

Competition and Complementarity in Agriculture between Cuba and Florida: The Case of Sugar¹

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Abstract

This paper examines a hypothetical framework for future U.S.-Cuban sugar relations to explain the competition and complementarity issues that both countries will face once trade and commercial relations are resumed. Its objective is to identify and examine alternative policy options that would minimize competition and be equitable, and to emphasize the opportunities for complementarity in trade and investment. A few sections from the authors' previous papers are summarized and updated, and new material is included.

Preface

Cuba has entered into a process of economic reform that, combined with other factors, may lead to the restoration of diplomatic and commercial relations with the United States. Given the striking similarity between historical agricultural production patterns in Cuba and Florida, and the extensive volume of agricultural trade between the United States and Cuba before 1960, agricultural producers and processors in Cuba, Florida, and throughout the

United States are likely to face both challenges and opportunities if, and when, U.S. economic sanctions against Cuba are lifted.

In an effort to provide timely information on this important potential policy issue, the International Agricultural Trade and Development Center (IATDC) of the Department of Food and Resource Economics at the University of Florida has initiated a comprehensive research project to study Cuba's agricultural and fisheries sectors. The project does *not* address the question of whether commercial relations between the United States and Cuba should be resumed. Rather, the research is designed to provide objective and current information on these sectors in Cuba and Florida for Federal and State legislators, government agencies, private firms, consumer groups, and others to draw on for discussion and debate should the issue arise.

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The first step in this research was the identification of potential commodities, or groups of commodities, that would be likely candidates for trade or investment once commercial relations between the two countries are resumed. Five groups were identified

- sugar;
- citrus—grapefruit, lemon, *lima*, orange and tangerine;
- vegetables—cabbage, *calabaza* (pumpkin), cucumber, garlic, lettuce, onion, pepper, plantain and tomato; roots and tubers—*boniato* (sweet potato), *malanga* (taro), potato and *yucca* (cassava);
- tropical fruits—avocado, coconut, guava, mango, papaya and pineapple;
- fisheries and aquaculture.

The second step was to conduct a thorough diagnostic of each of these commodity sectors in Florida and Cuba. These diagnostic studies provide the bases for the third and final step of the research—preparation of a series of publications that make preliminary assessments of potential competition and complementarity between Cuba and Florida if economic sanctions against Cuba are lifted.

Previous research (Alvarez, 1992; Alvarez and Peña Castellanos, 1995; and Peña Castellanos and Alvarez, 1996) contains a diagnostic of the sugarcane sub-sector of the sugar industries in Cuba and Florida, along with some preliminary work on the competition and complementarity issues (Alvarez and Peña Castellanos, 1996). Other research (Peña Castellanos and Alvarez, 1997) completed the diagnostic phase of the project for sugar by examining sugar processing sub-sectors in both Cuba and Florida, and contains some general and specific analyses concerning the competition and complementarity issues.

Introduction

Of the group of commodities studied under this project, sugar is perhaps the most politically sensitive commodity for three primary reasons

- Despite advances toward liberalized trade in recent U.S. legislation and international trade agreements, sugar remains a highly protected and subsidized commodity in the United States, as well as in most producing countries of the world;
- The need for the former U.S. sugar quota allocation for Cuba (about three million metric tons at the time of its suspension in July 1960) disappeared because of the tremendous growth in the use of high fructose corn syrup (HFCS), the expansion of the U.S. sugar industry, and the decrease in imports from U.S. friendly countries. Therefore, any attempt at restoring part of the Cuban quota is likely to face opposition since it may affect U.S. domestic producers and/or producers in the 40 countries presently exporting sugar to the United States under the current U.S. Sugar Program; and
- For the Cuban government, the benefit of participating in the U.S. Sugar Program through changes in current quota allocations would need to be evaluated within the context of its political and economic relations with “third world” countries at that time.

The debate on the future of U.S.-Cuban sugar relations, however, should not concentrate on those issues only. The objective of this paper is to examine alternative policy options to explain the competition and complementarity issues that both countries will have to face once commercial relations are resumed. In addition, the authors want to consider ways to minimize competition, while ensuring equitability, and to emphasize the opportunities for complementarity in trade and investment. It is in this spirit that much of this paper has been written.

The next section of this paper briefly describes previous sugar research, updates some of the research, and presents new information. Because of the nature of this project, some sections will refer exclusively to Florida-Cuba issues, while other sections will refer to the entire United States since the sugar industry is national in scope.

Previous Sugar Research by the Authors

Perhaps the United States and Cuba were never closer to resuming diplomatic and commercial relations than during the Carter Administration in the late 1970s. During that time, the senior author of this paper wrote a manuscript entitled "Politics vs. Economics in International Trade: The Case of Cuba-U.S. Sugar Relations" (Alvarez, 1978). That publication ended with the following statement:³

The basic economic principles of supply and demand and comparative advantage tell us that both countries should restore their commercial relations (Cuba's proximity to the U.S. would also mean a significant reduction in transportation costs). Thus, opposing the resumption of relations (which seems a likely fact in the near future anyway) is not the right approach. The best thing to do would be to suggest, based on research conducted with the available data, appropriate measures to avoid unfair competition. The result would help minimize the influence of politics in the Politics vs. Economics dilemma (p. 13).

Since U.S. access to data on Cuba has been limited, the idea of establishing a collaboration between the Department of Food and Resource Economics at the University of Florida and a similar Cuban institution began to develop in the 1980s. Unfortunately, the project was interrupted when conversations between the two countries broke off. However, after several more attempts (that did not materialize for a number of reasons), the current project was finally established in 1993.

In the meantime, the Florida researcher involved in the project continued to research issues related to the topic being discussed. Using the Cuban sugar industry as an example, a working paper (Alvarez

and Alvarez, 1991a) explained how commodity-linked transactions can be used to obtain funds on more favorable terms than would have been possible otherwise. That paper was later presented at the First Annual Meeting of the Association for the Study of the Cuban Economy (ASCE) (Alvarez and Alvarez, 1991b).

Alvarez (1992a) wrote a working paper on the Cuban sugar industry, in general, and the prospects for Cuban sugar exports in the 1990s. That publication was summarized and updated for the ASCE's second annual meeting (Alvarez, 1992b).

The first official sugar publication under the collaborative agreement between the University of Florida and the University of Havana was a working paper that contained both a diagnostic of the sugarcane industries in Cuba and Florida and a discussion on the world sugar market as it relates to both producing areas (Alvarez and Peña Castellanos, 1995). One section of that working paper was presented at ASCE's fifth annual meeting (Peña Castellanos and Alvarez, 1995) and was summarized and updated for *Agriculture and Human Values* (Peña Castellanos and Alvarez, 1996). Another section related to the issue of the U.S. Cuban sugar quota was reworked for the *Journal of International Food and Agribusiness Marketing* (Alvarez and Peña Castellanos, 1996).

The second joint sugar publication was a working paper containing a diagnostic of the processing sector of the industries in Cuba and Florida (Peña Castellanos and Alvarez, 1997).

This, the third and final joint sugar publication, deals with the competition and complementarity between Florida and Cuba. No other projects are being developed at this time between the two academic institutions.

Prospects for the Sugar Agro-Industrial Sectors

The Case of Cuba

The Process of Economic Reform in the Sugar Sector

Economic reform in the Cuban sugar agro-industry began with a series of reforms that targeted the agricultural sector. The basic problem faced by the Cuban leadership at the beginning of the 1990s was how to react and maintain productivity under severe restrictions of resources. The first answer to that challenge was to restructure and implement a new form of management and enterprise organization that would lead to a more efficient use of scarce resources. The second answer was to open the sector to foreign capital.

Unidades Básicas de Producción

Cooperativa (UBPC). The basic units of cooperative production—Law Decree No. 142 of 20 September 1993—established the Unidades Básicas de Producción Cooperativa (UBPC). The goals of the UBPC were (a) to achieve a closer relationship between man and the land; (b) to channel the cooperative efforts of the workers and their families to improve the living conditions of the collective, including self-sufficiency; (c) to closely and rigorously relate workers' earnings to production; and (d) to develop the autonomy of the collective's resource management with the objective of achieving self-sufficiency in the productive process (MINAZ, 1993, p. 3).

Once the establishment of UBPCs in sugarcane agriculture was approved, an accelerated process of change took place in the sector. By the end of 1993, practically all state lands devoted to sugarcane production had been reorganized under this new form of management and direction, and more than 98 percent of the sugarcane agricultural workers had become cooperative members.

The opening of the sector to foreign capital. A second important aspect of the economic reform was the opening of the agro-industrial sector to foreign capital investment. In reality, since 1982, when Law-Decree No. 50 was enacted, there already existed

a legal framework for the establishment of economic ties between the Cuban government and foreign capital. However, it was not until 1990 that provisions of this law were expanded in scope. In September 1995, the National Assembly approved Law No. 77, which authorizes and governs all activities related to the action of foreign capital in the Cuban economy.

In the particular case of the sugar agro-industrial sector, the concrete arrangements with respect to foreign capital only allowed the establishment of investment agreements for financing the production and commercialization of sugarcane derivatives. In 1994, facing the scarcity of available resources and the difficult situation of the sugar sector, some restrictions were eliminated and the sector, in general, was opened to foreign associations. However, although some information is available, there are insufficient data to provide a thorough synthesis of that process for the sugar agro-industry.

The agro-industrial sector clearly is of interest to foreign investors. It is known that Cuban governmental institutions have been involved in agreements of diverse nature with firms from Great Britain, the Netherlands, Spain, etc., which implies economic commitments in the agricultural and/or industrial branches of this sector.

Until now, the most important form of foreign capital participation in the sugar agro-industrial sector has been through financing sugar production at regional levels (financing inputs). Financing agreements are granted annually, although it would be feasible to negotiate five-year agreements.

For example, for the 1995-96 campaign, nine of the 13 sugarcane-producing provinces received agricultural credits from foreign companies for agricultural production requirements totaling more than US\$130 million (Nodal, 1996). In addition, another US\$160 million was devoted to the more important necessities of industry, transportation, and other *zafra* activities (Financiamiento, 1996).

Under this plan, agreements established with foreign capital presuppose that the principal, interest, and a portion of the profit will be paid in physical sugar, based on production increases above the average production level in recent *zafras* and world

market sugar price fluctuations. According to the Cuban leadership, although such financing agreements for sugar production have been arranged under very harsh credit conditions for the Cuban economy, they are necessary due to the scarcity of resources and the current situation of the sugar agro-industrial sector (Lage, 1995).

Future Prospects

The future of Cuba's sugar agro-industry will be determined by a large number of internal and external factors, whose influences will vary according to the time frame within which they are estimated (short-, medium- or long-run). This section concentrates on the short- and medium-run time frames.

During the period 1986-90, Cuba maintained an average annual export level of 6.89 million tons of sugar. On average, approximately four million tons were sent to the former Soviet Union each year during this period. In a time frame of five to eight years, external demand does not appear to be a limiting factor for the exportation of a similar volume of Cuban sugar. In that regard, one must take into account the following factors

- World sugar consumption increased at an annual rate of about two percent from the beginning of the 1980s until 1993. During 1993-94, consumption declined abruptly. The fall was due, in part, to reductions in sugar consumption in the countries of Eastern Europe and the former Soviet Union (Lord, 1995). It is precisely the Russian Federation, along with other nations that were part of the former U.S.S.R., that were the principal markets for Cuban sugar exports. It is anticipated that such markets will gradually recover and will be able to absorb annual volumes close to three million tons of Cuban sugar, at terms that are advantageous for both trading partners and within a barter framework; and
- During 1981-95, world sugar exports maintained an annual average level of 30 million tons, with very little relation to price levels and the increase in consumption. It can be assumed that, in the short-run, the

sugar volume in the world market will be maintained in the range of 27 to 32 million tons.

On one hand, this suggests, fundamentally, the existence of a more or less stable demand for Cuban sugar in the Russian, Asian, Canadian, African, and Middle Eastern markets. On the other hand, if the volumes of world sugar imports remain stable, it is unlikely that Cuba can expect high increases in the demand for its sugar.

Therefore, in the short-run, the restrictive factor of the Cuban sugar agro-industry does not appear to be an external demand. (At the present time, given the level of deterioration of its sugar industry, Cuba cannot satisfy the existing demand.) Rather, it is the scarcity of resources in the sector that restricts its ability to increase its productive efficiency to become competitive under the conditions of world market prices. Even though it is often argued that very few countries can truly be competitive at world sugar market prices, one cannot overlook the fact that a particular price has to be considered as a reference price, especially under conditions of acute scarcity of resources.

During the period 1980-94, monthly prices in the world sugar market averaged 10.71 cents/pound, which places the average price of a metric ton of sugar for this long period at US\$236 (Alvarez and Peña Castellanos, 1995). During the years 1986-90, years in which Cuba's sugar sector still had adequate available resources, total production expenses for one ton of Cuban sugar were evaluated at 448 Cuban pesos (MINAZ, various issues). According to the official Cuban exchange rate of 1 peso = 1 US dollar, that is 90 percent above the world market price.

With the available data, it has been impossible to calculate the average total cost of a metric ton of raw Cuban sugar in convertible currency. Although, in the last few years, estimates have ranged between US\$120 and US\$160 (51 percent and 68 percent, respectively, of the world market's average price per ton) (Lage, 1996).

Based on this information, it becomes evident that increasing the productive and economic efficiency of the Cuban sugar agro-industrial sector is

a necessity. Furthermore, it is important to remember that the barter agreements between Cuba and the Russian Federation (the most important Cuban sugar market) are based on prices in the world sugar market, which force the sugar sector to become more and more competitive.

The greatest potential for the sugar agro-industry to increase its efficiency may be to increase its agricultural yields, which, given the edaphic and climatic conditions of the country, have always been below the potential levels (Alvarez and Peña Castellanos, 1995, pp. 3-6). At the same time, increasing the agricultural yields is necessary to delineate the manner in which the restructuring of the sugar agro-industry will take place, according to the demand conditions and resources of the sector.

In fact, the extensive growth model applied to the sugar industry created the potential for annual sugar production volumes above 10 million metric tons for Cuba (assuming national agricultural yields close to 66 metric tons per hectare and industrial yields of 10 percent). However, it does not appear prudent to assume the existence of export markets above six million metric tons (once previous unfulfilled commitments have been delivered). Adding this six million metric ton potential export figure to an internal consumption volume of one million metric tons will generate a total production level of seven million metric tons. Based on this figure, if agricultural yields are increased sufficiently, then it would be feasible to reduce the agricultural area devoted to sugarcane production. A simple estimation, for example, suggests that it might be possible to decrease the amount of land allocated to sugarcane production by more than 20 percent.

At the same, such a reduction in agricultural area would compel a restructuring of the industrial processing capacity of the sector. At present, there are 156 sugar mills in Cuba that milled an annual average volume of 71 million tons of cane annually between 1986 and 1990. This represents the under-utilization of an average daily milling capacity of more than 15 percent, assuming *zafras* of 150 days and an average industrial capacity of 85 percent (MINAZ, various issues).

Under these assumptions, the daily grinding capacity of the country could be reduced by 15 percent without affecting the necessary grinding capacity for *zafras* of 7.5 million tons. In fact, of the total mills in Cuba, 16 percent have a daily milling capacity below 2,300 tons (the average is about 4,200 tons). In the majority of cases, the economic efficiency of these small mills has been questionable (Larson and Torres Martínez, 1995).

Therefore, the process of restructuring the sugar agro-industrial sector would be closely tied to its technological reconversion, especially in terms of energy-generating capability (Peña Castellanos and Alvarez, 1997). Such a restructuring would generate multiplier effects throughout the entire economy of the country and produce beneficial effects on its balance of trade and payments.

Finally, looking briefly at a long-run perspective, the Cuban sugar agro-industry is facing the same challenges faced by all sugar industries of the world; that is, relative reduction of sugar demand, competition from natural and artificial sugar substitutes, influences of technological changes in the sector, alternative energy balance, the necessity to diversify the sector's production, etc. Such aspects cannot be overlooked during the process of reincorporating Cuba's sugar agro-industry into the present and future structure of the global economy. It is for that reason that the redesigning of the Cuban sugar agro-industrial sector must be approached as a dynamic and ongoing process.

The Case of Florida

Florida's sugar agro-industry is also analyzed from short-, medium- and long-term perspectives. After three decades of continuous growth, Florida's sugar industry may have now reached a plateau. Several factors seem to indicate not only that further expansions are unlikely, but also that the industry may experience some contractions in the short- and long-run.

First, further acreage expansions are now restricted by the lack of available muck lands in the cane-producing areas of Florida. Building new mills on sand lands (where some expansion has taken place in the last few years) is a remote possibility since the

heavy capital investment required is unlikely to materialize in times of uncertainty. Furthermore, Glaz reported that in 1993, 32.3 percent of the plant cane was fallowed planted, while 67.6 percent was successively planted (1994, p. 41), leaving little room for acreage expansion due to this practice.⁴

Second, environmental concerns may very well be a source of industry contraction. Under the settlement agreement between the United States and the South Florida Water Management District, the latter was required to purchase 34,700 acres of land in the Everglades Agricultural Area (EAA) to be used for filtering phosphorus from drainage waters before the water enters the Water Conservation Areas and the Everglades National Park. These Stormwater Treatment Areas (STAs) will take away about 26,100 acres that were in cane production in 1991 (Hazen and Sawyer, 1992, p. ES-2). This fact alone represents an acreage reduction of 5.7 percent. Furthermore, studies are underway at the federal level to explore the possibility of the EAA's "full ecological restoration." If implemented, such restoration would translate into the flooding of thousands of acres now in sugarcane production in the EAA (Science Sub-group, 1993). The results (actual amount of land required for any proposed restoration) of these studies are unavailable. Alternative production practices are being researched and tested.

Third, the subsidence of organic soils will further reduce industry acreage as time progresses. It has been predicted that "by the year 2000 there will be only about 80,000 acres of soil 3 feet or deeper; i.e., typical of the soil depths to which growers have adapted their crop management systems...[and] there probably will be over 500,000 acres of organic soil 3 feet or less in thickness, and half of this will be less than a foot in depth" (Snyder *et al.*, 1978, p. 20). However, industry contraction may be slowed down with the adoption of new management practices such as the use of higher water tables and cultivars that can tolerate flooding for long periods of time. This research is being conducted at present.

Fourth, there are also new pressures on the income side of the equation

- growers are already paying a \$3.50/acre self-imposed tax to their Environmental Protection District and around \$25/acre to help clean the Everglades,
- the implementation of Best Management Practices (BMPs) is adding \$10/acre for five years, in addition to fees for water permit applications, water sampling and reporting, marketing access and compliance costs, and
- the new 1996 Farm Bill included the freezing of the raw cane sugar national average loan rate at the current 18 cts/lb, no minimum price guarantee under conditions of recourse loans which may lead to more volatile prices on the downside, an increase of one percent in commodity loan interest rates by the CCC, and an increase in the assessment on sugar marketing from 1.1 percent to 1.375 percent of the raw sugar loan rate for sugarcane processors (Alvarez and Polopolus, 1996).

Finally, there are issues related to international trade such as NAFTA, GATT/WTO, and others discussed in previous publications, and summarized in the next section, that may adversely affect the Florida sugar industry in the long-run.

On the positive side, the recent dramatic increase in mechanical harvesting to 100 percent of the crop represents a savings of approximately \$4.50/gross ton of the cane harvested. At the factory level, technological improvements have enhanced mill efficiency, which translates into improved sucrose extraction rates and the total use of bagasse as an energy source.

In summary, through technological changes, the Florida sugar industry has demonstrated its ability to adapt even under a protective political environment. It is anticipated that, despite tremendous challenges, Florida growers and processors are prepared to face the economic realities of what promises to be a very competitive 21st century.

The Competitive Issue

The first of the joint papers on sugar (Alvarez and Peña Castellanos, 1995) contained a section entitled "Potential of the World Sugar Market" (pp. 54-73). Some of the sub-sections included topics such as background and definition of the world "free" market, trends in selected world sugar parameters (supply and demand, production and consumption, ending stocks, stocks to consumption ratios, and prices), world sugar trade, and growth in caloric and artificial sweeteners.

A review and update of these sections are unnecessary since figures and trends have remained more or less the same. The last sub-section dealt with the potential impact of trade agreements. After discussing the failure of previous International Sugar Agreements (ISA), the paper discussed the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT). The last two agreements deserve brief consideration since they have the potential to impact future U.S.-Cuban sugar relations in the competitive arena.

The analysis of the NAFTA ended with the following summary:

... NAFTA reinforces the status quo. The integrity of the U.S. Sugar Program is guaranteed as well as the tariff rate quota system benefiting 39 other friendly countries (p. 71).

It should be remembered that NAFTA became effective on 1 January 1994. According to the terms of NAFTA, if by the seventh through fourteenth year, Mexico becomes a net surplus sugar producer, as defined in the Side Agreement, it will have duty-free sugar access to the U.S. market for the amount of its surplus up to a maximum of 250,000 tons, with minimum duty-free access still at the minimum "boat-load" amount (Polopolus *et al.*, 1994, p. 2). The current expansion of the Mexican sugar industry is important because the success of the Mexican sweetener industry would not only close the Mexican market to imports, but also jeopardize the degree of Cuba's participation in the U.S. Sugar Program.

In addition, one has to consider current efforts to incorporate the rest of the Americas under NAFTA, under the Free Trade Area of the Americas (FTAA) initiative. Although recognizing that a considerable amount of time will elapse before full implementation, the impact on Cuba may vary if the current U.S. economic sanctions against Cuba persist or, depending on how sugar trading is considered, under any new agreements.

The evaluation of the GATT stated

In summary, while liberalizing world trade moderately over a long term horizon, the new GATT will not have much impact in the immediate future on either world sugar trading patterns or world raw sugar prices. However, by the turn of the century, this agreement will begin to affect production patterns somewhat. More importantly, GATT has placed an upper limit on future increases in protection... (p. 72).

Therefore, competition issues, not only between Cuba and the United States, but also between these countries and the rest of the world, will not begin to show until after the year 2000. Even under the current world trade scenario, there are two issues that need to be resolved between the U.S. and Cuba before sugar trading takes place. They include the problem of U.S. properties confiscated at the outset of the Cuban Revolution and the restoration of part of the former U.S.-Cuban sugar quota.

The Confiscated U.S. Properties

The problem of confiscated properties of U.S. citizens at the beginning of the Cuban Revolution is a latent one in U.S.-Cuban relations. Much has been written about this topic since the early 1960s, and a thorough discussion of the issue is beyond the scope of this paper.⁵

Even under what seems to be an uncompromising legislation, temporary solutions to the problem appear to be feasible. For example, with the approval of the Clinton Administration, ITT announced on 24 July 1997 that it had entered into an agreement with the Italian communications firm Stet International to receive US\$25 million for the use of ITT-claimed property in Cuba for the next 10 years.

Although similar agreements could develop in the future, it is obvious that the issue of the claims of U.S. citizens on their former properties will have to be resolved in a permanent manner.

The U.S.-Cuban Sugar Quota

The Current U.S. Sugar Program

At the beginning of this section on the competition issue it was concluded that both NAFTA and GATT had reinforced the *status quo*. Therefore, under a scenario of resumed trade and commercial relations, the search for potential solutions to the problem of any U.S. sugar quota for Cuba must be addressed within the remaining policy framework under which U.S. sugar policy operates: the U.S. Congress and the Sugar Program in the Farm Bill.

The last Farm Bill, also known as the Federal Agriculture Improvement and Reform (FAIR) Act of 1996, became law on 4 April 1996. The sugar provisions of the new legislation will be effective for seven fiscal years (1997-2003), equivalent to the 1996-2002 crops. Although FAIR represents a major transformation in U.S. agricultural policy, the Sugar Program only experienced a few minor but nonetheless notable changes that move the domestic sugar industry slightly in the direction of freer more competitive markets (Alvarez and Polopolus, 1996).

Alternative Policy Options

The following U.S. policy options to restore part of the former Cuban sugar quota are based upon two assumptions: that the U.S. economic sanctions against Cuba have been lifted⁶ and that either before or after the U.S. economic sanctions are lifted, Cuba will have recovered its previous export capacity. (Cuba's sugar output—in million metric tons—in recent years has been 7.62 in 1991, 7.01 in 1992, 4.3 in 1993, 4.0 in 1994, 3.33 in 1995, 4.45 in 1996, and 4.2 in 1997.)

Policy Option #1

A potential source of sugar for allocation to Cuba would involve the return of the Cuban quota shares allocated to different countries in the 1965 amendment to the Sugar Act. Needless to say, those shares would represent percentages of current quota

allocations and not those existing in 1965. For reference, the entire minimum U.S. sugar import quota for all countries under current legislation (1.25 million tons) is only 21 percent of the six million tons imported in 1965, when the three million ton Cuban quota was redistributed among other countries.

This option, however, would only represent approximately 48,000 tons per year (using the 1991-92 example in previous publications), as compared to the three million ton quota Cuba lost in 1960. Updating that figure with the higher allocations for fiscal year 1997 brings about a small increase in the total to only 54,760 tons (USDA Sets, 1996, p. 10). This option would require minor changes in U.S. sugar legislation, would have negligible impact for Cuba, and would be negative for countries with quotas to export sugar to the U.S., many of which also maintain friendly relations with Cuba. The foreign policy complications of such an approach would not likely be favorable.

Policy Option #2

The second alternative would involve granting Cuba a quota for the difference between current quota allocations and actual imports delivered. The original examples, using the periods 1989-90, 1990-91, and 1991-92, resulted in differences of 127,060 tons, 72,112 tons, and 49,686 tons, respectively (ERS, June 1994, p. 58). Updating those figures to the 10/92 - 9/95 and 10/95 - 9/96 periods, gives TRQ shortfalls of 24,794 and 93,565 tons, respectively (ERS, June 1997, p. 39).

Policy Option #3

Finally, this policy option combines both increases in U.S. sugar consumption and decreases in domestic production. First, the provision in the old Sugar Act of allocating to Cuba almost all of the increases in U.S. consumption requirements could be temporarily enforced to open the U.S. market to Cuban sugar. The USDA has projected U.S. sugar consumption to rise about 100,000 tons per year from 1994 to 2000 (down from an average of 164,000 tons per year over fiscal years 1985-86 to 1994-95, ERS, December 1995, p. 3) due to population and per-capita use growth (Buzzanell, 1994, p. 7).

This policy option could also include increases in sugar quotas due to U.S. domestic production declines. For example, the USDA announced in November 1995 that the tariff rate quotas were increased by 300,000 metric tons to 1.56 million tons due to a lower than previously forecasted domestic beet sugar output (ERS, December 1995, p. 14). Additional similar adjustments in the quotas were made in fiscal years 1996 and 1997.

The feasibility and impact of this policy option are completely different than the previous ones. First, the inclusion of the old provision concerning new increases in U.S. domestic consumption may require a major change in U.S. legislation. That would not be the case for the sporadic increases in annual tariff rate quotas due to USDA adjustments. Second, it would represent Cuban sugar exports to the United States of at least 100,000 tons per year just from consumption increases, plus potential additional amounts from the USDA quota adjustments. Finally, it would pose no new burdens on domestic or foreign suppliers.

The Complementarity Issue

Despite the problems posed by competition under a highly protected environment, there seem to exist many opportunities for collaboration (trade and investment) between Cuba and Florida once U.S. sanctions are lifted. This section discusses some of the possible opportunities.

Cuba's Input Needs

Florida's sugar industry is not restricted to the production of raw and refined sugar. The industry also includes a wide network of suppliers who affect, and are affected by, the industry's performance. They include, among many others, suppliers of inputs such as fertilizers, pesticides, and other chemical products. Also important are sellers of machinery, equipment, and spare parts for the agricultural and industrial operations and consultants of various types.

For many years, and until the end of the 1980s, Cuban agriculture, in general, and the sugar industry, in particular, depended very heavily on the use of machinery and other inputs that were mainly supplied by the Soviet Union and Eastern European countries. For example, total volume of fertilizer imports

surpassed one million metric tons annually in the late 1970s and remained relatively stable through 1989. More than 10,000 metric tons of herbicides were imported annually by the end of the 1980s, along with another 10,000 metric tons of other pesticides per year. Machinery and equipment imports, after reaching a peak of 526 million Cuban pesos in 1984, remained stable at around 300 million pesos for the rest of the decade (Alvarez and Messina, 1992, pp. 1, 4, 7, 10).

The former figures may be used as rough estimates of Cuba's current needs and estimated future purchases after trade with the United States is resumed. In the longer term, producers and distributors of agricultural inputs in Florida could face a market several times larger than the one just described as obsolete equipment or equipment that was cannibalized for spare parts is replaced (Alvarez and Messina, 1992, pp. 14-15). The geographical proximity between Florida and Cuba suggests that input suppliers for Florida's sugar industry will reap most of the benefits from future trade of these products with Cuba.

Refining Cuban Sugar

Cuba has never been a large raw sugar refiner. The latest official statistics describe the status of this sector of the industry until 1989 (CEE, 1991, p. 155). During the 1980s, Cuba's 16 refiners had an average daily refining capacity of about 6,000 metric tons (actual refining was about 5,000 metric tons) that produced an average of 824,430 metric tons of refined sugar per year during an average 211 operating days per year.⁷

In this case, there are two options available when discussing the complementarity issue. Cane sugar refiners in the northeastern region of the United States rely on imported raw sugar for refining. Although Cuba has the capacity for expanding its refining industry, lack of capital is a current impediment. However, as stated by Polopolus and Alvarez (1991), U.S. refiners "are not linked closely with foreign raw sugar mills via ownership or joint ventures. The marketing relationship between refineries and these raw mills is, thus, contractual, usually with the assistance of brokers and/or sugar dealers" (p. 73). Cane sugar refining declined

drastically during the 1980s. Despite these limitations, it would appear that there are some opportunities for joint ventures in this area that would benefit Cuba's sugar industry, and would help the expansion of the U.S. refining industry after the contraction experienced during the last two decades. For example, one new refinery was recently completed and another one is currently under construction in Florida.

The second option would be for Cuba to participate in the "Sugar to be Re-Exported in Refined Form" program.⁸ Under this program, which was established by Presidential Proclamation No. 5002 of 30 November 1982, program participants import sugar exempt from quota and subsequently process the sugar for export either as refined sugar or in a sugar-containing product (Garrett, 1996, p. 23; Lord, 1995, p. 39). It is important to emphasize that the U.S. refiner is the entity which acquires the license and chooses the country with whom to participate. Countries qualify for this program through the Generalized System of Preferences (GSP) or the Caribbean Basin Initiative (CBI).

Although 29 countries participated in this program during the period 1988-95, annual participation during this period ranged from nine to 14 countries, with an average of 11 countries per year (Garret, 1996, p. 24). Colombia and Guatemala were the most active participants. Table 1 provides the actual amounts of quota-exempt sugar imported and exported during the 1990-96 calendar years under this program (ERS, June 1997, p. 43).

The world price of refined sugar usually has been between three and four cents higher than the world raw sugar price (Alvarez and Peña Castellanos, 1995, pp. 55-60, 91, 92; Lord, 1995, p. 29). This program would benefit both Cuba's raw sugar producers (although very slightly when one compares these benefits with the world price) and U.S. refiners.

Cuban Exports of Sugar for Polyhydric Alcohols

Another U.S. policy, contained in the same legislation as the sugar for re-export program just discussed, is the importation of sugar used in the United States for the production of polyhydric

alcohols, except those used as a substitute for sugar in human food consumption.

As described by Garrett (1996, p. 25), the program is not an important one. Only 10 U.S. industrial manufacturers of non-food products such as foam cushions, bowling balls, and car bumpers, use this imported sugar (at world prices) to produce the polyhydric alcohol used in manufacturing their products. Although these firms are not required to export their products, as in the previous case, they must comply with two main regulations for obtaining their license: to receive quota-exempt sugar and to comply with USDA regulations on the use of this sugar in their production process.

During the 1990-96 period, participation in this program only produced an importation rate of between 10 and 11,000 tons of raw sugar per year into the United States (ERS, June 1997, p. 43).

Cuban Exports of Oxygenated Fuels

There is another alternative that a post-sanctions Cuba could exercise without adversely affecting U.S. sugar producers. The Clean Air Act of 1990, enacted by the U.S. Congress and signed by President Bush on 15 November 1990, set strict clean fuel provisions that were expected to increase substantially the requirements for oxygenated fuels, including ethanol, methanol, and their derivatives.

Actual volumes, however, fell short of projections. Corn producers are still the main suppliers of this non-expanded market because of the major tax advantages they receive. Using sugar as a raw product is not economically feasible either. However, some sugar interests have entertained the idea of granting Cuba the tax advantages corn producers now receive for ethanol production under a post-sanctions scenario in an effort to avoid increased competition from Cuban sugar imports into the United States for food uses.

Summary and Conclusion

In conclusion, this paper has described the prospects of the sugar agro-industrial sectors in Cuba and Florida, and analyzed several sugar issues dealing with competition and complementarity between both

parties. In general, the paper has suggested ways that would minimize competition and also provide opportunities for cooperation.

The authors do not address the issue of when, and if, the U.S. economic sanctions on Cuba will be lifted. For almost four decades, conventional wisdom has anticipated strong opposition from U.S. producers to Cuban sugar imports when that moment comes. This study has shown that there are alternative options for addressing the problem. In addition, new avenues for mutual benefit also can be opened. Economic (and non-political) analyses suggest that the sugar industries of Florida and Cuba could become partners in several areas.

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Additional Notes:

3. This statement, which was written 20 years ago, was based purely on economic theory. Therefore, the authors want to reiterate that the current project of collaboration between the Center for Research on the International Economy at the University of Havana and the Department of Food and Resource Economics at the University of Florida does not take any position with respect to the debate on U.S.-Cuban economic relations.
4. As a matter of fact, Glaz reported a decrease of the successively planted cane practice in the 1996 census—41% were fallowed-planted, while 59% were successively planted. The decreasing trend of this practice, signaling some industry contraction, is corroborated by the 1995 figures—38.8% and 61.2%, respectively (1996, pp. 30-31).
5. For example, the discussion should also include the Cuban Government's counter-argument of the cost of the U.S. economic sanctions against Cuba during close to four decades. The Cuban leadership has stated that this issue should be included in the negotiations about the confiscated properties.
6. A major change has occurred since our previous publications. Until the enactment of the Helms-Burton Act, the trade sanctions rested on three statutory sources that provided the President of the United States with the legal authority to lift it without consulting Congress. The new legislation removes that power from the President.
7. Fernández Font (1995, p. 118) calls for an urgent process of modernization of Cuban refineries to make them more efficient since they now require high amounts of raw sugar and oil inputs. Increasing refined sugar production, according to him, would give Cuba access to new markets.
8. Those readers interested in the operational aspects of the program are referred to Garrett (1996).

Table 1. Quota-Exempt Sugar Imported and Exported, 1990-1996.*

	1990	1991	1992	1993	1994	1995	1996
Imports	562	542	693	611	600	217	635
Exports	625	650	536	436	480	518	331
* Numbers are expressed in 1,000 short tons, raw value							