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European Union's Sugar Market

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Abstract:

Analysis of the impacts of the policy provisions of the Uruguay Round on the European Union's Sugar Market reveals that these policies will reinforce the effects of 1992 Common Agricultural Policy reforms by weakening the link between subsidies and production. Specifically, subsidized production of quota A and B sugar will show small decline and unsubsidized production of quota C, which receives the world price, will increase. The decline in EU's sugar exports will be less than the EU's commitment of reducing subsidized exports by 340,000 MT because increase in unsubsidized exports from quota C production is expected to compensate the decline in subsidized exports.

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I. Introduction

As widely known, agriculture received the foremost attention in the negotiations of the Uruguay Round of General Agreement on Tariffs and Trade (GATT) because increased price supports globally, restrictive trade barriers, excess production, subsidized exports, and depressed world prices in the early 1980s reinforced the need for trade reforms in agricultural commodities. The goal of this round in agricultural negotiation was to establish a fair and market-oriented agricultural trading system. This goal will be achieved by reducing agricultural support and phasing out the distortions in agricultural trade.

One of the commodities that is heavily traded in the world market and highly protected by many countries is sugar.¹ For example, Webb et al. (1990) estimate that in 1987, 67 percent of sugar producers' income in Japan, 60 percent in the United States, 54 percent in Canada, and 41 percent in the European Union came from government subsidies and price supports. Roberts and Whish-Wilson (1991) estimated that the European Union's sugar policy during the period 1979-89 imposed an annual implicit cost on consumers of about \$3.8 billion.

The European Union (EU) is an important player in the world sugar market with total production of 15.7 million metric tons (MMT), consumption of 13.1 MMT, and exports of 6.5 MMT in 1992. The EU intervenes in the domestic sugar market by maintaining high price supports and sells its surplus production in the world market by subsidizing the exports. Therefore, trade liberalizations will affect the EU's sugar market. As the Uruguay Round policy provisions are implemented, it is valuable for the EU in its policy decision making to know the effects of these trade reforms on domestic production, consumption, trade and

prices . The results of this trade liberalization study will be useful to producers and policy makers in the EU.

In the next section, EU's sugar policies are reviewed. In section III, the Uruguay Round provisions for the sugar market are presented. In section IV, the structure and specification of the world sugar trade model, details of country coverage, data and model estimation are discussed. In section V, the trade reform impacts on the EU sugar market are discussed. In the final section, brief concluding remarks are provided.

II. The EU Sugar Market

The European Union is one of the world's largest sugar producers in recent years and the second largest sugar exporter. In the last three decades, the European Union enacted sugar policies in order to become self-sufficient in this commodity. These policies were very successful and led to increased sugar production which in 1978 exceeded the EU sugar consumption. Since then, EU sugar producers continued to increase production while sugar consumption remained fairly stable. This trend led to larger sugar surpluses and made the European Union one of the world's major sugar exporting regions. The reasons for this development are the various sugar policies introduced by the EU which successfully isolated its domestic sugar market from the world market. The policies were also necessary because the region is a high-cost sugar producing area.

The European Union established three major policies, which include domestic production and price controls, export subsidies, and production controls on high fructose corn syrup (HFCS). Domestic production is controlled by administering three production quotas: A, B, and C. Under quota A, sugar is produced to meet the domestic demand.

Sugar produced under quota A receives the EU intervention price, an administered price substantially higher than the world sugar price. In 1988/1989, the intervention price was 0.45 ECU/kg, whereas the world price was 0.22 ECU/kg. The B quota also receives the domestic price support but faces a higher co-responsibility levy than quota A. Consequently, under quota B, sugar is produced for a price about one third less than the intervention price but still higher than the world price. Sugar produced under quota C receives the world sugar price and must be sold in the world market.

Furthermore, to protect the domestic market from a glut of sugar imports, the EU administers threshold prices and variable levies which must be paid by sugar processors for sugar imports into the EU. Since the threshold price is about twice the world price, this policy successfully limits sugar imports. Thus the EU protects its sugar producers with this import price, which is always higher than the world price unless the world price reaches 60 US cents per pound. Since sugar processors in the EU have to pay a higher import price for the imported sugar, domestically produced sugar has a strong competitive advantage over imported sugar. The variable levy effectively disconnects the link between the world price and domestic price, and thus, prevents the influence of the world price changes on the domestic market. With the HFCS production controls, the EU successfully eliminated the rise of a commodity competing with sugar. The export subsidies allow the EU sugar to compete with the sugar exports from low-cost sugar producing countries.

Under the Lome agreement, the EU has multilateral trade agreements with several African, Caribbean, and Pacific countries, which allows imports from these countries at high import prices as a form of foreign aid to these countries. The EU controls these imports by

allocating import quotas to these countries. All these policies give substantial help to domestic producers, but the administration of these policies is very costly. In order to pay for these policies, the EU sets the domestic consumer price at high levels and makes this group pay for the production subsidies.

III. The Uruguay Round Provisions for the Sugar Market

The effects of the Uruguay Round on commodity markets and the world trade will emanate from the reduction of agricultural domestic supports and trade distortions. The effects on the sugar market will be realized through changes in production, consumption, trade, and prices in individual countries. In this section, the major provisions of the Uruguay Round for specific policy reduction schedules by various countries for the sugar market are presented. The Uruguay Round provisions for agriculture can be broadly classified under four major categories: **market access, domestic support, export competition, and sanitary and phytosanitary measures.** Brief descriptions of the first three categories are given next. The source of the following provisions is GATT Secretariat (1993).

Market Access: Under the market access provision, all non-tariff barriers such as import quotas, variable import levies, and voluntary import restraints will be converted to equivalent tariff rates (*ad valorem* or specific rates). The tariff equivalent is computed using the difference between the border prices and domestic prices in the base period of 1986 to 1988, which will be reduced by 36 percent on average for all commodities over the six year transition period beginning July 1, 1995. However, the reduction for an individual commodity will be no less than 15 percent. In addition, the market access provision requires

member countries to maintain import levels equal to three percent of domestic consumption, which will be increased to five percent by the end of the six year transition period.

Domestic support: Under the provision of domestic support, an Aggregate Measurement of Support (AMS) will be computed for each product as the difference between the government administered price and a fixed external reference price times the quantity of production in years 1986 to 1988. Other government payments such as input and marketing subsidies are also included in the AMS computation. Then a Total Aggregate Measurement of Support (Total AMS) is computed as the sum of AMS of all agricultural products, which will be reduced by 20 percent during the phase-in period of July 1, 1995 to June 30, 2001. A commodity can be excluded from this reduction if the domestic support it receives is less than the five percent of total value of production. Also, domestic policy that is non-trade-distorting need not be reduced.

Export competition: Under the export competition provision, the subsidies that will be reduced are direct export subsidies including payment-in-kind, sales of non-commercial stocks at a reduced price, marketing and transportation subsidies of agricultural exports. Export subsidies computed over the base period 1986 - 1990 will be phased out over the six year transition period by 21 percent of the volume of exports and 36 percent by the value of exports on a commodity-by-commodity basis.

The detailed specific policy reduction schedule by various countries for the sugar market is given in the Appendix. The country-specific policy reduction schedules are used in the simulation analysis to analyze the impacts of the Uruguay Round negotiations on the EU sugar market.

IV. World Sugar Trade Model

This section describes the structure of a nonspatial equilibrium world sugar trade model, and provides detailed information about data, country coverage, and model estimation. The basic elements of such a model are graphically illustrated in Figure 1. The EU excess supply curve (ES_{EU}) is the difference between domestic supply (S_{EU}) and demand (D_{EU}) and represents the quantity of exports at various price levels supplied to the world market. Other Exporters' supply and demand schedules are given in the lower panel. The curve EST is the combined excess supply of all other exporters, which is the difference between the supply and demand of all the exporters. The excess demand curve (EDO) of all the importers is the difference between their total demand and total supply. Exporters' export supply (EST) and importers' import demand (EDO) are represented in the top panel under the title 'Foreign Trade'. The excess demand curve (EDN) facing the European Union is the difference between the export supply (EST) of all other exporters and the import demand (EDO) of all importers. A trade equilibrium is achieved by the clearing of excess demands and supplies generated from all the countries. The graphical analysis in this illustration uses a free trade framework for ease of exposition, while the model developed for this paper incorporates domestic and trade policies relevant for the sugar market.

Theoretical Model

The algebraic form of the necessary components of the world sugar trade model is given below.

Exporters ($i=1, \dots, n$)

The n exporting countries are divided into $n-1$ other exporters and the European Union. The domestic demand for sugar in the i th exporting countries (SUD_i) is specified as

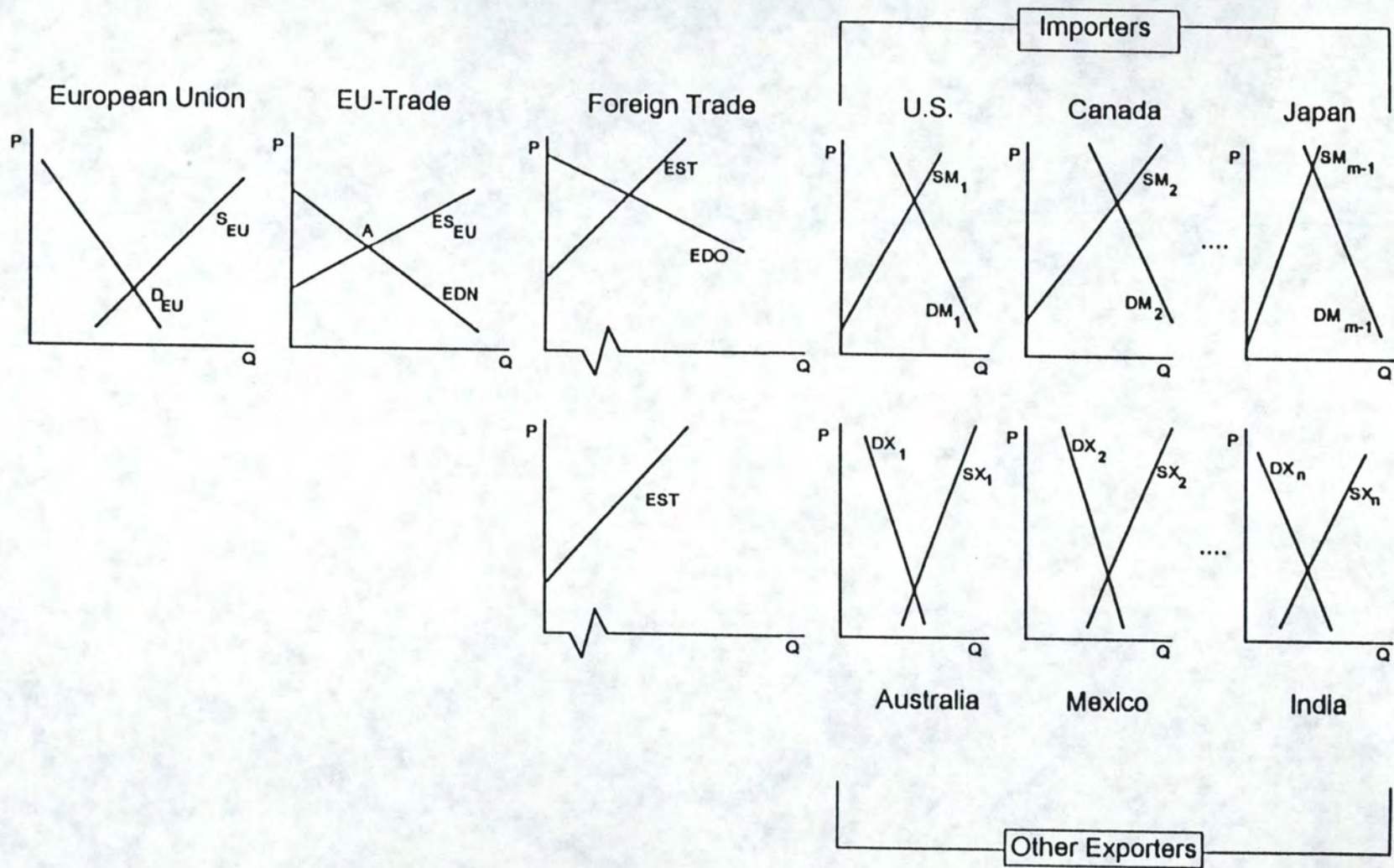


Figure 1: Illustration of a Nonspatial Equilibrium World Sugar Trade Model

$$SUD_i = D_i(SP_i, Y_i, ZP_i, X_{1i}).$$

Domestic demand for sugar (SUD_i) is determined by own price (SP_i), income (Y_i), substitute price (ZP_i) such as HFCS price, and a vector of country-specific demand shifters (X_{1i}) that explain food use. Thus, the theoretical specification for demand is based on consumer theory.

The domestic stock demand for sugar in the i th exporting country is specified as

$$SUSD_i = SD_i(SP_i, SUPD_i, GP_i, X_{2i}).$$

The behavioral relationship of stock demand ($SUSD_i$) reflects speculative and transactive motives of inventory demand. The stock demand is determined by own price (SP_i), current production ($SUPD_i$), government stock policies (GP_i), and a vector of shift variables (X_{2i}).

Domestic supply is determined by estimating acreage functions. The acreage function in the i th exporting country is specified as

$$SUAC_i = AC_i(SP_i, LSP_i, GSP_i, CP_i, X_{3i}).$$

The acreage ($SUAC_i$) is determined by current price (SP_i), lagged price (LSP_i), government price supports (GSP_i), competing crop prices (CP_i), and a vector of country specific supply shifters (X_{3i}).

Sugar supply in the i th exporting country ($SUSY_i$) is yield ($SUYD_i$) times acreage times extraction rate (ER_i) plus beginning stocks ($SUSD_{i,t-1}$). Thus,

$$SUSY_i = SUAC_i * SUYD_i * ER_i + SUSD_{i,t-1}.$$

The excess supply of sugar by the i th exporting country is the difference between domestic supply and domestic demand. Thus, the export supply ($SUES_i$) is given by

$$SUES_i = SUSY_i - SUD_i - SUSD_i.$$

By following the above demand, stock, and supply specifications, we can obtain the export supply for the European Union as

$$SUES_{EU} = SUSY_{EU} - SUD_{EU} - SUSD_{EU},$$

where the subscript EU refers to the European Union.

If an exporting country pursues border intervention policies such as export subsidies to increase its exports, then an export supply function is explicitly estimated. The total export supply of all other exporters (SUEST) is the sum of each country's export supply

$$SUEST = \sum_{i=1}^{n-1} SUES_i.$$

This function is comparable to the EST curve in Figure 1.

Importers ($j=1, \dots, m$)

The notations used for describing the supply and demand function for the exporting countries can also be used for the importing countries with two modifications. First, the subscript i is changed to j , and second, the m number of importing countries are considered. With these modifications the sugar excess demand by the j th importing country ($SUED_j$) is given by

$$SUED_j = SUD_j + SUSD_j - SUSY_j.$$

As with exporting countries, if an importing country pursues border intervention policies such as quotas and tariffs, then an excess demand function is explicitly estimated.

The sum of excess demand of m importers is

$$SUEDO = \sum_{j=1}^m SUEd_j$$

This function is comparable to the EDO curve in figure 1.

The net excess demand (SUEDN) facing the European Union is the difference between the excess demand of all the importers and the excess supply of the other exporters:

$$\text{SUEDN} = \text{SUEDO} - \text{SUEST.}$$

This function is comparable to the EDN curve in Figure 1.

The world market equilibrium for sugar will be determined by equating the excess supply of the European Union to the net excess demand of all other countries. Thus,

$$\text{SUES}_{\text{EU}} = \text{SUEDN.}$$

This world market equilibrium corresponds to point A in Figure 1.

Price linkage equations are specified to account for the transportation costs, exchange rate differences between countries, and trade policies. The price linkage equations for the importing and exporting countries and the European Union are

$$\text{SP}_i = \text{SP}_i(\text{WSP} * \text{E}_i, \text{Z}_i) \quad i=1, \dots, n-1$$

$$\text{SP}_j = \text{SP}_j(\text{WSP} * \text{E}_j, \text{Z}_j) \quad j=1, \dots, m$$

$$\text{SP}_{\text{EU}} = \text{SP}_{\text{EU}}(\text{WSP} * \text{E}_{\text{EU}}, \text{Z}_{\text{EU}})$$

where WSP is the world sugar price, E is the exchange rate between the particular country and the currency (US dollar) used to represent the world price. The vector Z represents transportation costs and trade policies such as import tariffs, quotas, and export subsidies.

Because of growing importance of high fructose corn syrup (HFCS) in the caloric sweetener industry, the corn sweetener market is also explicitly modelled.

Empirical Model

The model consists of 21 countries/regions. The exporting countries/regions included in the model are Australia, Brazil, Cuba, the European Union, India, Mexico, South Africa, Thailand, other Central America, and other South America. The importing countries/regions are the United States, Canada, Japan, Indonesia, China, the former Soviet Union, Eastern Europe, other Western Europe, other Asia, other Africa and the Rest of the World (ROW).

Data for production, consumption, exports, imports, and ending stocks are obtained from the Economic Research Service and from the Foreign Agricultural Service of the U. S. Department of Agriculture. Data for area harvested, yield, and extraction rates are obtained from the Food and Agricultural Organization of the United Nations (FAO). Macroeconomic data such as income, population, exchange and inflation rates are obtained from the International Monetary Fund (IMF). The estimation period includes the years 1970 to 1992.

For each country, functional relationships for supply and demand components, and price linkage equations are estimated. The estimation of the supply side consists of sugarcane or sugarbeet area planted and a total sugar production equation which is the product of the area planted, the extraction rate, and the yield. For some countries, the supply side also includes the estimation of sugar imports. The estimation of the demand components consists of sugar consumption, and ending stocks. For some countries, sugar exports are also estimated. The price linkage equation links the domestic price to the world price. As specified in the theoretical model, for each country excess demand or excess supply is derived and the world market clearing is established by equating the total import demand of all the importers and export supply of all the exporters.

The model includes a total of 82 endogenous equations and 21 market clearing equations, which determines 103 endogenous variables and uses 205 exogenous variables. Both linear and nonlinear techniques are used in estimating the endogenous equations.² Because of the space limitations, the complete empirical model, which runs about 130 pages, could not be included in the text. However, readers interested in the modeling approach, structural coefficients, and estimated equations can obtain the model documentation with complete empirical model and elasticities from the author.

V. Effects of the Uruguay Round on the EU sugar market

In this section, details about baseline projections and Uruguay Round projections and impacts are presented.

Baseline Projections: To examine the effects of the Uruguay Round a baseline scenario is run to project the endogenous variables over the period 1993 to 2001 by using the forecast values of the exogenous variables. The baseline values of the endogenous variables serve as a benchmark to measure the effects of the trade liberalization. The forecast values of the exogenous variables, which are used in projecting the endogenous variables, are derived from various sources: GDP, GDP deflator, exchange rates, commodity production and prices are obtained from the Food and Agricultural Policy Research Institute (FAPRI, 1994b). Population forecasts are obtained from the USDA (1993). Crude oil prices and coffee prices come from a World Bank Report (1992).

Before examining the Uruguay Round impacts, it is worth examining salient features of the baseline projections for the years 1993 to 2001, which are presented in table 1. The total sugar production of the European Union (Figure 2) shows a slight decrease of about 2.2 percent over the projection period. This decrease is caused by small declines in quota A and B production, which are moderated by increases in quota C production. The declines in quota A and B production are in response to Common Agricultural Policy (CAP) reforms of reducing agricultural support prices. The increase in quota C production is due to higher world prices because quota C production is generally meant for export markets and producers receive the world price for quota C sugar and, therefore, respond to world price. Sugar consumption will remain fairly steady over the estimation period which is caused by a stagnation in population growth and a possible substitution of alternative sweeteners for

Table 1. Baseline Projections for the European Union

	1993	1994	1995	1996	1997	1998	1999	2000	2001
	(1000 MT)								
Production Quota A	11020.74	11232.38	10771.29	10380.31	10480.69	10457.15	10430.20	10408.72	10403.50
Production Quota B	2651.26	2702.18	2591.25	2497.20	2521.34	2515.68	2509.20	2504.03	2502.77
Production Quota C	1940.77	2159.19	2694.83	2661.08	2573.31	2608.16	2528.87	2397.54	2366.14
Total Sugar Production	15612.78	16093.74	16057.38	15538.59	15575.34	15630.98	15468.26	15310.28	15272.41
Sugar Consumption	12866.24	12849.45	12824.34	12858.02	12844.15	12838.40	12851.35	12854.09	12892.12
Ending Stocks	2780.17	2719.26	2945.52	3109.96	2959.86	3006.84	3019.06	3010.91	3041.02
Sugar Imports	3427.91	3239.53	3260.78	3252.69	3153.85	3142.00	3202.30	3201.81	3245.76
Sugar Exports	5841.36	6733.11	6246.30	5776.90	6133.99	5899.45	5746.69	5666.65	5552.00
	(US\$/MT)								
EU Sugar Import Price	544.05	590.00	552.32	509.52	552.60	545.35	542.18	541.26	538.14

Table 2. Uruguay Round Projections for the European Union

	1995	1996	1997	1998	1999	2000	2001
	(1000 MT)						
Production Quota A	10704.38	10321.50	10406.55	10343.56	10299.91	10276.55	10248.60
Production Quota B	2575.16	2483.05	2503.51	2488.35	2477.85	2472.23	2465.51
Production Quota C	2714.83	2681.52	2589.37	2670.24	2616.00	2467.64	2473.97
Sugar Production	15994.37	15486.06	15499.43	15502.16	15393.76	15216.42	15188.08
Sugar Consumption	12835.28	12884.25	12903.27	12949.46	12960.00	12953.24	12972.27
Ending Stocks	2932.96	3093.01	2946.41	2982.32	2983.30	2975.60	2999.29
Sugar Imports	3280.69	3291.02	3226.11	3274.52	3332.30	3327.49	3349.74
Sugar Exports	6184.92	5722.46	6033.77	5742.90	5707.29	5603.18	5519.61
	(US\$/MT)						
EU Sugar Import Price	540.30	499.40	544.24	525.81	527.70	524.31	524.02

Table 3. Effects of Uruguay Round on the EU Sugar Market (Levels in 1000 MT)

	1995	1996	1997	1998	1999	2000	2001	1995-2001 Avg.
Production Quota A	-66.91	-58.82	-74.14	-113.59	-130.29	-132.17	-154.90	-104.40
Percentage Change	-0.62	-0.57	-0.71	-1.09	-1.25	-1.27	-1.49	-1.00
Production Quota B	-16.10	-14.15	-17.84	-27.33	-31.34	-31.80	-37.26	-25.12
Percentage Change	-0.62	-0.57	-0.71	-1.09	-1.25	-1.27	-1.49	-1.00
Production Quota C	20.00	20.44	16.06	62.09	87.13	70.10	107.83	54.81
Percentage Change	0.74	0.77	0.62	2.38	3.45	2.92	4.56	2.21
Sugar Production	-63.01	-52.53	-75.92	-128.82	-74.50	-93.87	-84.33	-81.85
Percentage Change	-0.39	-0.34	-0.49	-0.82	-0.48	-0.61	-0.55	-0.53
Sugar Consumption	10.94	26.23	59.13	111.06	108.65	99.16	80.15	70.76
Percentage Change	0.09	0.20	0.46	0.87	0.85	0.77	0.62	0.55
Ending Stocks	-12.56	-16.95	-13.45	-24.52	-35.76	-35.32	-41.74	-25.76
Percentage Change	-0.43	-0.55	-0.45	-0.82	-1.18	-1.17	-1.37	-0.85
Sugar Imports	19.91	38.33	72.26	132.52	129.99	125.68	103.98	88.95
Percentage Change	0.61	1.18	2.29	4.22	4.06	3.93	3.20	2.78
Sugar Exports	-61.38	-54.45	-100.22	-156.56	-39.40	-63.47	-32.38	-72.55
Percentage Change	-0.98	-0.94	-1.63	-2.65	-0.69	-1.12	-0.58	-1.23
EU Sugar Im. Price	-12.02	-10.13	-8.36	-19.54	-14.48	-16.95	-14.12	-13.66
Percentage Change	-2.18	-1.99	-1.51	-3.58	-2.67	-3.13	-2.62	-2.53

sugar. Quota A and B sugar is generally used to meet the domestic demand which is not expected to increase significantly and thus does not require increases in quota A and B production. The EU import price for sugar will remain at levels of about \$225 to \$264 per MT above the world price. Relatively small declines in production and stable consumption will allow the European Union to remain one of the world's largest sugar exporters, though modest declines in exports are anticipated.

The Uruguay Round Projections and Impacts: As discussed in section III, beginning July 1995 the GATT member countries are expected to implement the policy provision schedule by reducing aggregate measurement of support, tariff equivalents, and export subsidies and increasing import access. The policy parameters provided in the Appendix along with the new income growths under the GATT (obtained from the USDA) are incorporated in the world sugar trade model and the GATT scenario is run for the period 1995 to 2001. Though the focus of this study is to examine the effects of the Uruguay Round on the EU sugar market only, the impacts on other countries' sugar markets are also generated. The results for other countries are available from the authors upon request. The Uruguay Round projections from the sugar model for the European Union are reported in table 2 for the years 1995 to 2001. The effects of the Uruguay Round on the EU sugar market are presented as absolute and percentage changes from the baseline projections in table 3.

The simulation results show that EU production quotas A and B will decrease by an annual average of about 104,000 MT and 25,000 MT, respectively from 1995 to 2001 compared to the baseline projection. The declines in quota A and B production are caused by the reduction in domestic producer support prices and subsidies. In contrast, the EU production quota C will increase by an annual average of about 55,000 MT (2.2 percent)

between 1995 and 2001 compared to the baseline in response to higher world prices. Since the declines in production of quota A and B are slightly larger than the increase in quota C production, the total sugar production shows a small decline by an average of 0.53 percent over the period 1995 to 2001 (also refer to Figure 3 for the impacts on production). Though the sugar production declines slightly over the projection period, it is important to note that the impact of the Uruguay Round on EU sugar production is not expected to be as pronounced as the impacts on other crops. This is because sugarbeet production in the EU is relatively more profitable than other crops. Consequently unsubsidized area under sugarbeet production in the EU is likely to increase as a result of the Uruguay Round, which is evident from the result that quota C production increases. In contrast, the Uruguay Round is expected to have a larger production decline on grains (also see USDA).

The EU sugar consumption is projected to increase, which is caused by a decline in domestic prices, population increase, and the additional increase in EU income resulting from the Uruguay Round (Figure 4). This increase in sugar consumption will be about 71,000 MT (0.55 percent) per year higher than the baseline levels. Sugar exports by the EU show a decline of about 73,000 MT or 1.2 percent (Figure 4). This reduction in sugar exports is less than EU's commitment of reducing subsidized exports by 340,000 MT because increase in unsubsidized exports from quota C production is expected to compensate the decline in subsidized exports (see also FAPRI, 1994a). The decline in the sugar exports is the result of the reduction in the export subsidies called for by the Uruguay Round and also due to decrease in production and increase in consumption resulting from the dynamics of the policy changes. As a result of tariffication and import access provisions of the Uruguay Round, EU sugar imports increase by an average of 89,000 MT (2.78 percent).

Figure 2. EU Sugar Production under Baseline

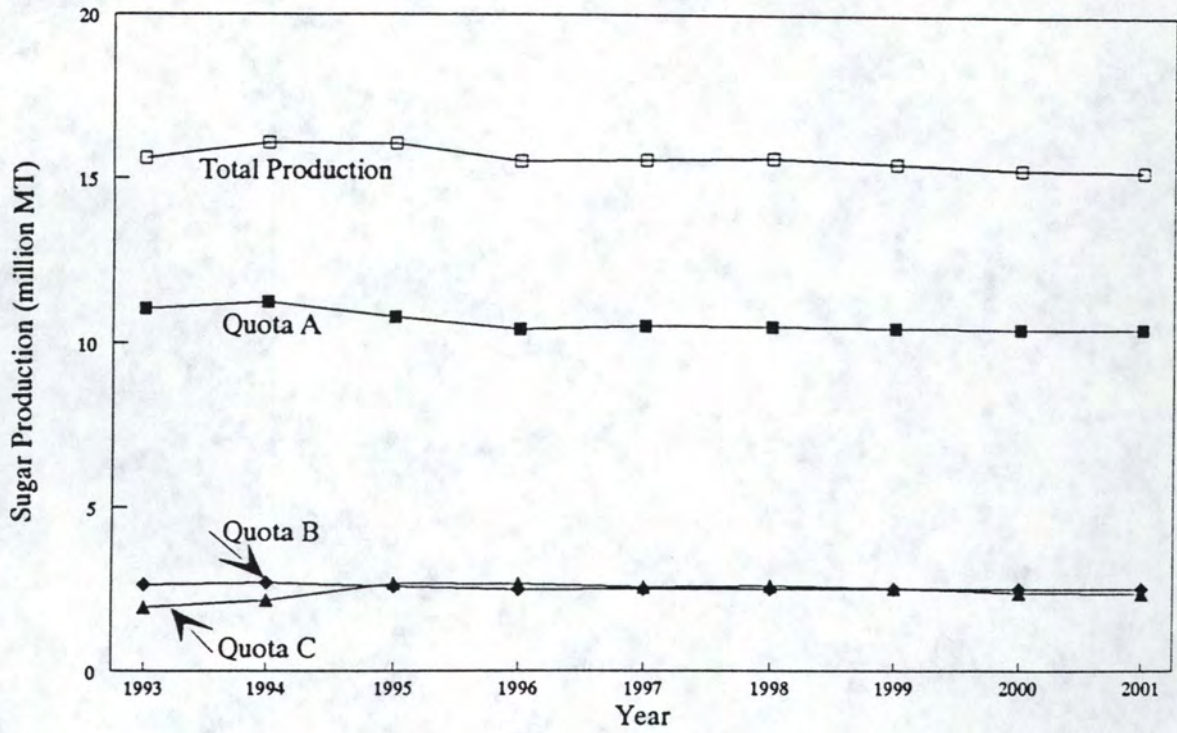


Figure 3. Effects of the Uruguay Round on EU Sugar Production

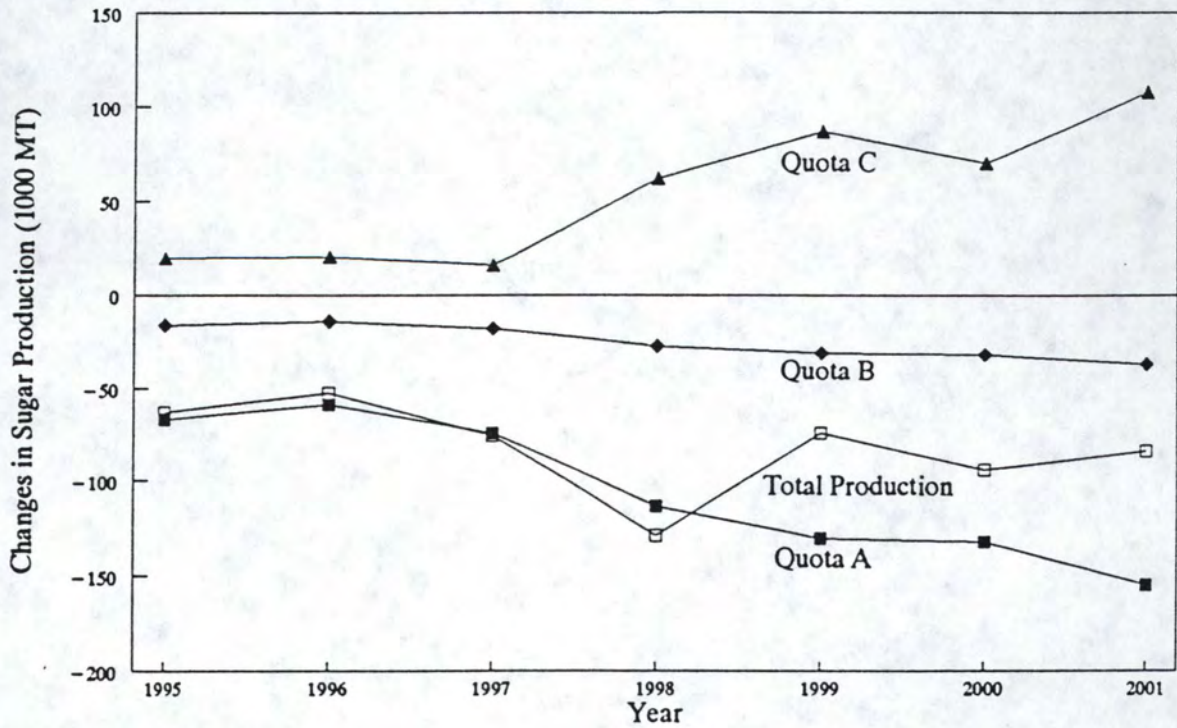


Figure 4. Effects of the Uruguay Round on EU Consumption and Exports

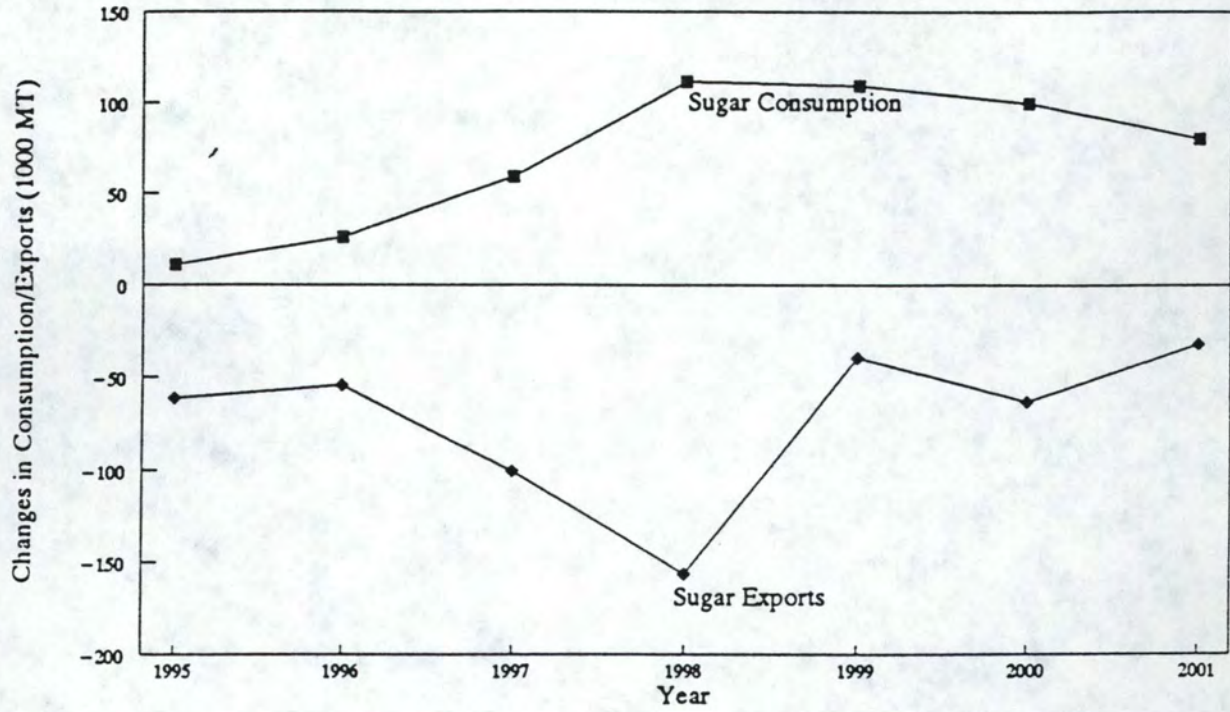
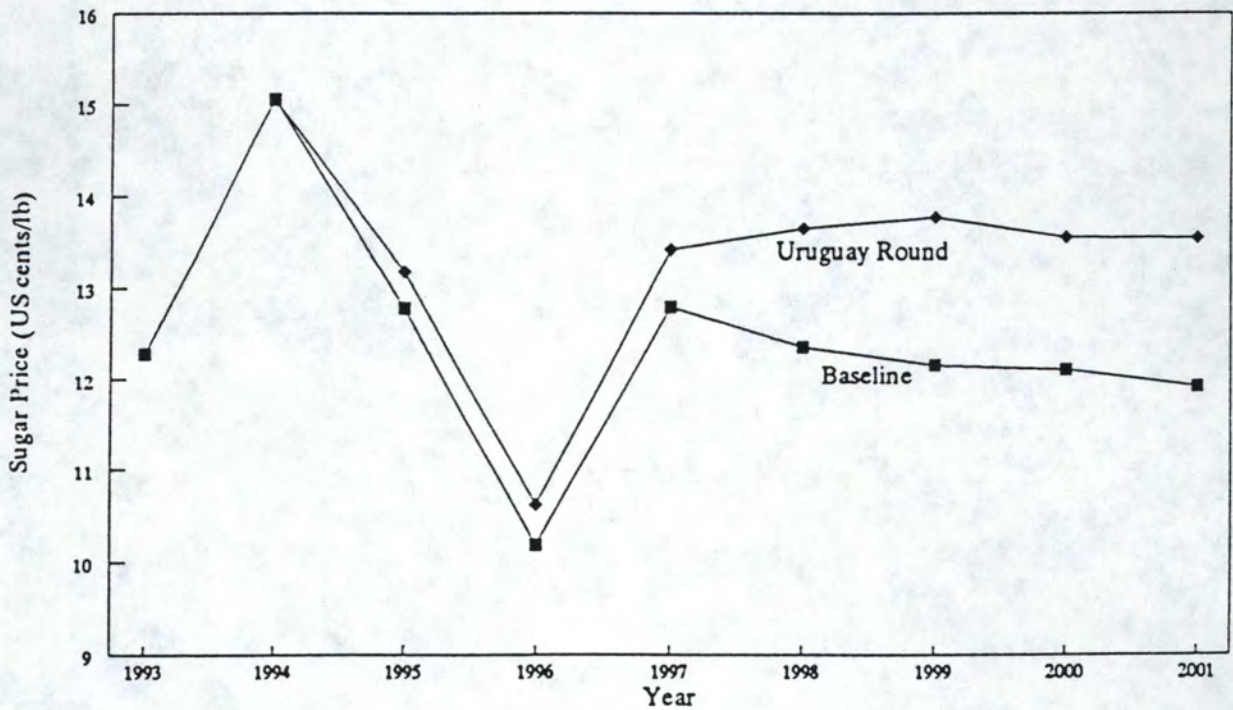


Figure 5. Effects of the Uruguay Round on the World Sugar Price



VI. Conclusions and Implications

The study focussed on the impacts of the Uruguay Round provisions on the EU sugar market. As a result of these provisions, the European Union has to reduce its domestic price support, export subsidies, and import barriers and to increase the market access of sugar imports. In summary, sugar production under quota A and B is expected to decline; however unsubsidized sugar production under quota C, which receives the world price, will increase. This is because sugarbeet production in the EU is more profitable compared to other crops partly as a result of reduction in grain and oilseed prices stemming from the CAP reforms. The higher world sugar price resulting from the Uruguay Round (Figure 5) will cause producers to increase area under quota C production. Consequently, as increase in production under quota C helps to offset some of the decreases in production under quota A and B, total sugar production shows only a small decline. Provisions calling for reductions in subsidized exports will limit exports only slightly; however unsubsidized exports are expected to increase.

The CAP's 1992 reforms led to lower domestic support prices, and this trend will be reinforced by the Uruguay Round of GATT. These policy developments will improve the CAP's inefficient farm programs with high budgetary outlays and costly ways of providing support to farmers. These policy reforms will aid to weaken the link between subsidies and production and discourage surplus production. In doing so, the EU farm policy will become more market-oriented. The Uruguay Round will provide additional ammunition for moving toward free market agriculture by easing the CAP's budgetary pressure on the EU as domestic support price and export subsidies are reduced. Consumers will also benefit from lower sugar prices which cause domestic demand to increase.

Endnotes

1. Borrell and Duncan (1993) provide a detail discussion of various countries' sugar policies.
2. The estimation procedure used is ordinary least squares (OLS). The OLS estimation technique is preferred over simultaneous estimation techniques because with a large number of exogenous variables and limited number of observations, simultaneous estimation techniques pose degrees of freedom problem. The principal component technique is frequently used to circumvent the degrees of freedom problem. Since the number of exogenous variables is too large in the model, the principal component technique was not used to estimate the model.

Appendix: The Uruguay Round Policy Provisions for Sugar. ^{1,2}

Description	Australia	Brazil	Canada		Czech Republic	Egypt	European Union	Finland
Base Period, 1986-88			Beet	Cane				
Aggregate Measure of Support ³								
Price Support								
Administrated price	398 Aus\$/mt	250 US\$/mt					614.1 ECU/mt	484 FIM/mt
External price	270 Aus\$/mt						193.8 ECU/mt	218 FIM/mt
Eligible production	814,000 mt	7.967 Mil mt					13.3 Mil mt	771,000 mt
Total market price support	104.19 Mil Aus\$	813.3 Mil US\$					5,608 Mil ECU	215 Mil. FIM
Price related direct payment								
Other nonexempt direct payments			10.1 Mil Can \$					
Other direct payments		28.0 Mil US\$	3.3 Mil Can \$					
Nonexempt payments								
Nonexempt direct payments								
Credit								2.4 Mil. FIM
Global Measure of Support								
Other net price supports								
Total direct payment			13.4 Mil Can \$				(341) Mil ECU	
Product specific budgetary outlay								
Total AMS	64.73 Mil Aus\$	856.6 Mil US\$	13.4 Mil Can \$				5,266 Mil ECU	217 Mil. FIM
Required/applied reduction	20 Percent	13.3 Percent	20 Percent				20 Percent	20 Percent
Bound rate ⁴								
Final outlay ⁴	51.78 Mil Aus\$	742.6 Mil US\$	10.7 Mil Can \$				4,213 Mil ECU	174 Mil. FIM
Tariffication								
Current rate of duty	76 Percent							
Internal price	410 Aus\$/mt				70.0 Percent			
External price	268 Aus\$/mt						719 ECU/mt	6.74 FIM/mt
Tariff Equivalent: base rate	143 Aus\$/mt						195 ECU/mt	1.14 FIM/mt
Required/applied reduction	55 Percent	46 Percent	32.54 Can \$/mt	28.38 Can \$/mt			524 ECU/mt	5.61 FIM/mt
Bound rate ⁴	50 Percent	25 Percent	15 Percent	15 Percent	15 Percent	30 Percent		493 Percent
Final outlay ⁴	28 Percent	35 Percent	27.7 Can \$/mt	24.1 Can \$/mt	59.5 Percent	33 Percent	20 Percent	15 Percent
Import Access								
Current access								
Minimum access							1.876 Mil mt	
Base level consumption							10.847 Mil mt	

Appendix: The Uruguay Round Policy Provisions for Sugar. (contd.)^{1,2}

Description	Australia	Brazil	Beet	Canada	Cane	Czech Republic	Egypt	European Union	Finland
New Access									
Initial 1995									
Final 2000									
Initial in-quota tariff rate									
Final in-quota tariff rate									
In-quota tariff rate									
Initial tariff quota								0 Percent	4.53 Percent
Final tariff quota ⁴								1.565 Mil mt	118,000 mt
								1.565 Mil mt	118,000 mt
Export Subsidies. Base period is 1986-90, with no front-loading option.									
Quantity									
Base rate									
Average of 1986-1990		791,300 mt						1.617 Mil mt	
Average of 1991-1992									
1995 level									
Required/applied reduction		24.0 Percent						21 Percent	
Bound rate ⁴		601,400 mt						1.277 Mil mt	
Expenditure									
Base rate									
Average of 1986-1990		56,000 US\$						777 Mil ECU	
Average of 1991-1992									
1995 level									
Required/applied reduction		24.0 Percent						36 Percent	
Bound rate ⁴		43,000 US\$						497 Mil ECU	

Appendix: The Uruguay Round Policy Provisions for Sugar. (contd.)^{1,2}

Description	New Zealand	Norway	Pakistan	Philippines	Singapore	Slovak Republic	Thailand	United States
			Beet	Cane				
New Access								
Initial 1995								
Final 2000								
Initial in-quota tariff rate				50 Percent				
Final in-quota tariff rate				50 Percent				
In-quota tariff rate							65 Percent	1.46 US\$/kg
Initial tariff quota				103,400 mt			13,000 mt	1.139 Mil mt
Final tariff quota ⁴				103,000 mt			14,000 mt	1.139 Mil mt

Export Subsidies. Base period is 1986-90, with no front-loading option.

Quantity

Base rate
 Average of 1986-1990
 Average of 1991-1992
 1995 level
 Required/applied reduction
 Bound rate⁴

Expenditure

Base rate
 Average of 1986-1990
 Average of 1991-1992
 1995 level
 Required/applied reduction
 Bound rate⁴

Note: Australia, Czech Republic, Egypt, India, Israel, New Zealand, Pakistan, Singapore and Slovak Republic did not specify import access and export subsidies in the schedule. Czech Republic, Egypt, Iceland, Singapore, Slovak Republic and Thailand did not specify the AMS. Hungary did not specify tariffication export subsidy expenditures. Iceland, Norway, Philippines and Thailand did not specify export subsidies.

Footnotes: 1 This appendix is adapted from V. Premakumar et. al. (1994)

2 This appendix is based on the schedules submitted prior to April 15, 1994 and does not incorporate changes made by the countries after that date.

3 By agreement, reduction commitment is on aggregate level across commodities, and not by tariff line items.

4 For developed countries, bound rate, final outlay, tariff rate quota apply to year 2000, but for developing countries year 2004.

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