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Impact of the EU Sugar Policy Reform and the WTO-DDA on the U.S. Sugar Industry

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Abstract

The EU reforms will increase the Caribbean sugar price, but will not affect the U.S. sugar industry. If liberalization occurs based on the WTO-DDA, U.S. wholesale sugar price will decrease from 24.89 to 23.79 cents per pound. It is also expected the Caribbean price to increase from 8.7 to 12.1 cents per pound.

Key Words: Sugar, Liberalization, EU Reform, Doha Development Agenda

Introduction

Many producing countries in the world provide protection to their sugar industries under direct or indirect support instruments. Regional and multinational free trade agreements are creating pressure for sugar producing countries to reform their sugar policies. For instance, in April 2005, the World Trade Organization (WTO) ruled the appealed dispute brought by Australia, Brazil and Thailand against the European Union (EU) sugar regime. The panel concluded that the EU has been exporting more sugar with export subsidies than it is permitted to do under the WTO agreement. As a result of this decision, the EU will be required to substantially reduce its expenditure in sugar support programs and adopt policies that are in line with the recommendations from the WTO panel.

Independently of the WTO-panel's decision, in July 2004, the EU proposed a reform of its sugar policy that is expected to be published in some form in June 2005.

The changes are oriented to make the sugar sector more competitive and will frame the EU position for the WTO-Doha Development Agenda (WTO-DDA) negotiations in Hong Kong in December 2005. Also, under the current WTO-DDA, member countries are negotiating a substantial improvement in market access to be applied to all agricultural commodities including sugar.

The future of the United States and world sugar industries is uncertain under these potential changes in policies (Kelch and Normile; Roney). Therefore, it is important to study the impact of trade liberalization policies on U.S. producers and consumers and the implications on the world sugar market.

The objectives of this paper are to evaluate the potential effect of the recently proposed structural changes of the sugar policy regime in the EU and the currently proposed changes under WTO-Doha negotiations. The global sugar policy simulation model developed by Benirschka, Koo, and Lou was used for the analysis of alternative scenarios.

Previous research has evaluated the effect of trade liberalization policies on the sugar industry in the United States and world markets (Koo; Beghin et al.; Haley; U.S. General Accounting Office; Borrell and Pearce; Wohlgenant). These studies have reported an increase in world sugar price when major sugar markets move to freer trade policies. Borrell and Pearce; and Koo found that if the EU and the United States liberalize their sugar industries, it will cause the world price to increase by 20 and 68 percent, respectively. However, Koo concluded that if only the United States liberalizes its sugar industry, world price will increase by 33 percent and the U.S. wholesale sugar price will decrease by 20 percent. Haley found that, under a free trade scenario, U.S.

wholesale sugar price would decrease 13 percent. Under partial and complete trade liberalization of developed countries, Wohlgenant found a reduction of the world sugar prices by 0 and 9.8 percent, respectively.

In terms of social benefits, it has been reported that reduced sugar prices in the United States would create an increase in consumer surplus and a reduction of producer surplus (Koo; U.S. General Accounting Office). Koo also added that U.S. producers are more affected when only the United States liberalizes its industry than when liberalization takes place for the United States and the EU. In the case of a world trade liberalization, Wohlgenant concluded that developing countries would benefit and that their export earnings could increase between 27-31 percent. Milner, Morgan, and Zgovu studied the impact of the 2004 proposal reforms of the EU sugar policy on the welfare of African, Caribbean and Pacific countries (ACP). These researchers concluded that while welfare transfer will fall for some ACP countries, others may benefit as a result of a positive effect on the world sugar price.

The following section presents a description of the EU sugar industry and the current issues debated in the Doha Development Agenda. Following, the sugar model and alternative scenarios are discussed; results of the simulation model are presented; and finally, a summary of results is presented.

The EU Sugar Industry

Until 2003, the EU was formed by Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Iceland, Luxemburg, Netherlands, Portugal, Spain, Sweden and the United Kingdom. In May 2004, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia joined the EU. During 2003, the EU

gross domestic product (GDP) was 7 trillion U.S. dollars, lower than 11.0 trillion from the United States. In the world agricultural market the EU is the largest importer and the second largest exporter of agricultural products (ERS USDA, 2005). Despite the importance of agriculture for the EU, similarly to the United States, there is a declining role of agriculture in the general economy (Normile and Price).

The EU has an important paper on the world sugar market. With the recent enlargement, EU-25, production is expected to be between 19-20 million metric tons (MT). In terms of the world trade share the EU accounts for about 14 percent of production, 13 percent consumption, 12 percent exports and 5 percent imports. Sugar is produced from sugar cane (2 percent) and beets (98 percent) and it takes place in almost all member states, except in Luxembourg, Estonia, Cyprus and Malta. Major producing states are France and Germany with about 50 percent of total production, followed by Poland, Italy, and the United Kingdom (European Commission (b)).

Policy Issues

Agricultural production, consumption, and trade in the EU has been highly influenced by government programs through the Common Agricultural Policy (CAP). The CAP was inserted in 1957 when the European Economic Community was created by the Treaty of Rome. Since its creation, the CAP transformed the agricultural trading position of the EU from a net importer into the second largest exporter of agricultural products (ERS USDA, 1999). Major reforms of the CAP occurred in 1992 and 1999, and a third major reform was passed in June 2003.

The E.U. sugar policy started in 1965 as part of the CAP and major amendments have not been applied since its inclusion. The last version of the sugar policy was

completed in 1995 for and extension of its validity until the 2000/2001 marketing year. Under CAP, protection for the sugar industry is provided through guaranteed intervention and minimum prices, production quotas, import controls and export subsidies (ERS USDA, 2003). Other mechanisms are applied for sugar used for production of alcohol and yeast and for isoglucose and inuline syrup. As a result, domestic wholesale price of refined sugar is about 300 percent higher than world price (Roney).

The intervention price is a mechanism in which intervention agencies are committed to purchase eligible sugar at a minimum price, which has been constant since 1993 at € 631.90 (780 U.S. dollars) and € 523.70 (646.5 U.S. dollars) per metric ton of refined and raw sugar, respectively (European Commission (b); Mitchell). Minimum prices have been established at which sugar processors are required to buy from beet growers. The prices, unchanged since 1992, are set at € 46.72 (57.7 U.S. dollars) and € 32.42 (40.0 U.S. dollars) per metric ton for beets used to produce *A*-quota sugar (82 percent) and *B*-quota sugar (18 percent), respectively (Mitchell; ERS USDA, 2004). The difference between the two quotas is mainly the amount of levies applied to each of them. During the period 2003-2004, the total production quota was about 17.4 million MT (EU-25), divided into 14.7 million MT *A*-quota, in which the outlet is guaranteed and the guarantee price may be reduced up to 2 percent for the production levies, and 2.7 million MT *B*-quota, of which the outlet is also guaranteed but at a price which can be decreased up to 39.5 percent for levies (ERS USDA, 2004). *C*-quota sugar, which must be exported with no subsidy or stored and used as part of the following year's *A* and *B* quotas, varies from year to year at about 3.0 million MT.

Production quotas are also established for isoglucose (0.5 million MT) and inulin syrup (0.3 million MT) (ERS USDA, 2004).

Imports are restricted by the implementation of two tariffs, one fixed and the other depending on the volatility of the world market price of sugar. The fixed duty is established at € 419 (517 U.S. dollars) and € 339 (419 U.S. dollars) per MT of refined and raw sugar, respectively. During 2004 sugar imports fared an average total import tariffs of about € 700 (864 U.S. dollars) per MT (ERS USDA, 2004).

Special access to the EU sugar market has been given to 46 countries from Africa, the Caribbean, and the Pacific (ACP), including India. These countries can export sugar to the EU at internal prices. The total import agreement was set at 1.3 million MT in 1975. In 1995, another import allocation (200,000 to 350,000 MT) was made to ACP countries. Additionally, the EU took over import commitments from joining members in 1995 totaling 85,500 MT. Also, 100,000 MT in 2001/02 were temporarily granted to several countries in the Balkans (Mitchell).

In July 2004, the EU proposed a new reform of its sugar policy, which follows the basic principles of reforms implemented in 2003, and is expected to be effective in some form during 2005 (Kelch and Normile; European Commission (a); ERS USDA, 2004).

Specifically, some of the reforms include the following:

1. A cut in the intervention price (renamed "reference price") of refined sugar from € 632 to € 421 (780 to 520 U.S. dollars) per MT. Also, the proposal reduces the tariff protection to € 421 per metric ton, which is at the same level as the proposed reference price.

2. Reduction of sugar beet price from € 32.8 to € 27.4 (40.5 to 33.8 U.S. dollars) per MT.

3. Production quota reduction from 17.4 million MT to 14.6 million. The proposal applies to *A*-sugar only and the other categories are no longer considered. Additionally, the production quota of isoglucose is increased from 0.5 to 0.8 million MT.

4. New member countries are compensated as old members in terms of sugar support programs.

5. Introduction of decoupled payments to sugar farmers in the form of Single Farm Payments (SFP) to compensate 60 percent of lost revenue due to price and quota reductions. SFP will be granted to farmers who grew sugar beets during the reference period (2000-2002) and will not be affected by any subsequently quota transfers.

6. Sugar imports from ACP and India will remain at 1.3 million MT; however, price is reduced from € 421 to € 329 (519.8 to 406.2 U.S. dollars) per MT.

If the EU is able to pass such reforms, production and exports would be reduced substantially, with the potential of increasing world sugar prices (Kelch and Normile; European Commission (a)). According to the EU commission, reduction of export subsidies and decoupling aid from sugar beet producers will increase domestic sugar imports from developing countries. In contrast, reports from the American Sugar Alliance (ASA) have concluded that because of a declined role of the EU in the world sugar market, the proposed sugar policy reform will not be an important factor in world sugar prices and in the U.S. sugar industry. According to the ASA, the proposed sugar

policy will not preclude that large volumes of sugar exports from the EU take place, and the proposed price reduction would still leave domestic wholesale sugar prices above U.S. price levels.

For the EU-15 member countries, both production and domestic use have significantly increased over time (ERS USDA, PS&D Tables). Total sugar production and consumption in 1961 was 6.3 and 5.5 million MT, respectively; and in 2004 production and consumption totaled 16.5 and 14.4 million MT. Despite this significant change from the 1960s levels, production has remained relatively stable since 1998 and domestic consumption has been almost constant since the beginning of the 1990s (figure 1). From 1961 to 1981 total exports of refined sugar increased (figure 2). From 1981 to 2003, exports have oscillated between 5 and 7 million MT, and in 2004, total exports were 4.6 million MT. Exports have exceeded imports since 1977. Imports increased substantially from 1961 to 1974, and since 1978, have been relatively stable and significantly below the volume of sugar exports (figure 2). Total imports, mostly raw sugar, were 2.1 million MT in 2004. In general, the EU is a net exporter; however, because of the difference between the high price paid for imports relative to the low price received for exports, a negative trade balance in terms of value has existed since 2002 (European Commission (b)).

The Doha Development Agenda (DDA)

The DDA was launched in November 2001 with strong leadership by the United States. The DDA covers six broad areas including agriculture, non-agricultural market access, services, the Singapore issues (transparency in government procurement, trade facilitation, investment and competition), rules (trade remedies), and development-related

issues (U.S. Office of Trade Representative (USTR, 2004 (b)). The DDA is the largest negotiation of this type in history, covering items such as cars, agricultural products, communication services, and custom rules. In the Doha agenda the United States proposed the following (USTR, 2004 (a); WTO):

1. eliminate agricultural export subsidies;
2. decrease levels of trade-distorting domestic support; and
3. increase real market access opportunities in developed and developing countries through tariff cuts and quota expansion.

Tariffs will be cut using a tiered formula that will lead to greater harmonization in tariff levels across countries. Substantial improvement in market access is to be applied to all agricultural products, including sensitive products. Countries will be able to designate a specific number of sensitive products that will be handled through a combination of tariff quota expansion and tariff reductions to expand market access (WTO).

The proposal aims for elimination of export subsidies and for the elimination of export credits with repayment periods beyond 180 days and export guarantee programs. Another key objective is the elimination of trade distorting practices in sales of State Trading Enterprises; thereby, eliminating the monopoly power of such entities. The idea is that during the first year of implementation, each Member's total permitted trade-distorting support will be cut by 20 percent from current levels (USTR, 2004 (a); WTO).

Model and Scenarios

The simulation model developed by Benirschka, Koo, and Lou was used to estimate the changes in production, consumption, and price. The model includes 17

countries and regions: Australia, Brazil, Cuba, the EU-25, South Africa, and Thailand as major exporters; and Algeria, Canada, China, Indonesia, Egypt, India, Japan, Mexico, the former Soviet Union, the United States and the Rest of the World region as major importers. The model computes how production, supply, demand, consumption, trade and price react, within the United States and the world, as variables in the system are changed.

Model Structure

Sugar supply or production ($qp_{i,t}$) is estimated as the product of the area harvested and the yield per hectare, where the area harvested ($a_{i,t}$) is expressed as a function of expected prices of sugar (p_{t-1}), alternative crops (p^c_{t-1}), and policy parameters (g_t):

$$a_{i,t} = f\,(a_{i,t-1}, p_{t-1}, p^c_{t-1}, g_t) \qquad (1)$$

Additionally, a lagged dependent variable ($a_{i,t-1}$) is included to provide for dynamics related to producers' cropping decisions, and finally *i* indexes for cane sugar or beet sugar. For each region, the model calculates total consumption of sugar (qd_t) as the product of per capita consumption and population. Per capita consumption (fd_t) depends on the price of sugar (p_t), per capita disposable income (cy_t), and a time trend variable (t) to provide for changes in tastes and preferences of consumers:

$$fd_t = g\,(p_t, cy_t, t). \qquad (2)$$

Carry-out stocks equations (qs_t) are calculated as function of domestic production (qp_t), price (p_t), and carry-in stocks (qs_{t-1}). These stocks protect against unexpected reductions in production and therefore, depends on the level of domestic production and the opportunity cost of storing sugar (Koo):

$$qs_t = h\,(qs_{t-1}, qp_t, p_t). \qquad (3)$$

The sum of domestic production (qp_{t-1}) and carry-in stocks (qs_{t-1}) represents domestic supply and the sum of domestic consumption (qd_t) and carry-out stocks (qs_t) is total demand. Net exports (qx_t) are then estimated as the difference between domestic supply and total demand, and a market equilibrium condition is expressed as:

$$\sum_{n=1}^{N} qx_t^n = 0 \text{ , n = 1,2,...,17.} \tag{4}$$

From this equilibrium condition the equilibrium world price of sugar is calculated and expressed into domestic price for each region using official exchange rates. Finally, the sugar wholesale price in each region is computed as a function of the world market price in domestic currency and expressed in real terms (Benirschka, Koo, and Lou).

The Base and Alternative Scenarios

The base and two alternative scenarios are developed to evaluate the impact of trade liberalization policy alternatives on the U.S. industry and world price. The base and alternative models are presented as follows.

Base scenario. The base-line case includes the expected sugar imports from the Central American Free Trade Agreement (CAFTA), 107,000 MT (Koo, Taylor, and Mattson), and includes implementation of NAFTA, but with limited imports from Mexico. Average climate conditions and historical rates of technological change are assumed. Additionally, it is assumed that current agricultural policies will be continued in all countries. The price of sugar in all regions is assumed to be endogenous; however, the price of other crops is exogenous.

Forecasted exogenous prices and assumptions of gross domestic product (GDP) growth rates, interest rates, exchange rates, and inflation rates, were obtained from the FAPRI World Agricultural Outlook (FAPRI, 2005).

Scenario 2. The EU partially liberalizes its sugar industry by implementing some of the changes proposed in 2004, while the other countries maintain their current policy programs. Under this scenario, the price of refined sugar was reduced from € 632 to € 421 (758 to 505 U.S. dollars) per metric ton, production quota decreased from 17.4 million MT to 14.9 million and new member countries were treated as old members.

Scenario 3. The EU, China, Japan, and the U.S. partially liberalize their sugar industries under the current WTO-DDA. For this scenario, variations in the model include the proposed changes from the EU, included in scenario 2, plus a 20 percent cut in tariffs and 20 percent increase in import quotas from China, Japan, and the United States. Policies in all other countries were assumed to remain constant, with limited U.S. sugar imports from Mexico.

Impact on the U.S. Sugar Industry and World Price

Table 1 presents the results of the simulation model under the base and alternative scenarios for the United States and the Caribbean sugar price, which is a reference for the world price. During 2004, U.S. sugar production was 4.4 and 4.1 million short tons (ST) from beet sugar and cane sugar, respectively. Total consumption was 9.9 million ST and net imports accounted for 1.4 million ST. Prices in 2004 were 40 and 27 dollars per ST of sugar beets and sugar cane, respectively, while the wholesale sugar price was 26.15 cents per pound. The Caribbean price was 8.4 cents per pound in 2004.

For the year 2013, the base scenario projects an increase in beet sugar and cane sugar production of 7.5 and 6 percent, respectively. Production is estimated at 4.7 million ST for beet sugar and 4.4 million for cane sugar. Net imports are expected to be 1.7 million ST, which represents an increase of 17 percent when compared to levels in 2004. As more sugar is available in the U.S. market, the model also projects a total volume of sugar consumption of 10.7 million ST, an 8.1 percent increase. Sugar beets and sugar cane prices are expected to increase by 1 and 3 percent, respectively; however, the wholesale sugar price in the U.S. is expected to be 24.89 cents per pound, 5 percent lower than the 2004 level.[1] The Caribbean sugar price from the base scenario in 2013 is expected to be slightly higher (3.6 percent) than the price in 2004.

Limited liberalization of the sugar industry under the EU proposal (scenario 2)

In this scenario the EU reduces the intervention price of sugar from 758 to 505 U.S. dollars per metric ton, and production quota falls from 17.4 million MT to 14.9 million MT. Table 1 shows that U.S. beet and cane sugar production are projected to increase, but by only about 0.1 percent, when compared to the base line scenario. Consumption will increase by only 0.1 percent and net imports will remain at the same level of the base line scenario. Prices in the United States will decrease to 40.15 dollars per ST for sugar beets and to 27.56 dollars for sugar cane, representing a decrease of 0.5 and 0.6 percent, respectively. Also, the wholesale sugar price in the United States is projected to decrease by 0.6 percent to 24.74 cents per pound. In contrast, the world price is expected to increase about 14.5 percent from 8.7 cents to 9.96 cents per pound; mainly because the proposal will reduce EU sugar exports while the world demand remains unchanged.

In general, results from this scenario suggests that the proposed EU reform will increase Caribbean price, but will not significantly affect the U.S. sugar industry. Under this policy it is expected that sugar exports from the EU will decrease and consequently sugar imports will increase. Therefore, the world sugar market adjusts to these changes in the EU and the world price becomes higher than the base line scenario.

Limited liberalization under WTO-Doha in selected countries (scenario 3)

This scenario includes the proposed changes from the EU, plus 20 percent reduction in sugar tariff and 20 percent increase in import quotas from China, Japan, and the United States. However, U.S. imports from Mexico under NAFTA are limited. When compared to the base line scenario, results from table 1 show that beet and cane sugar production are expected to decrease by 1.0 and 0.8 percent, respectively. Total consumption is projected to increase by about 0.9 percent. However, freer trade policies will increase U.S. imports by 15.4 percent up to a volume of 1.9 million ST. Prices are expected to decrease to 38.96 and 26.43 dollars per ST for sugar beets and sugar cane, respectively. This change in price represents a reduction of 3.4 percent for sugar beets and 4.7 percent for sugar cane. In addition, wholesale sugar price in the United States is expected to decrease by 4.4 percent to 23.79 cents per pound. Higher sugar supply in the United States from increased imports, compared to a relatively small increase in sugar consumption, will cause a reduction in the price of sugar. In contrast, the world sugar price is projected to increase to 12.1 cents per pound, a 39 percent increase over the base line scenario, because increased imports from consuming countries stimulates world demand for sugar while supply of sugar remains unchanged.

The increase in the Caribbean price of sugar may stimulate some changes from major sugar players in the world. Table 2 presents changes in production, consumption, and trade in selected countries under the WTO-Doha scenario. Results indicate that Brazil will increase production and exports substantially. Total value of exports from Brazil, evaluated at 12.1 cents per pound, will increase by about 2.9 billion U.S. dollars. For Thailand and Australia, export revenues will increase by 0.46 and 0.31 billion U.S. dollars, respectively. The EU, India, and China are expected to increase imports significantly, while Japan and the United States are likely to have moderate increases in imports.

Although some countries (low cost sugar producers) will benefit from a higher world sugar price, some world producers could be seriously affected, as sugar traded under preferential agreements with the EU and the United States will be valued at a lower price.

Welfare effects

In order to evaluate the welfare effects, changes in consumer and producer surpluses were estimated for the EU and the Doha scenarios. Because of differences in the price elasticity of supply between sugar beet and sugar cane producers (Koo; Benirshka, Koo, and Lou), producer surpluses for sugar beet and cane are presented (table 3).

Both of the scenarios resulted in a reduction in the wholesale sugar price and a reduction in the prices of sugar beets and sugar cane. From this outcome it is expected that consumer surplus increases, while the opposite occurs for producer surplus (table 3). When compared to the base line scenario, the value of consumer surplus increases by 4.1

million dollars for the EU scenario and 30.9 million dollars for the Doha scenario. In contrast, the value of producer surplus decreases by 1.6 and 12.1 million dollars for the EU and Doha scenarios, respectively. The total welfare change in both scenarios is positive, 2.7 million dollars for the EU scenario and 18.9 million dollars for the Doha scenario. The effect of the WTO-Doha scenario is significantly larger than that of the EU scenario.

Under the WTO-Doha circumstances, reductions in sugar production are very likely to occur in the United States and production of sugar-competing crops could be increased as some land is removed from sugar production. However, the effect of changes in production of competing products are expected to be very small (Koo).

In terms of the sugar program, the reaction from the U.S. Government to provide for the loses in producer surplus, under the WTO-Doha scenario, is unknown. One alternative could be to reduce allotments of sugar production to maintain domestic sugar prices at a desirable level. Another alternative is to assist the sugar industry by providing income support to producers or assistance packages for diversification.

Conclusion

In April 2005 the WTO-appellate body decided to uphold the decision made in August 2004, which ruled the EU sugar exports as illegally subsidized. Before this decision was made, in July 2004, the EU proposed a reform of its sugar policy, which is expected to be published during June 2005. The changes are oriented to make the sugar sector more competitive and will frame the EU position for the WTO-DDA negotiations in Hong Kong in December 2005. The reform includes a significant reduction of the intervention sugar price and reduction in the production quota (Kelch and Normile;

European Commission (a)). Additionally, under the WTO-DDA substantial improvement in market access is being discussed to be applied to all agricultural products, including sugar. The framework calls for elimination of export subsidies and for the elimination of export credits with repayment periods beyond 180 days and export guarantee programs. This study utilizes a simulation model (Benirschka, Koo, and Lou), in which the potential reforms of the EU and some liberalization policies under the Doha agenda proposal were evaluated to analyze their impact on the U.S. sugar price and the consequences on producers and consumers. Results from these alternative policies are compared to those from a base line scenario.

Our results agree with previous research by Koo; Beghin et al.; Haley; U.S. General Accounting Office; Borrell and Pearce; Wohlgenant; and Milner, Morgan, and Zgovu. For the base line scenario, it is assumed that current agricultural policies will be continued in all countries. Projections for the year 2013 indicate an increase in the production of beet sugar and cane sugar production by 7.5 and 6 percent, respectively. Net sugar imports will increase by 17 percent and consumption is also expected to increase by 8.1 percent. Consequently, the U.S. wholesale sugar price is expected to decrease by 5 percent.

Under scenario 2, the EU reduces the intervention price of sugar and the production quota is decreased from 17.4 million MT to 14.9 million MT. In general, results from the model indicate that if these reforms are implemented by the EU, the Caribbean sugar price will increase from 8.7 to 9.96 cents per pound a 14.5 percent increase, but would have little effect in the U.S. sugar industry.

The WTO-Doha scenario includes sugar policy reforms in the EU plus a 20 percent cut in import tariffs and a 20 percent increase in import quota in China, Japan, and the United States. Under these circumstances, U.S. sugar imports will increase by 15.4 percent; however, sugar production is not expected to be affected significantly. Sugar beet and sugar cane prices are projected to decrease by 3.4 and 4.7 percent, respectively. Also, the U.S. wholesale sugar price will decrease by 4.4 percent to 23.79 cents per pound. In contrast, the world sugar price is projected to increase to 12.1 cents per pound, a 39 percent increase.

U.S. consumer and producer surplus changes were estimated for the EU and the WTO- Doha scenarios. The total welfare change in both cases is positive; however, the effect is significantly larger for the Doha case. Implementation of the Doha scenario may increase social welfare in the United States, but because of reduced prices, the policy may affect some producers in the United States.

With a higher Caribbean price under the Doha scenario, Brazil will benefit most, as production and export sales increase. Thailand and Australia are also expected to experience moderate increases in production and exports. EU, India, and China are expected to increase imports substantially. The United States and Japan will increase imports moderately.

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Table 1. Sugar price, production, consumption, and net imports under the base and alternative scenarios in the United States

Region	Category	Units	Actual 2004 Levels	2013 Projections		
				Base Line [a]	EU	WTO-Doha
United States						
	Beet Sugar Production	1,000 ST [b]	4,358	4,683	4,685	4,636
	Cane Sugar Production	1,000 ST	4,120	4,367	4,369	4,333
	Total Consumption	1,000 ST	9,905	10,703	10,716	10,803
	Net Imports	1,000 ST	1,429	1,670	1,670	1,927
	Sugar Beets Price	Dollars/ST	40	40.34	40.15	38.96
	Sugar Cane Price	Dollars/ST	27	27.73	27.56	26.43
	Wholesale Sugar Price	Cents per Lb	26.15	24.89	24.74	23.79
World	Caribbean Price	U.S. Cents per Lb	8.4	8.7	9.96	12.1

[a] Base line = scenario 1; EU=scenario 2; and WTO-Doha = scenario 3.

[b] ST = short tons.

Table 2. Production, consumption, and trade in selected countries under the base and WTO-Doha scenarios

Country	Production		Consumption		Trade [a]	
	1,000 Metric Tons		1,000 Metric Tons		1,000 Metric Tons	
	Base Line [b]	WTO-Doha	Base Line	WTO-Doha	Base Line	WTO-Doha
Australia	5,391	5,430	1,337	1,336	4,054	4,093
Brazil	33,039	38,089	11,582	11,582	21,458	26,509
China	10,706	10,865	14,371	15,628	-3,685	-4,761
European Union	18,834	15,096	17,526	17,526	1,293	-2,444
India	21,044	21,165	21,693	25,047	-684	-3,939
Japan	892	795	2,397	2,518	-1,503	-1,721
Mexico	6,239	6,289	5,824	5,821	-405	-460
Thailand	8,237	8,310	2,332	2,330	5,888	5,963
United States	8,236	8,162	9,740	9,831	-1,520	-1,754

[a] Negative values indicate net importers.

[b] Base line = scenario 1; and WTO-Doha = scenario 3.

Table 3. Changes in consumer and producer surplus from the base to EU and Doha scenarios in the United States

Category	EU (1,000 Dollars)	WTO-Doha (1,000 Dollars)
Consumer Surplus	4,066	30,916
Producer Surplus	-1,632	-12,072
Beet Producer	-890	-6,421
Cane Producer	-742	-5,651
Total Change	2,704	18,844

[a] EU=scenario 2; and WTO-Doha = scenario 3.

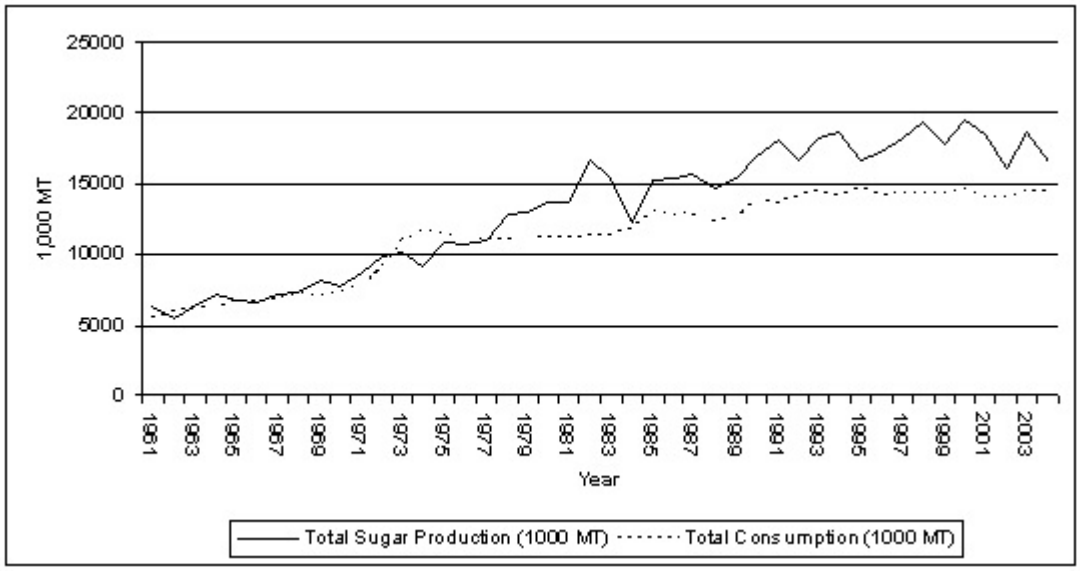

Figure 1. Total sugar production and consumption in the EU (1960-2004)

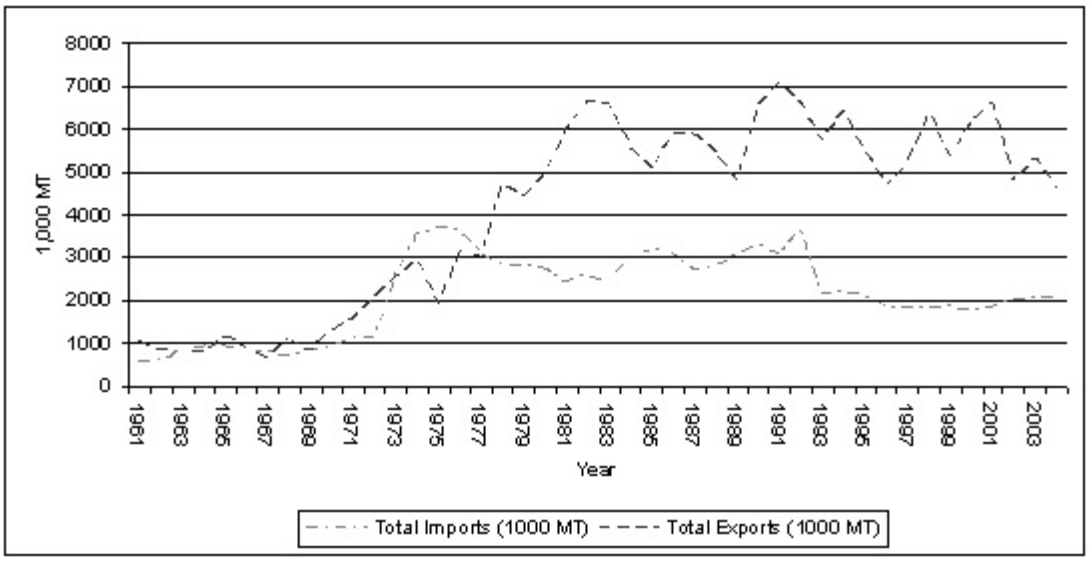

Figure 2. Total sugar imports and exports from the EU (1960-2004)

1. The reduction in the wholesale sugar price was expected as additional sugar is suplied from increased imports and production. Although, the increase in sugar beets and sugar cane prices is marginal, the direction of this change was not expected. This result can be explainned as an effect of increased efficiency of U.S. sugar processing plants during the last years. Regardless of the wholesale sugar price, sugar beets and sugar cane prices have remained stable or slightly increasing, mainly as a consequence of lower operating cost in sugar plants.