions of the 1981 Act, and continued the minimum cane sugar loan rate at 18 cents a pound. Sugar forfeited to the CCC largely from the 1984 crop resulted in costs to the U.S. Treasury of about $105 million over fiscal years 1986-88. Partly as a result of these forfeitures, Congress inserted the no-cost provision into the 1985 Act, which required administrators of the sugar program to more strongly avoid forfeitures.

When consideration of the 1990 farm legislation began, falling U.S. sugar imports were central to the debate. Imports for consumption had dropped below 1 million tons in fiscal 1988, and U.S. sugar production had risen from about 6 million tons to over 7 million tons. Bad weather lowered U.S. production and raised imports back to almost 2 million tons in 1990, but renewed lower imports were forecast and cane refiners were concerned about access to raw sugar. Quota-holding countries were likewise concerned about the continued decline of sales to a market in which their sugar received a premium price.

Cane refiners and quota-holding countries supported a legislated minimum level of sugar imports. To control price, another supply control mechanism was needed once a floor was placed on imports, and thus

the 1990 Farm Act included the first domestic supply controls since 1974.

The 1990 Farm Act provides for marketing allotments on domestically produced sugar if "estimated sugar imports" are less than 1.25 million tons, raw value. The estimate is not actual imports of sugar, but the result of a formula. The Secretary of Agriculture calculates "estimated imports" for a fiscal year by adding estimated consumption and reasonable ending stocks and then subtracting domestic production and beginning stocks. The estimates must include Puerto Rico, and are recalculated quarterly. If allotments are announced, they apply to sugar marketed for a fiscal year, and to crystalline fructose at a level of 159,757 tons, though crystalline fructose is not included in the trigger formula.

If allotments are implemented, the Secretary sets the overall allotment quantity by adding consumption and reasonable ending stocks, and subtracting from that beginning stocks and 1.25 million short tons. The allotment is then allocated between beet and cane sugar based on three factors: past marketings, processing and refining capacity, and the ability to market. If either the beet or cane sector cannot fill its allocation, imports must fill the gap.

The same three factors are used to allocate the cane and beet sugar allotments among producers. In Louisiana, each sugarcane grower receives a proportionate share based on historical acreage; in all other cases, the allocations are only to processors. The legislation (as amended) provides for penalties to processors who knowingly exceed their allocations.

In September 1994, USDA calculated the allotment formula for fiscal year 1995 as follows.

Add:	
Consumption	9.247 million tons
Reasonable ending stocks	1.278 million tons
Subtract:	
Beginning stocks	1.386 million tons
Production	7.890 million tons
Equals:	
Marketing Allotment Import Estimate (MAIE)	1.249 million tons

Since estimated imports were below 1.250 million short tons, allotments were triggered for fiscal year 1995.

The basic support price level of 18 cents a pound for raw cane sugar was unchanged in the 1990 Farm Act. The legislation, however, mandated changes in the calculation of the loan rate for beet sugar.

In the 1985 Act, the beet sugar loan rate had been required to be "fair and reasonable" in relation to the cane sugar loan rate. During the 5 years of the Act, a two-step procedure was used to determine the beet loan rate. The first step was to multiply the cane sugar loan rate (18 cents) by the ratio of grower returns for refined beet sugar to grower returns for raw cane sugar, both on a cents-per-pound basis. The ratio was based on weighted national averages for the most recent 10-year period. The second step was to add fixed marketing expenses of beet sugar processors.

The 1990 Farm Act required that the period used to derive the ratio of sugar beet-to-sugarcane grower returns be reduced from 10 to 5 years. Since the ratio had been higher in recent years, the 5-year derivation effectively raised the ratio, and thus the beet sugar loan rate (fig. 35 and table 8). Each percentage increase in the ratio raises the beet loan rate by 0.18 cent a pound (1 percent of 18 cents). The ratio rose from 1.16 in fiscal 1991 to 1.23 in 1995. The beet loan rate also rises if fixed marketing expenses rise.

Because effective support levels for many crops other than sugar were reduced in the 1990 Farm Act, the Omnibus Budget Reconciliation Act of 1990 (P.L. 101-508) provided for an assessment on all sugar processed of 0.18 cent per pound of raw cane sugar and 0.193 cent per pound of refined beet sugar. Revenues from the assessments total $25-30 million annually. Legislation enacted in August 1993 (P.L. 103-66) increased the assessments on sugar by 10 percent beginning October 1, 1994, and extended the sugar provisions of the 1990 Farm Act through fiscal year 1998. Depending upon crop size, revenues will likely rise above $30 million annually.

Economic Effects of the Sugar Program

Groups affected by U.S. sugar policy include sugar producers and processors, consumers and users of sugar and products containing sugar, taxpayers, foreign suppliers of raw and refined sugar, manufacturers of sugar-containing products, cane sugar refiners, sugar brokers and traders, employees of sugar processing and refining firms, corn sweetener manufacturers, and possibly corn farmers. The effects change over time. For example, while foreign suppliers benefit from the higher price in the U.S. market, declining import quotas have reduced each quotaholder's shipments. Industry structure itself may also change because of the program, complicating the analysis of program effects.

While measuring the full effects of the sugar program is complex, the key element is the price premium provided in the U.S. market. The premium is higher or lower, based on an estimate of the world price in the absence of the U.S. sugar program. The premium could also be based on a estimate of what the world price would be in the absence of any trade-distorting policies worldwide. If, without the multitude of trade-distorting policies around the globe, the world price were as high or higher than the U.S. price, the premium could even be zero.

Most studies of the removal of sugar trade-distorting policies in the major industrialized nations project a world price at levels lower than the U.S. price. A USDA study estimated such a hypothetical world price 15 cents a pound (16.5 cents, New York basis)! During fiscal 1992-94, the U.S. raw sugar price averaged about 21.5 cents a pound. Based on this price gap, the premium would be 5 cents a pound, or $100 per ton of sugar, raw value. For each 1 cent price gap, the premium would be $20 per ton.

The following estimates are based on recent quantities and prices of sugar and do not account for how producers and consumers would change their behavior if prices were different. The estimates are very similar to analyses that account for reactions to price.

Producers and Processors

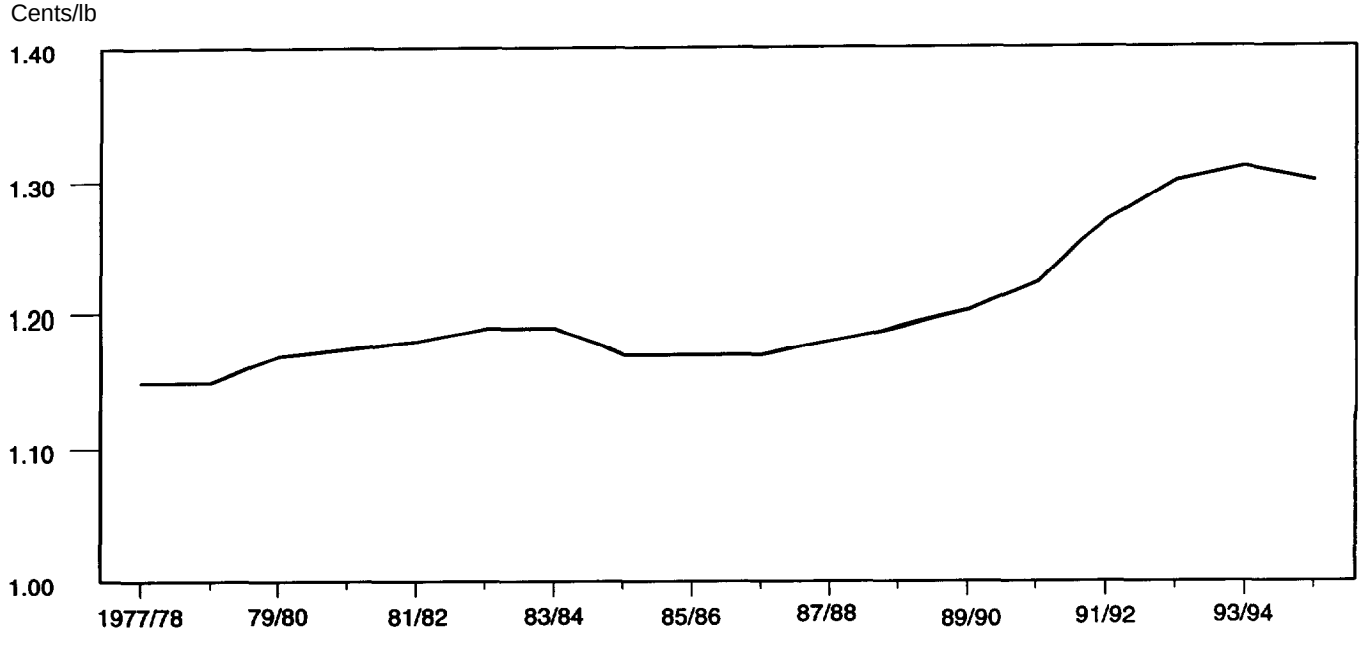
Producers and processors benefit from sugar policy through income and wealth effects. The higher U.S. price made possible by the sugar program directly raises the income of producers and processors through higher receipts from the sale of raw cane and beet sugar. Less obvious are the program's effects on the value of fixed assets such as capital and land used for sugar crops, specialized harvesting and processing equipment, and processing facilities.

U.S. sugar production averaged 7.5 million tons, raw value, in fiscal 1992-94. Thus if there were any premium attributable to the U.S. sugar program, for each 1-cent a pound ($20 a ton) industry revenues were raised by $150 million a year. Based on their typical 40 percent share of proceeds, processors received $60 million in program benefits. Cane and beet growers, who typically receive about 60 percent of revenues, received an estimated $90 million.

Beet sugar averaged 55 percent of total sugar production over 1992-94. Thus, the benefit to sugar beet growers for each 1-cent premium was $50 million, or $5,600 per farm, and for sugarcane growers a total of $40 million, or $39,000 per farm.

[4]See: Barry, Robert D., et al., *Sugar: Background for 1990 Farm Legislation;* Lord, Ron and Robert D. Barry, *The World Sugar Market-Government Intervention and Multilateral Policy Reform.*

Figure 35
Ratio of U.S. beet sugar loan rate to cane sugar loan rate



Source: USDA.

In addition to direct benefits, sugar policy also has numerous indirect benefits. For example, because the sugar program increases producer revenues, sugarcane and sugar beet acreage is more valuable. Input suppliers, such as manufacturers of specialized equipment and chemicals, also benefit from higher sales.

Consumers

During fiscal years 1992-94, domestic sugar consumption averaged 8.9 million tons a year, raw value. For each 1-cent-per-pound ($20-per-ton) premium, the cost to consumers would be $178 million. In addition, the price of HFCS is influenced by the price of sugar. Expenditures for HFCS undoubtedly would have been lower were the sugar price per pound 5 cents lower.

If HFCS did not exist, the consumer cost of the sugar program would be higher, since there would be no savings from consumption of a lower priced alternative. However, savings from the use of HFCS is only a reduction from what would have been a much higher cost of the sugar program. For example, if the 1992-94 average use of 7 million tons of HFCS had been sugar, at its higher price, sweetener expenditures would have been higher.

Foreign Suppliers

Countries that supply raw and refined sugar to the United States benefit from the premium U.S. price associated with a price support program. However, to the extent that a country pays an import duty and/or fee on sugar imports, the premium is reduced. Some countries, during a tight market, are able to pass part of the cost of the import duty and/or fee on to the buyer.

In fiscal years 1992-94, only five or six countries were subject to the import duty of 0.625 cent a pound: other quota suppliers were exempt through the Generalized System of Preferences or the Caribbean Basin Initiative. Based on average quota imports of 1.315 million tons, for each 1-cent-per-pound premium foreign suppliers received benefits of an estimated $26.3 million. This is much lower than benefits during the early 1980's when U.S. imports averaged over 3 million tons a year.

Cane Sugar Refiners

Most of the cane sugar consumed in the United States is refined from raw sugar. The refining companies also refine sugar for re-export.

The U.S. sugar program has contributed to the reduced volume of cane sugar in the U.S. market. The loss of the U.S. liquid sweetener market to HFCS was at the expense of imported sugar, which is almost entirely cane sugar.

Ten refineries have ceased operations since 1981 and refining capacity has declined 35 percent. Only 12 refineries remain, with an annual capacity of about 5.5 million tons of raw sugar. The increase in domestic cane sugar production as a result of the sugar program has only slightly offset the decline in raw sugar imports for refining. The interests of cane sugar refiners in U.S. sugar policy are complicated because some companies own beet and cane processing facilities, HFCS production facilities, and/or sugarcane acreage.

Corn Sweetener Manufacturers and Corn Growers

Corn sweetener, particularly HFCS manufacturers, benefit from the U.S. sugar program. The sugar program provides a price floor for sugar above the cost of producing liquid HFCS, and thus guarantees that sugar cannot be price-competitive with HFCS.

The sugar program's guarantee of a price floor for sugar (and thus indirectly HFCS) stimulated investment in HFCS facilities, and a more-rapid acquisition of share for HFCS in the U.S. sweetener market. Further, higher HFCS revenues have funded substantial research and development in the corn wet-milling industry, indirectly benefitting other products such as fuel ethanol.

Expansion of HFCS production has increased the demand for corn. The amount of corn used in HFCS production increased from 165 million bushels in 1981 to 440 million bushels in 1994. The amount of corn used in all corn sweeteners increased from 321 million bushels in 1981 to 660 million bushels in 1994. During 1992-94, about 8 percent of the U.S. corn crop was used by the wet milling industry to produce corn sweeteners.

Some have claimed savings from the sugar program due to a reduction in Treasury expenditures on corn deficiency payments: savings would occur if the corn price is raised by the sugar program. Although the HFCS industry uses 8 percent of U.S. corn production, it is not necessarily true that without the sugar program HFCS use would decline. The variable cost of HFCS production is estimated at 12 cents a pound or less, below the world price of refined sugar (usually about 4 cents higher than the raw sugar price). In 1994 and early 1995, HFCS producers have added, or announced plans to add, over 30 percent to existing capacity. With so much investment in fixed capacity either in place or under construction, HFCS producers would likely maintain their market share regardless of

U.S. sugar policy and price. In the short run, even if U.S. sugar prices fell to world levels, HFCS would keep its market share, corn prices would not likely be affected, and there would be little or no reduction in Treasury expenditures on corn deficiency payments. If sugar prices remained low in the long run, further investment in HFCS expansion might be curbed, and sugar might regain some liquid sugar markets.

Taxpayers

The impacts of the sugar program on taxpayers are minimal, since the sugar program's benefits are received through the market price and not through direct payments. The Government receives interest on the nonrecourse CCC loans, and the interest rate for these loans is based upon the estimated cost to the Treasury of 1-year securities. But since the CCC interest rate is well below the prime rate, which is usually the lowest commercial interest rate usually available for large borrowers, nonrecourse loans provide a subsidy to processors and likely take business away from other banks.

Processors pay about $25-30 million per year from the assessment on sugar marketings, and some revenues, about $5 million per year, are collected from import duties. Within-quota duties may be eligible for drawback (returned to payee) if sugar is subsequently exported. Some sugar was forfeited in fiscal 1994. Some of the forfeited sugar was sold at a slight gain, and some remains to be sold.

Effects of GATT and NAFTA on the Sugar Sector

The Uruguay Round GATT Agreement

The Uruguay Round (UR) GATT agreement brings agriculture, including sugar, under world trading rules for the first time. Of the three major areas of reform, only tariff reduction will affect U.S. sugar policies.

Current domestic support and minimum import access provisions of U.S. sugar policy are already consistent with UR provisions. As a result, the UR will have little impact on U.S. sugar price. The UR is likely to raise the world price by 2-5 percent by the year 2000, largely because of worldwide income gains which will increase sugar consumption. However, this small increase in the world price is not likely to have much impact on the U.S. sugar market.

In the UR, the United States agreed to maintain (in GATT parlance, "bind") a minimum annual low-duty import level of 1.139 million metric tons, raw value (1.256 million short tons), a level similar to the minimum estimated import level provided for in the 1990 Farm Act. Of the total, 22,000 metric tons will be reserved for refined sugar. The current low duty of 0.625 cent a pound, raw value, will continue to apply to quota imports, the level of which is to be determined by the Secretary of Agriculture. Most countries will still have the low duty waived under either the GSP or the CBI program.

The high duty on raw sugar applies to sugar imports above the tariff-rate quota level. Beginning January 1, 1995, the high duty is 17.62 cents a pound, and will be lowered about 0.46 cent each year until it reaches 15.36 cents a pound in the year 2000.

Section 22 quotas on sugar-containing products have been converted to tariff-rate quotas, with low-tariff quota amounts set at approximately the same levels as the previous quotas. The new tariffs on over-quota amounts are based on 1986-88 tariff-equivalents, and will be lowered by 15 percent over 6 years, Most of these over-quota tariffs will probably remain prohibitive. By the year 2000, the U.S. tariff of 15.36 cents a pound, given transportation costs of 1.5 cents, would protect a U.S. raw sugar market price of 22 cents a pound at a world price above 5 cents a pound.

NAFTA

The North American Free Trade Agreement (NAFTA) became effective on January 1, 1994, and will eliminate most trade barriers between Canada, Mexico, and the United States over the next 15 years. NAFTA does not address sugar trade between the United States and Canada.

For purposes relating to access to the other country's sugar market, a formula defines "net surplus production" at roughly equal to projected sugar production minus projected domestic consumption. If this formula yields a positive number, the country is a net surplus producer. HFCS will be included in the formula, but on the consumption side only. Thus, a country would have to produce sugar in excess of its consumption of both sugar and HFCS in order to attain net surplus producer status.

Although NAFTA sugar provisions are reciprocal, it is simplest to describe them in terms of Mexican access to the U.S. market. In years l-6, Mexico will have duty-free access for sugar exports to the United States in the amount of its net surplus production, up to a maximum of 25,000 metric tons, raw value. If

Mexico is not a net surplus producer, however, it will still have duty-free access for 7,258 metric tons, or the "minimum boatload" amount authorized under the U.S. tariff-rate quota.

In years 7-15, Mexico will have duty-free access to the U.S. sugar market for the amount of its net surplus production, up to a maximum of 250,000 metric tons, with minimum duty-tree access still at the "boatload" amount.

Sugar tariffs between the United States and Mexico are scheduled to decline by 15 percent over the first 6 years and to Zero by year 15. By the end of year 6, Mexico will install a tariff-rate quota system, with a second-tier tariff applicable to all other countries that is equal to the U.S. second-tier tariff.

U.S. cane sugar refiners shipping sugar to Mexico under the Re-export Program will be guaranteed Most-Favored-Nation (see Glossary) treatment, but NAFTA will not provide lower tariffs for the re-exported sugar since refining does not confer origin on the sugar. NAFTA does allow for reciprocal duty-free access between the United States and Mexico for sugar that is refined from raw sugar produced in the other country.

The Mexican tariff on U.S. HFCS, initially 15 percent, is scheduled under NAFTA to decline to zero over 10 years: for 1995 it was 12 percent. Barriers to sugar-containing products are converted to tariffs and likewise will decline to zero over 10 years. U.S. manufacturers of sugar-containing products are optimistic that the reduction in tariffs will open market opportunities in Mexico.

Given that NAFTA is reciprocal, the same barriers for Mexican sugar access to the U.S. market also apply to U.S. sugar access into the Mexican market. Since the United States is not likely to attain "net surplus pro ducer" status, especially with a GATT-bound minimum import level, U.S. sugar will not have duty-free access (except for a boatload quantity) to the Mexican market until the year 2008. Without these trade barriers, more U.S. sugar would be sold in Mexico. For example, there might be cross-border trade from U.S. production facilities near the border. Also, sugar quality is important to many buyers, and the United States has a comparative advantage in some high-quality types of sugar.

During the debate over NAFTA, the U.S. sugar industry was concerned with how rapidly the Mexican HFCS market would grow. In the United States, HFCS has gained approximately 45 percent of the combined sugar/HFCS market, and a similar share in Mexico would amount to more than 1.5 million tons.

Mexico currently produces no HFCS but is expected to slowly develop capacity. The substitution of HFCS for sugar in Mexico will, if left to market forces, depend upon relative prices. If the Mexican sugar price level approximates the U.S. sugar price, then HFCS use in Mexico will likely grow. However, HFCS will not likely attain as high a market share as in the United States for a variety of reasons. Mexico is not competitive in corn production, and so will have to import either the HFCS or corn, resulting in increased transportation costs. The distribution system within Mexico will also likely continue to be higher cost, and the smaller market will prevent some economies of size. HFCS would become competitive in southern Mexico only if transportation costs fall and its price relative to sugar continues to fall.

Whether or not HFCS substitution results in Mexico becoming a major surplus sugar producer, NAFTA will limit Mexican access to the U.S. sugar market until the end of the 15-year phase-in period when the second-tier tariff falls to zero.

Current U.S. Sugar Market Issues

Rising Beet Sugar Market Share

Expanding beet sugar production is an ongoing structural shift in the U.S. sugar sector, and could increase competitive pressure on domestic cane sugar producers and foreign cane suppliers. The de facto minimum import level of 1.25 million short tons provides foreign cane sugar suppliers and domestic cane sugar refiners with an assured floor for cane sugar imports, regardless of beet sugar supplies. The standby domestic marketing allotments, by being based in part on historical market shares, tend to preserve market share for domestic cane sugar.

The structural shift could also test the limits of the ability of the program to function effectively. For example, the dependence of the price support mechanism on a quota system that restricted raw cane sugar supplies worked well when imported cane sugar was over 30 percent of the domestic market, but imports are now about 15 percent.

There is no futures market in refined sugar, so the futures price for raw cane sugar has served for many years as a guide to all sugar prices. When cane sugar dominated the refined sugar market, this was a reason-

able (though rough) guide. However, as beet sugar market share rises, the raw cane sugar price becomes less accurate as an industry indicator. A trade publication survey of refined beet sugar prices is best viewed as indicative, not as a price discovery mechanism.

The absence of a refined sugar futures market is not surprising, given the structure of the industry. There are seven refined cane sugar sellers, two of which are not large and market mostly locally, and also seven refined beet sugar sellers. There are only 11 independent sellers of refined sugar (7 cane, 7 beet, but 3 joint beet/cane). The three companies that process both beet and cane sugar have over half the market. The purchasing side of the market is also concentrated, though not as much.

Under the 1981 and 1985 Acts, as long as the raw sugar price was high enough to prevent cane sugar forfeitures, beet sugar prices were generally above forfeiture levels. But as the beet sugar loan rate rose under the 1990 Farm Act (fig. 35), higher beet sugar prices were required to discourage forfeiture.

Cane sugar refiners continue to be at a disadvantage under the current program. They must purchase raw sugar at supported prices and sell refined sugar in competition with beet processors, who do not face a purchase price above 20 cents a pound for their primary input.

Marketing Allotments

Standby domestic marketing allotments have been controversial. Marketing allotments were not implemented for fiscal years 1992 and 1994 but were imposed for fiscal years 1993 and 1995. For fiscal year 1993, allotments were announced at the beginning of the last quarter of the fiscal year (about June 30, 1993), when some companies had already marketed more than their annual allotment. The late announcement also caused significant market disruption, particularly for some small buyers who had difficulty obtaining supplies. Equal weights were applied to each of the three factors (past marketings, processing capacity, and ability to market) in determining the allotment levels.

When allotments were announced for fiscal 1995, the weights applied to the three factors were 25 percent on past marketings, 25 percent on capacity, and 50 percent on ability to market. For the fiscal 1995 decision, USDA determined that market efficiencies would be recognized by changing the weights for the three factors so as to create a closer correlation between each company's production and allocation.

The beet sugar share of the overall 1995 allotment is 54.17 percent, and the cane sugar share 44.83 percent.

An August 1993 lawsuit filed against USDA questioned whether the threat of forfeitures (that is, low prices) could be used as justification for allotments, even if forecast sugar imports were above 1.25 million tons. The USDA won the case and will continue to use allotments as circumstances require to control supply.

Import Quota Issues

The sugar import quota is allocated to about 40 countries based on U.S. imports during 1975-81. The justification for using that period weakens with time; many quota-holding countries are no longer net exporters. An alternative allocation would be to auction off the U.S. import quota to domestic or foreign firms. Quota rents (extra revenues received due to the U.S. price exceeding the world price) currently accrue to the quota-holding country, but the rents could be retained domestically if given to domestic firms. Also, this approach would remove much of the concern about quota shortfalls, which occur when supplying countries are unable to fill their quota.

Policy Options and Alternatives

Several options exist for the sugar program. Preserving the basic structure of the nonrecourse loan program provides one set of options. To continue price support, a mechanism for domestic supply control is necessary. At the other extreme, the domestic program could be eliminated. The policy debate in 1995 will occur in the context of the U.S. commitment to bind a minimum access level for imports of 1.256 million tons in the Uruguay Round of GATT. This commitment precludes domestic sugar legislation from increasing the protection afforded domestic sugar producers from foreign sugar, even if surpluses arise.

Policy Options Within Current Sugar Program Mechanisms

Loan Rate Options

The nonrecourse loan rate and domestic marketing allotments could be preserved. Import restrictions, under the Harmonized Tariff Schedule, would continue to provide border protection.

If the raw cane sugar loan rate were lowered from 18 cents a pound and price fell correspondingly, sugar

consumption would be slightly higher and production lower. As a result, import requirements would be higher. The magnitude of these adjustments would be larger, the lower the loan rate. Marketing allotments would less likely be triggered. Compared with the current support level, consumers would benefit and producers would lose. Quota-holding countries would experience a lower quota premium, although they could also gain volume if import requirements rose above the minimum level. HFCS producers would face more competition from lower priced sugar.

The effect of a lower loan rate on sugar prices, however, would depend upon import requirements and import policies. Prices could be maintained at levels well above the minimum implied by the lower loan rate if import constraints (at GATT-consistent levels) resulted in sufficient supply control to maintain higher prices.

Raising the loan rate (and price) would increase sugar production, slow consumption, and reduce import requirements. U.S. producers would gain, consumers would lose, and quota-holding countries would benefit from the higher price. Domestic supply control would be required. Supply controls would impede the potential for competitive evolution of market shares among various processors and could preserve historical market shares. Depending upon how the allotments were structured, some companies might receive perpetual quota value from their allotments. The market shares of domestic beet and cane sugar would likely be set by the Government. Beet sugar production might be so constrained that it would be lower with a higher loan rate, depending upon the supply control provisions.

Marketing Allotment Options

Under the current program, "allotments" refers to the overall amount of beet sugar and cane sugar permitted to be marketed, and "allocations" refers to a company's permitted marketings.

There has been considerable debate over the current method of dividing up the domestic market between beet sugar processors and raw cane sugar processors. In general, any formula that includes a base period (such as the 1985-89 crops) will tend to preserve market share for companies that are not expanding and to constrain the market share of companies that would otherwise expand. If the base period were eliminated, the penalty on expanding companies would be eliminated, and market forces would have a stronger impact on company production levels.

The current law also mandates a strict separation of the beet sugar and cane sugar allocations. A shortfall of production below either the domestic beet or cane allotment must be filled by imports, not from the other (cane/beet) domestic sector. Thus, imports could be increased while domestic sugar was being held off the market. A single allotment could hurt cane sugar refiners and quota-holding countries, but would likely benefit those parts of the U.S. sugar industry that have been expanding, since it would allow excess domestic sugar to be used to fill production shortfalls.

Deficiency Payment Program

While the current sugar program is intended to support farmers, processors also benefit. A deficiency payments program at the farm level would focus support mainly to farmers.

Sugar deficiency payments could work much as they do for other crops. A level of support would be chosen, expressed as a target price for sugarcane and sugar beets. The current levels of support prices for sugarcane and sugar beets could be maintained, for example, and distinguished by region. Processors would receive a market price for their sugar, and pay sugar beet and sugarcane farmers as they do now, based on contracts. If the grower received a price below the target price, a deficiency payment would make up the difference.

Payments could be targeted under a deficiency payment program similar to other agricultural support programs. Payment limitations, which are not possible under a price support loan program, could be implemented if desired.

While the world sugar price has been well below the U.S. price for many years, the actual U.S. price under a deficiency payments program would be affected by administrative decisions about the size of the import quota. If sugar imports were kept at minimum levels, it is quite possible that in some years the U.S. sugar price would equal or exceed support levels, reducing or eliminating Treasury costs under a deficiency payments program.

A deficiency payments program would allow sugar to more freely compete for market share with other sweeteners. Consumers would likely pay less for sugar and other sweeteners. Cane refiners could compete with beet processors without the current constraint of a price floor on raw cane sugar. Depending upon where the target price was set, sugarcane and sugar beet farmers could be better or worse off

than under the current program. Sugarcane and sugar beet processors would likely receive lower revenues. However, a portion of the decline in the sugar price received by the processor could be passed back to growers, who receive about 60 percent of revenues from sugar.

While more economically efficient than a supply control/price support program, direct support payments can be highly visible due to the potential for budget outlays.

Elimination of Domestic Program

Elimination of the U.S. domestic sugar program implies a reduction of the U.S. sugar price. The actual effect on price, however, depends on how imports are managed and on the levels of domestic sugar production and consumption.

Under one scenario, the United States could target the level of imports under the first-tier tariff at 1.256 million tons, the GAIT minimum. If domestic sugar supply were to fall or not keep up with consumption growth, the U.S. price would likely climb, perhaps even above its current level. If the price increase were sustained, U.S. sugar production would rise and consumption fall, constraining the price increase.

Alternatively, the U.S. sugar price could fall if U.S. sugar production rose sharply and low-duty imports were held at 1.256 million tons. In response to lower prices, sugar production would fall and consumption increase until a new equilibrium was reached.

The price equilibrium depends upon the level of imports and tariffs. If first-tier tariff imports were fixed at the 1.256-million-ton level and if that level of imports resulted in a surplus in the U.S market, then the U.S. price could fall to the world price plus the first-tier tariff (0.625 cent a pound) plus transportation costs (about 1.5 cents a pound to coastal cities, more to inland areas). If 1.256 million tons of imports resulted in a shortfall in the domestic market, the U.S. price could rise as high as the world price plus the second-tier tariff (currently 17.62 cents a pound) plus transportation costs.

Actual U.S. prices would not sink as low as indicated. Most U.S. refined sugar is of high quality and could maintain a premium over refined imports. The higher transportation costs to get imported sugar to the interior of the United States, the area with the largest demand for sugar, would also preserve a premium for many U.S. sugar producers.

Further U.S. Sugar Policy Considerations

Other features of the current program could be changed. A loan program for processors could be maintained, but converted to a recourse loan program where the loans would have to be paid back: there would be no Federal budget costs, continuing the no-cost feature of the current program. The assessment on domestic sugar marketings, currently providing the Treasury about $30-35 million a year, could be changed or dropped.

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Glossary

Bagasse. Fibrous residue remaining after sugarcane has been crushed to extract the sugar-containing juices.

Blends. Generic term usually referring to certain liquid and dry mixtures of sugar and other ingredients that were (1) embargoed by Presidential Proclamation No. 5071 of June 28, 1983, (2) treated as commingled merchandise pursuant to a U.S. Customs Service ruling of November 7, 1984, or (3) subjected to emergency import quotas established by Presidential Proclamation No. 5294, as amended by Presidential Proclamation No. 5340 of May 17, 1985.

Caribbean Basin Initiative (CBI). Popular name for the Caribbean Basin Economic Recovery Act of 1983, which eliminates duties on imports of products from designated Caribbean countries until September 30, 1995. The CBI also provides for import relief to U.S. industries injured or threatened by increased imports from CBI countries.

Commodity Credit Corporation (CCC). USDA agency responsible for directing and financing major USDA "action programs," including price support, production stabilization, commodity distribution, and related programs. CCC also directs and finances certain agricultural export activities. CCC activities are implemented by the Consolidated Farm Service Agency (formerly Agricultural Stabilization and Conservation Service).

Corn syrup. A purified concentrated solution of nutritive saccharides obtained from corn starch by partial hydrolysis, clarification, decolorization, and evaporation to syrup density. Many people consider the expression "glucose" synonymous with corn syrup.

Cost of production. The sum, measured in dollars, of all purchased inputs, allowances for management, investment, and rent necessary to produce farm products. Cost-of-production statistics may be expressed as an average per acre, per bushel, or per pound.

Crop year. In the sugar beet areas, the crop year is defined as the year of intended harvest. The only exception is for spring-planted beets in California that are intended to be overwintered and harvested the following year. In the mainland cane areas, the crop year corresponds with the year in which harvest normally starts, and corresponds closely to the following fiscal year. For example, Florida's 1994 crop year includes sugar produced from October 1994 to April 1995. Thus Florida's 1994 crop year is the same as fiscal 1995. In Hawaii, the crop year is the calendar year, and does not correspond to the fiscal year, since Hawaii produces sugar year-round.

Desugarization of molasses. An industrial process that extracts sugar from beet molasses. Desugarization of cane molasses is more difficult and has not achieved broad commercial application, but is reported to be under development in Hawaii. In a typical processing factory, about 15-25 percent of theoretically available sugar remains in molasses and is not recovered. A desugarization facility, usually adjacent or attached to the processing factory, can recover much of the sugar in beet molasses, raising the total recovery of theoretically available sugar in sugar beets from 75-85 percent to over 90 percent. This process allows about 10 percent more sugar to be recovered from a given tonnage of sugar beets.

Dextrose. A monosaccharide produced commercially by the complete hydrolysis or conversion of starch. Since dextrose historically has been produced largely from corn starch, it is commonly called "refined corn syrup." To the chemist, the name "glucose" is synonymous with "dextrose," but to the layman glucose usually means corn syrup or a glucose-type syrup produced from sorghum, wheat, or potato starch. Dextrose is of two principal types, hydrate and anhydrous. The larger share of the dextrose is of the hydrate type which contains approximately 8-percent moisture; the anhydrous type contains less than 0.5-percent moisture.

Direct-consumption sugar. The term "direct consumption" means any sugars that are principally of crystalline structure and any liquid sugar that are not to be further refined or otherwise improved in quality.

Drawback. A practice authorized by the U.S. Customs Service whereby an exporter of a product may claim for refund up to 99 percent of any duties

and fees paid to import the components of the product. Under regulations dealing with drawback, an export of a product is eligible for drawback if the product was made within 3 years of the date of importation of the components of the product, if the product was then exported within 2 years of the time the product was made, and if documents are to U.S. Customs within 3 years of the date the product was exported.

European Union (EU). An organization established by the Treaty of Rome in 1957 and also formerly known as the European Economic Community (EEC), the Common Market, and the European Community (EC). The EU attempts to unify and integrate member economies by establishing a customs union and common economic policies. Through 1994, the member nations included the original six countries of Belgium, Germany, France, Italy, Luxembourg, and the Netherlands, as well as Denmark, Greece, Ireland, Portugal, Spain, and the United Kingdom. Three countries, Sweden, Austria, and Finland joined in January 1995, bringing membership to 15 countries.

Extraction rate. The percentage of theoretically available sugar in sugar beets or sugarcane which a factory recovers.

Free market. A system in which the market forces of supply and demand determine prices and allocate available supplies. A free-market approach in agriculture would eliminate price and income support programs and barriers to international trade.

Free trade. Exchange of goods between countries with no trade barriers or restrictions such as tariffs or import quotas.

Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624). The omnibus food and agriculture legislation signed into law on November 28, 1990, that provides a 5-year framework for the Secretary of Agriculture to administer various agriculture and food programs. The act amended permanent legislation—the Agricultural Adjustment Act of 1938 and the Agricultural Act of 1949—for the 1991-95 crops. A further amendment extended the price support loan program for sugar to include the 1996 and 1997 crops (i.e. through fiscal 1998).

Fructose. A highly soluble, simple sugar generally considered sweeter than sucrose, and present in considerable quantities in combination with dextrose and sucrose in invert sugars.

Futures. Contracts that are legally binding commitments to deliver or take delivery of a given quantity and quality of a commodity at a specified price, during a specified month, and at a specified location.

Futures contract. A standardized fixed-price forward contract entered into on an exchange (organized center for trading in commodities). The contract is subject to all terms and conditions included in the rules of that exchange.

General Agreement on Tariffs and Trade (GATT). An agreement, originally negotiated in Geneva, Switzerland, in 1947 among 23 countries, including the United States, to increase international trade by reducing tariffs and other trade barriers. This multilateral agreement provides a code of conduct for international commerce. GATT also provides a framework for periodic multilateral negotiations on trade liberalization and expansion. The eighth and most recent round of negotiations, the Uruguay Round, was concluded in 1994 and will establish a new organization, the World Trade Organization, to oversee the multilateral trade agreement. The United States approved the Uruguay Round agreement in December 1994, and it became effective January 1, 1995 (although some provisions become effective at later dates).

Generalized System of Preferences (GSP). A policy that permits duty-free entry of certain imports from designated developing countries, for the purpose of increasing economic growth, helping maintain favorable foreign relations with free-world developing countries, and providing low-cost aid.

Glucose. Chemically, another name for dextrose. Commercially, another name for corn syrup. Glucose or glucose corn syrup is obtained by the action of acids and/or enzymes on cornstarch. Commercial corn syrups are nearly colorless and very viscous. They consist principally of dextrose and small amounts of maltose, combined with gummy organic materials known as dextrins, in water solution.

Gross returns. The measure of returns used for all sugarcane areas where the principal product of the mills is raw sugar. Gross returns from sales contained herein include CCC payments and the values of raw sugar and molasses at mainland ports of entry or market locations, based on the average market price for sugar and molasses during the applicable settlement periods.

High-fructose corn syrup (HFCS). HFCS is produced by the enzymatic conversion of a portion of the

glucose in corn syrup to fructose. The product is roughly comparable to invert syrup made from sucrose in terms of sweetness and physical properties.

Typical composition of commercially available HFCS products

	HFCS-42	HFCS-55	HFCS-80-90
		Percent	
Fructose	42	55	80-90
Dextrose	52	40	7-19
Higher saccharides	6	5	1-3

Industrial users. Sugar users, (except restaurants hotels, wholesalers, and retailers) who receive sugar directly from primary distributors.

Invert or invert sugar. The mixture of equal parts dextrose and fructose produced by the action of acid or enzymes on sucrose.

Invisible stocks. Stocks of sugar held by wholesalers, retailers, and users of sugar as distinct from stocks of primary distributors.

Market stabilization price (MSP). The market stabilization price has served numerous purposes. From December 22, 1981, to May 5, 1982, import fees and duties were applied to imported sugar to raise its price to the MSP. The import fee system was subsequently adjusted (May 5, 1982) so that import fees and duties were applied to imported sugar in an amount equivalent to the difference between the MSP and the domestic market price. Finally, when the import fee system was suspended on an emergency basis by Presidential Proclamation No. 53 13 of March 29, 1985, the calculation of the MSP was also suspended. For that reason, the calculation of the MSP was put in regulations on September 5, 1985, and the MSP served as a guide for calculating certain bonds and penalties under regulations governing quota-exempt programs. On July 8, 1991, the basis for calculating the bond requirements was changed to the difference between the No. 11 world price and the No. 14 domestic price for sugar. Currently it has no formal role in the management of the sugar program.

Molasses. The edible byproduct of the manufacture of sugar when some, but usually not all, of the crystallizable sugar in the sugarcane juice is removed by the crystallization process.

Most-Favored-Nation principle. Principle embodied in Article I of the General Agreement on Tariffs and Trade whereby any privelege or concession granted by one contracting party to GATT to a product of another contracting party will be unconditionally granted to the like product of all other contracting parties.

Net returns. The measure of returns to be shared by growers and processors in the domestic beet area. The output of the beet sugar factories consists of refined sugar, which moves directly into marketing channels. The net returns from sales of refined sugar are total returns minus delivery and marketing expenses as defined in the sugar beet purchase contract.

(New York) Coffee, Sugar & Cocoa Exchange, Inc. World and domestic raw cane sugar contracts are traded daily on the exchange. The world price is the No. 11 contract price for raw cane sugar (f.o.b. Caribbean) and the domestic price is the No. 14 contract price for raw cane sugar (c.i.f., duty/fee-paid, New York).

Ninety-six degree (96-degree) basis. A computed weight of sugar determined by dividing the weight of its sucrose content by 96 percent.

No cost. A provision of the Food Security Act of 1985, which continues to be in effect, requiring the President to use all available authorities to enable the Secretary of Agriculture to operate the sugar program at no cost to the Government. By "no cost," the sugar price support program is meant to operate so that there are no forfeitures of sugar to the CCC. The import quota on raw and refined sugar may be adjusted, or marketing allotments imposed, such that there are no forfeitures and thus no cost to the Government.

Noncentrifugal sugars. Crude sugars made from sugarcane juice by evaporation and draining off the molasses. Among local names are "muscovado," "panocha," and "papelon."

Nonrecourse loan (program). The loan program for sugarcane and sugar beets is a nonrecourse loan program. This means that if the sugar processor chooses not to redeem (pay back) the loan, the sugar used as collateral for loans from the CCC can be forfeited as full compensation for the loan, without penalty.

No. II contract price. As traded on the (New York) Coffee, Sugar, & Cocoa Exchange, this is an f.o.b., Caribbean price for raw cane sugar, and is usually referred to as the world price. It is traded in both spot and futures. The No. 11 is used under quota-exempt

programs in conjunction with the market stabilization price to calculate bonding requirements and penalties.

No. 12 contract price. As traded on the (New York) Coffee, Sugar, & Cocoa Exchange, this was the c.i.f. duty/fee-paid New York price for imported raw cane sugar. It stopped being traded on the spot market on May 31, 1985, and on the futures market on October 8, 1986. It had been used in conjunction with the market stabilization price to calculate import fees.

No. 14 contract price. As traded on the (New York) Coffee, Sugar, & Cocoa Exchange, this is the c.i.f. duty/fee-paid New York price for imported raw cane sugar. It is traded only on the futures market, and commenced on July 8, 1985. It trades at a premium (higher grade sugar) of about 0.25 cent a pound to the old No. 12 contract, and is now usually referred to as the domestic price (for raw cane sugar). The USDA uses the nearest futures as a proxy for a spot price, and for monthly averages, uses the nearest futures month for which there is a full month of data.

North American Free Trade Agreement (NAFTA). A trade agreement between Canada, Mexico, and the United States which became effective January 1, 1994. For sugar, NAFTA contains provisions which apply to U.S.-Mexico trade, but NAFTA has little effect on U.S.-Canada sugar trade. A formula defines, for each country, the net surplus production of sugar. In years l-6, Mexico will have duty-free access to the United States for the amount of its net surplus production, up to a maximum of 25,000 metric tons, raw value; in years 7-15, the maximum rises to 250,000 metric tons. If Mexico does not have any net surplus production, it will still have duty-free access for 7,258 metric tons or the minimum boatload amount authorized under the U.S. tariff-rate quota. NAFTA is reciprocal: thus the same provisions apply for access of U.S. sugar into Mexico. Over-quota tariffs are scheduled to decline by 15 percent during years l-6, and then to zero by year 15.

The Mexican tariff on U.S. HFCS will decline from its base of 15 percent *ad valorem* to zero over 10 years.

Sugar exported to Mexico under the U.S. Refined Sugar Re-export Program will not be considered of U.S. origin, and will not receive special treatment under NAFTA, but will continue to receive MFN (Most-Favored Nation) treatment.

Parity. The price per pound of sugar produced that would be equivalent to the purchasing power of a pound of sugar in the 1910-14 base year. The concept of parity was originally defined in the Agricultural Adjustment Act of 1933. The 1910-14 purchasing power is not adjusted for subsequent productivity growth. In 1986-88, the parity price for sugar approximated 1.9 times the 10-year average of the sugar price.

Polarization. A measure of sucrose concentration based on its ability to rotate the plane of polarized light. Degree of polarization is determined by means of a saccharimeter (commonly referred to as a polariscope) and is indicative of the percentage of sucrose in high-purity products such as raw cane sugar and white refined sugar.

Primary distributors. Primary distributors consist of continental cane sugar refiners, domestic beet processors, importers of direct-consumption sugar, and mainland cane processors.

Quota-exempt sugar. That sugar imported into the United States which is exempt from quota charge. This sugar is entered under bond for the purpose of re-exportation or for use as livestock feed, or production of polyhydric alcohol.

Ratoon. Second and subsequent crops grown from the root systems of previous plantings of sugarcane. Usually one or more ratoon crops are harvested before the fields are plowed and replanted. Sometimes called stubble.

Raw sugar. Any sugars, whether or not principally of crystalline structure, which are to be further refined or improved in quality to produce any sugars principally of crystalline structure or liquid sugar. In Chapter 17 of the 1995 Harmonized Tariff Schedule of the United States, raw sugar means sugar whose content of sucrose by weight, in the dry state, corresponds to a polarimeter reading of less than 99.5 degrees.

Receipts. Sugar receipts as reported by primary distributors, including quota sugar, quota-exempt sugar for livestock feed, polyhydric alcohol, and export and over-quota sugar held in bond to be charged to a subsequent year's quota.

Re-export sugar. Refers to the process, under regulations governing "Sugar to be Re-Exported in Sugar Containing Products" (7 C.F.R. 1520.200-1520.214) and "Sugar to be Re-Exported in Refined Form" (7 C.F.R. 6.100-6.113), whereby program participants import sugar exempt from quota and subsequently process the sugar for export either as refined sugar or in a sugar-containing product.

Refined sugar. A sugar with most of the undesirable nonsucrose constituents (impurities) removed, and used primarily for human consumption.

Section 22. A section of the Agricultural Adjustment Act of 1933 (P.L. 73-10) that authorizes the President to restrict imports by imposing quotas or fees if the imports interfere with Federal price support programs or substantially reduce U.S. production of products processed from farm commodities. Fees may not exceed 50-percent *ad valorem* nor may quotas exceed 50 percent of the quantity imported during a representative period determined by the President.

Section 22 import quota. Under the authority of Section 22 of the Agricultural Adjustment Act of 1933, the Secretary of Agriculture may recommend to the President the imposition of quotas on imports of an article or articles which the Secretary has reason to believe will or are likely to disrupt domestic program operations. The quotas can be imposed on an emergency basis at the discretion of the President but in no event can they be less than 50 percent of the volume of trade during a representative period. Since enactment of the Agriculture and Food Act of 1981, Section 22 import quotas have been imposed under Presidential Proclamation No. 5071 of Jude 28, 1983, and under Presidential Proclamation No. 5294 as amended by Presidential Proclamation No. 5340 of May 17, 1985. Under the Uruguay Round of the GATT, Section 22 quotas have been converted to tariffs and merged with the Harmonized Tariff Schedules of the United States.

Specialty sugar(s). Regulations governing "Certificates for the Importation of Specialty Sugars" (15 C.F.R. 2013.1-2013.7) indicate that specialty sugars are sugars provided for in items 155.20 and 155.30 of the Tariff Schedules of the United States and which: (1) are not currently commercially produced in the United States or reasonably available from domestic sources; (2) are the product of a country listed in Headnote 3(c)(ii) of Subpart A, Part 10 Schedule 1 of the Tariff Schedules of the United States, and (3) require no further refining, processing, or other preparation prior to consumption, other than incorporation as an ingredient in human food. If the certifying authority determines that a sugar meets the above criteria, then a certificate can be issued to authorize its importation as a specialty sugar. The total U.S. import quota for specialty sugars has been 2,000 tons a year. The main types of specialty sugars imported into the United States under the specialty sugar quota include brown slab sugar (an Asian sugar used for cooking) and pearl sugar used in baking. Quota amounts and new regulations to implement the Harmonized Tariff Schedule under the Uruguay Round GATT agreement are not finalized.

Sucrose. A sweet, crystallizable, colorless substance that constitutes the "sugar" of commerce. Refined cane and beet sugars are essentially 100-percent sucrose. Technically, sugar is a disaccharide of glucose and fructose having formula $C_{12}H_{22}O_{11}$, derived from either sugarcane or sugar beets.

Sugar-containing products. Products containing at least lo-percent embodied sugar. With limited exceptions, imported products that contain less than lo-percent sugar are not considered competitive with comparable domestic products.

Syrup. Concentrated clarified cane juice before crystallization.

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

Tariff-rate quota. A system in which a certain quantity of imports, called the quota amount, receives a low tariff, and imported quantities above that quota level pay a higher tariff.

Tel quel. Literally, "as such." In describing sugar, it means a polarization usually varying among mills and producing areas.