THE CUBAN SUGAR INDUSTRY 1959–2019: FROM FRONT-RUNNER TO BACK OF THE PACK

Jorge F. Pérez-López[1]

At the end of the 1950s, the sugar industry held a leadership position within the Cuban economy and internationally. Domestically, the sugar industry was the largest contributor to the island's national product, the generator of the vast majority of export revenues, and the largest employer. Around this time, Cuba was the world's second largest producer of sugar and the largest exporter. Cuba was also an influential party in multinational diplomacy initiatives to stabilize notoriously volatile international sugar prices in the interest of orderly international development.

Sixty years later, the Cuban sugar industry is but a specter of what it once was. The sugar industry's contribution to the national product is tiny and over half of sugarcane lands and sugar mills have been abandoned. Small towns and communities in the countryside built around the *bateyes* of sugar mills have disappeared. Tourism has replaced sugar production as the engine of economic activity. Sugar production levels in recent years have been so low that they have been barely sufficient to meet domestic demand and some export commitments. In some instances, Cuba has been forced to import sugar in order to meet export obligations.

This paper compares the conditions and performance of the Cuban sugar industry around 1959 and 2019, that is, over the 60 years of Castroist rule on the island. To the extent possible, we will attempt to do this by relying on statistical information, although as is discussed in the appendix, the quantity and quality of statistics on the sugar industry have declined substantially over time and currently-available statistics are very limited.

THE CUBAN SUGAR INDUSTRY PRIOR TO 1959

By the middle of the XIX century, Cuba was already firmly established as a world-class sugar producer and exporter. In the 1860s, for example, the Cuban sugar industry turned out over one-quarter of world sugar output, and one-third of sugar produced from sugarcane.[2] In the first half of the XX century, the sugar industry grew by leaps and bounds, cementing the primacy of the industry in the national economy. Sugar production was deeply rooted in the psyche of Cubans: recall the saying, widely used by Cubans, "sin azúcar no hay país" that captured the popular perception of the sugar industry and its essential role in the nation.[3]

Sugar Industry Expansion

The Cuban sugar industry took off in the first quarter of the XX century. The conclusion of hostilities with Spain that had affected the countryside and in-

1. I am grateful to Roger Betancourt and Jorge Domínguez for very helpful comments on an earlier version of this paper.

2. Manuel Moreno Fraginals, *El Ingenio* (La Habana: Editorial de Ciencias Sociales, 1978), volume 3, p. 37.

3. This phrase is attributed to José Manuel Casanova, sugar magnate and politician, who presided over the Asociación Nacional de Hacendados de Cuba (National Association of Sugar Mill Owners of Cuba) in the 1930s and 1940s.

terrupted sugarcane production, coupled with revamped economic relations with the United States during the intervention and after the establishment in 1902 of the Cuban Republic, attracted investment—mostly foreign and to a smaller extent domestic—in sugarcane plantations and sugar mills. The Treaty of Commercial Reciprocity between Cuba and the United States, which entered into force in 1903, reduced by 20% the U.S. tariff on imports of Cuban sugar, giving Cuban sugar a price edge in the U.S. market that it maintained until the U.S. Government terminated commercial relations and sugar purchases from Cuba in 1962. Increased sales to the U.S. market, coupled with an overall increase in demand for Cuban sugar as a result of production interruptions in the Western European sugar been industry associated with World War I, boosted the Cuban industry: sugar production rose from around 1 million tons in 1903 to over 5 million in 1925.[4] (Table 1)

In the decade prior to the establishment of the Republic and after the entry into force of the Treaty of Commercial Reciprocity with the United States, foreign investment expanded briskly in Cuba. Before the establishment of the Republic, foreign investments had primarily been British and centered on railroads, maritime shipping and real estate. During the U.S. intervention (1898–1902) and after the establishment of the Republic, the U.S. became the major investor, with U.S. investment expanding rapidly, focusing on agriculture, principally sugar and tobacco, and mining. According to the U.S. Tariff Commission, the bulk of U.S. investments in Cuba in the first decade of the XX century were directed at clearing and preparing virgin lands for sugarcane cultivation in the Eastern half of the island and at the construction of new sugar mills.[5]

From 1902 to 1927, 59 sugar mills were built in Cuba, 44 of them (75%) in the Eastern-most provinces of Camagüey and Oriente,[6] capitalizing on the abundant virgin lands available for sugarcane cultivation in these regions (Figure 1). Between 1914 and 1918, there was a spike in the construction of sugar mills, with 25 new mills built throughout the nation, the bulk of them in the Eastern-most provinces. Significant investments were also made in the construction and improvement of railroads to transport sugarcane from fields to mills and sugar from mills to export ports, most of them located in the northern coast of the island facing U.S. ports of importation.[7]

By the first decade of the XX century, Cuba had established its position as the primary supplier of sugar to the United States. In 1903, the U.S. purchased over 1 million tons of Cuban sugar, 38% of its overall imports, growing to 2 million tons per annum starting in 1913, when Cuban shipments accounted for 40% and in some instances over 50% of U.S. sugar imports. (Table 1) During World War I, with sugar deemed a strategic commodity in short supply in Western Europe, the Allies created an International Sugar Committee to regulate sugar deliveries to the United States and Western Europe. Cuba sold its entire 1918 and 1919 sugar crops to the Committee at favorable prices.[8] Over the war years (1914–19), Cuba supplied nearly 50% of the imported sugar needs of the United States.

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4. See Jorge Pérez-López, "Relaciones comerciales azucareras Cuba-Estados Unidos, 1902–1960," in Antonio Santamaría and José Manuel Azcona, editors, *90 millas: Relaciones económicas Cuba-Estados Unidos, siglos XX, XXI*, forthcoming 2020.

5. U.S. Tariff Commission, *The Effects of the Cuban Reciprocity Treaty of 1902* (Washington: U.S. Government Printing Office, 1929), p. 170. On the adverse impact of the territorial expansion of the sugar industry on the Cuban environment see Reinaldo Funes, *De bosque a sabana: Azúcar, deforestación y medio ambiente en Cuba* (México: Siglo XXI Editores, 2004). A complementary history of the expansion of the sugar industry through the lens of the business activities of businessman Manuel Rionda, is Muriel McAvoy, *Sugar Baron: Manuel Rionda and the Fortunes of Pre-Castro Cuba* (Gainesville: University Press of Florida, 2003).

6. Grupo Cubano de Investigaciones Económicas, *Un Estudio Sobre Cuba* (Miami: University of Miami Press, 1963), p. 446.

7. Basic to understand the role of railroads in the expansion of the sugar industry is Oscar Zanetti and Alejandro García, *Sugar and Railroads: A Cuban History 1837–1959* (Chapel Hill: University of North Carolina Press, 1987).

8. Roy A. Ballinger, *A History of Sugar Marketing Through 1974* (Washington: U.S. Department of Agriculture, 1971), pp. 21–22. The Committee was also responsible for purchases of sugar from the Dominican Republic, Puerto Rico and the Virgin Islands.

Table 1. Cuban sugar production, U.S. imports of Cuban sugar, and share of Cuban sugar in the U.S. market, 1902–1960

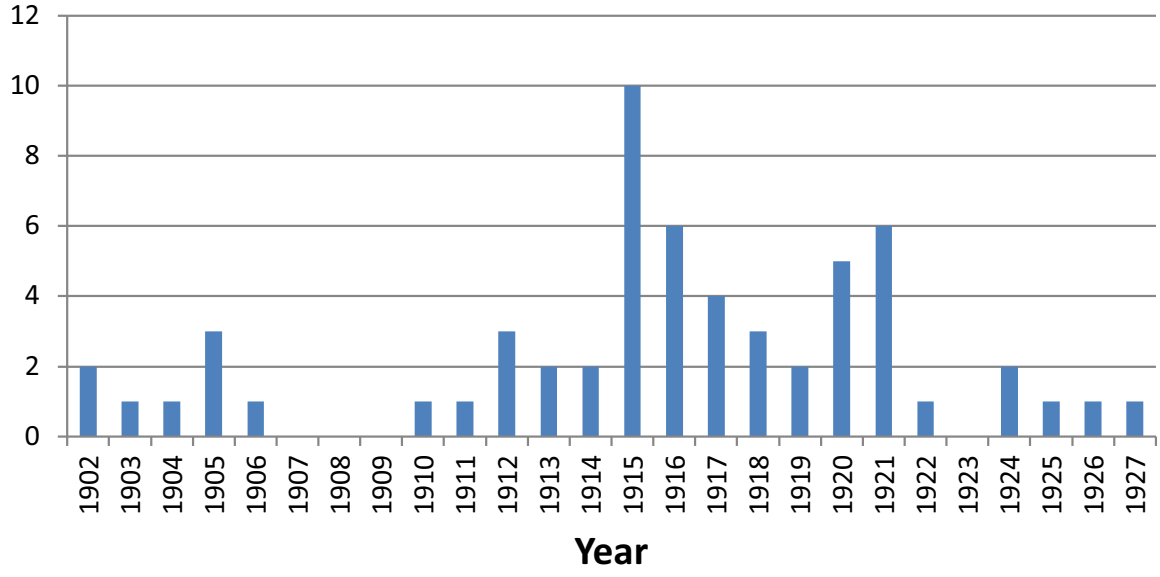
	Sugar Production (thousand tons)	U.S. Imports of Cuban Sugar (thousand tons)	Cuban Sugar Market Share of Total U.S. Imports (%)	Sugar Production (thousand tons)	U.S. Imports of Cuban Sugar (thousand tons)	Cuban Sugar Market Share of Total U.S. Imports (%)	Sugar Production (thousand tons)
1902	850	446	19.1	1932	2604	1625	28.2
1903	1000	1087	38.1	1933	1994	1427	25.4
1904	1045	1279	46.6	1934	2256	1693	24.6
1905	1173	934	33.0	1935	2538	1660	30.7
1906	1230	1262	40.7	1936	2557	1907	29.8
1907	1430	1468	44.8	1937	2975	1955	31.4
1908	970	1048	28.8	1938	2976	1761	29.3
1909	1536	1298	43.8	1939	2724	1751	25.9
1910	1843	1592	49.0	1940	2779	1588	27.1
1911	1464	1519	42.1	1941	2407	2449	33.7
1912	1913	1445	47.5	1942	3345	1629	32.3
1913	2442	1956	53.2	1943	2842	2592	44.2
1914	2615	2234	53.7	1944	4171	3282	52.1
1915	2609	2170	48.5	1945	3453	2543	46.7
1916	3033	2336	45.6	1946	3940	2070	40.3
1917	3063	2118	40.9	1947	5677	3577	50.8
1918	3473	2068	53.8	1948	5876	2655	41.3
1919	4011	3033	50.8	1949	5074	2815	41.0
1920	3742	2614	52.1	1950	5395	2961	39.6
1921	3983	2350	45.4	1951	5590	2673	38.0
1922	4035	4107	56.7	1952	7011	2703	37.4
1923	3645	3108	55.4	1953	5077	2504	33.4
1924	4112	3349	58.2	1954	4753	2410	33.1
1925	5189	3559	52.8	1955	4404	2754	34.0
1926	4932	3883	58.0	1956	4605	2813	34.4
1927	4509	3311	55.0	1957	5506	2754	35.1
1928	4042	2948	47.0	1958	5614	3241	37.9
1929	5156	3764	51.9	1959	5964	2937	34.8
1930	4671	2400	43.9	1960	5862	1949	25.1
1931	3121	2252	37.2				

Source: Production: Grupo Cubano de Investigaciones Económicas, *Un estudio sobre Cuba*. Miami: University of Miami Press, 1963, pp. 443, 651, 942, based *Anuario Azucarero de Cuba*, various volumes. U.S. Imports: 1902–1953, U.S. Congress, House Committee on Agriculture, *History and Operations of the U.S. Sugar Program* (Washington: U.S. Government Printing Office, 1962), p. 3; 1954–1960, International Sugar Organisation, *Sugar Year Book*, various volumes; Market share: 1906–1958, *Anuario Azucarero de Cuba 1958*; 1902–1905 and 1960, U.S. Congress, House Committee on Agriculture, *loc cit*.

With the end of the War and the expiry of the stabilization agreements, international sugar markets were rocked by added supply from European production, speculation, and false market signals. World market prices reacted sharply: they reached 6.65 cents/pound in 1919, a relatively high price, but shut up in 1920, reaching 9 cents/pound in mid-February, 10 cents/pound in early March, 12 cents/pound at the end of March, 18 cents/pound in April, 19 cents/pound on May 12, and 22.5 cents/pound on May 19. The economic bonanza for the Cuban sugar industry and for the economy at large generated by the very high sugar international market prices was known as *La Danza de los Millones* (Dance of the Millions) or *vacas gordas* (fat cows), to differentiate from lean times called *vacas flacas* (skinny cows).

It was a short-lived dance, however. Once the European sugar beet industry recovered and other countries also increased supply, the world market returned to the historical patterns of excess supply and low prices. But the damage inflicted on the Cuban industry by the price fluctuations was significant and long-lasting. Enticed by the high prices, Cuban entrepreneurs had borrowed aggressively to expand their sugarcane farms and mills and to finance conspicuous

Figure 1. New Sugar Mills Built in Cuba, 1902–1927



Source: Grupo Cubano de Investigaciones Económicas, *Un Estudio Sobre Cuba*. Miami: University of Miami Press, 1963, p. 446.

consumption. When sugar prices collapsed, the bottom fell out of the financially overextended Cuban business class. Borrowers were unable to meet repayment obligations, forcing them into bankruptcy, bringing down national banks without sufficient assets, who were taken over by foreign banks. One of the results of the financial crash of 1920 was a significant shift in the nationality of ownership of the Cuban sugar industry: while in 1913 U.S. and Canadian interests controlled 28% of sugar mills (48 of 171 sugar mills), by 1925, U.S. and Canadian control of sugar mills had nearly doubled to 54% (98 of 182 sugar mills). As mills owned by U.S. and Canadian interests tended to have larger production capacity than the average sugar mill, the share of sugar produced attributable to U.S. and Canadian mills in 1913 was 34%, rising to 66% in 1925. (Table 2)

Table 2. Nationality of Owners of Sugar Mills and Sugar Production (percentages)

Year	Nationality of Owner		Sugar Production by Nationality of Owners	
	U.S./Canada	Cuba and others	U.S./Canada	Cuba and others
1913	28	72	34	66
1919	45	55	55	45
1925	54	46	66	34

Fuente: Antonio Santamaría García, *Sin azúcar no hay país: La industria azucarera y la economía cubana (1919–1939)*. (Sevilla: Universidad de Sevilla, Escuela de Estudios Hispano-Americanos, 2001), p. 143

Sugar Industry After the Financial Crash

In the 1920s, world sugar stocks were very high. Not only had Cuban output increased substantially, but so had production levels in Puerto Rico, the Philippines and Java; moreover, the European sugar beet industry had recovered. The result was a glut of sugar in the world market and depressed prices. Despite these market conditions, businessmen continued to invest in Cuban sugar plantations and mills: 18 new mills were built in the island between 1919 and 1926, among them two very large mills (called *colosos* in Cuba), Jaronú and Vertientes. In the 1920s, Cuba continued to dominate the U.S. import market, with its share of U.S. imports rising to nearly 60% in 1924 and 1926, when it shipped to the U.S. 3.3 million tons and 3.8 million tons, respectively.

As the premier world sugar exporter, Cuba assumed a leadership position in efforts to stabilize world sugar prices. In 1926 the Cuban government passed the Verdeja Act, a domestic measure that reduced Cuban production for that year—at the level of each sugar mill—by 10% of recent production and authorized

the executive to limit sugar production in subsequent years. Thus began a period, which would last until World War II, of Cuban self-restraints on sugar production in the interest of stabilizing international sugar prices. Needless to say, unilateral actions by a single supplier with the intention of limiting a commodity's world output, particularly one with elastic supply, are bound to prove futile and so was the case for the Verdeja Act restrictions. Cuba made several other efforts to stabilize sugar prices that involved self-restraint, for example by reaching an arrangement in 1927 with sugar interests from Czechoslovakia, Poland and Germany to coordinate policies to limit sugar production and exports and backing efforts to stabilize world sugar prices—by reducing production and establishing export quotas—by selected countries embodied in the Chadbourne Agreement. However, as the arrangements did not cover all countries, they failed in their price stabilization objective. Cuba was also a moving force behind the 1937 International Sugar Agreement (ISA), the first multilateral commodity agreement dealing with sugar.

The U.S. Sugar Act of 1934, also known as the Jones-Costigan Act, profoundly changed the mechanism for limiting sugar imports into the U.S. market, setting aside the tariff system in place since 1894, and instead setting up quantitative limits (quotas) allocated to domestic and foreign producers. Cuba was initially allocated a fixed quota of 28.6% of U.S. demand; in 1948 the quota system was modified to Cuba's benefit, as the island was also allocated the bulk of shortfalls in domestic production or shipments from the Philippines. Cuba's sugar exports to the United States during 1955–59 averaged nearly 2.9 million tons per annum.

The outbreak of World War II paralyzed European sugar beet production, allowing the Cuban sugar industry to regain some ground and produce at levels similar to those of the 1920s. Sugar production grew from 2.5 million tons in 1941 to 3.5 million tons in 1942, 4.4 million tons in 1944, 5.9 million tons in 1947, and 6.1 million tons in 1948. During this period, the sugar industry experienced a process of "Cubanization," with Cuban entrepreneurs and national financial institutions acquiring sugar lands and sugar mills meaning that had been held by foreigners. In 1939 Cuban nationals owned 56 sugar mills (of 174 in operation), producing 22.4% of sugar output; in 1958 they owned 121 mills (out of 161 in operation), producing 62.1% of total sugar output.

In the 1950s, sugar production fluctuated significantly, from an all time-high (up to that time) of over 7 million tons in 1952 (when no production controls were in effect) to 4.8 million tons in 1954. Over the decade of the 1950s, production averaged 5 million tons per annum, the best sustained performance of the industry since the decade of the 1920s. In 1949–58, the sugar sector generated on average 28–29% of Cuba's national product; in 1957–58, sugar's contribution was still about 25% of national product despite efforts during the 1950s to encourage expansion of the non-sugar industrial sector and diversification of agricultural production.

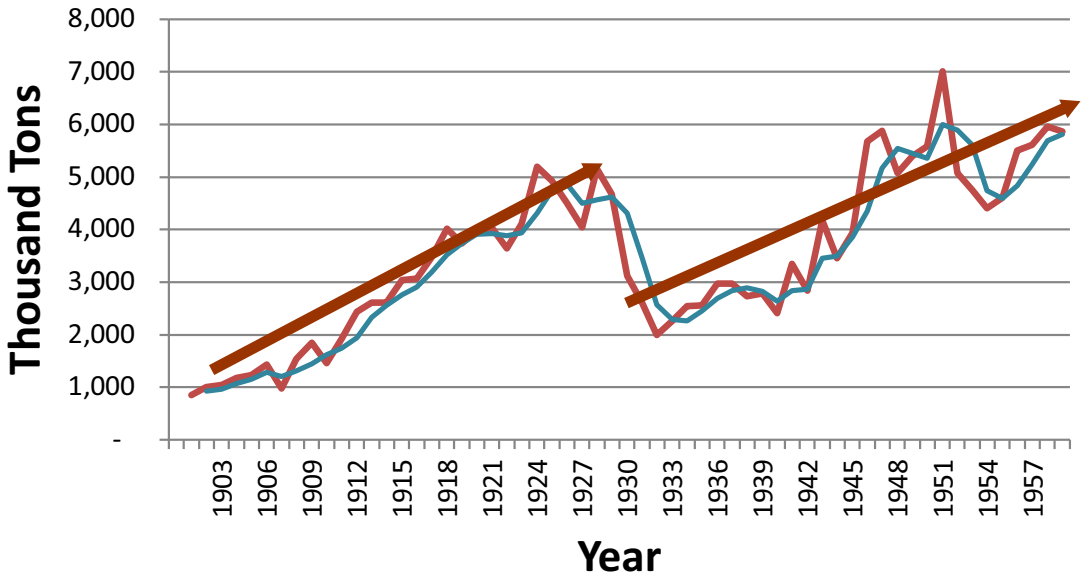
Figure 2 shows Cuban annual sugar production during the period 1902–1959 plotted annually (red trace) and as a three-year moving average to smooth out year-to-year fluctuations (blue trace). The performance of the industry over the entire period neatly breaks up into two segments, a period of ascending production lasting through 1927, a sharp drop in production through 1933, and a subsequent period of ascending production through 1959. The two solid lines superimposed on the plot provide a rough indicator of the trend of sugar production in the two sub-periods.

THE CUBAN SUGAR INDUSTRY SINCE 1959[9]

In 1959, the Cuban sugar industry consisted of 161 mills, 21 refineries, 48 alcohol distilleries and several plants producing a range of bagasse-derived products, including newsprint, hardboards, particle boards, acoustical tiles, bagasse pulp fine papers, and office furniture located throughout the island, principally in the central and eastern regions of the coun-

9. This section draws from Jorge F. Pérez-López, *The Economics of Cuban Sugar* (Pittsburgh: University of Pittsburgh Press, 1991).

Figure 2. Cuban Sugar Production, 1902–1959



Source: Based on sugar production data from Table 1.

try. In the 1950s it is estimated that the sugar industry controlled over one third of the island's capital stock.

Through the first three quarters of 1959, the Cuban revolutionary government—in power since January 1, 1959—sold some 500,000 tons of sugar to the Soviet Union. It should be noted that these commercial contacts were not in themselves extraordinary, as the Soviet Union and other socialist countries had frequently purchased sugar from Republican Cuba,[10] at world market prices, complementing the much larger volumes of sugar exports to the U.S. under preferential arrangements. By the time the first trade and payments agreement between Cuba and the Soviet Union was signed on February 13, 1960, the Soviet Union had already contracted to buy 575,000 tons of Cuban sugar for delivery in 1960. The February agreement obligated the Soviet Union to purchase an additional 425,000 tons for delivery in 1960, bringing total Soviet purchases for 1960 to 1 million tons, and setting this level of purchases for each of the years 1961–64. The Soviet Union also agreed not to re-export sugar to Cuba's traditional markets. As Cuban sugar exports during 1954–59 had averaged about 5 million tons per annum, the 1 million tons to be sold to the Soviet Union represented about 20% of exports, a significant market share.

Another provision of the 1960 Cuba-Soviet Union trade agreement set forth that a second tranche of sugar purchases in 1960 (425,000 tons) would be paid in the form of Soviet goods; for the period 1961–64, 20% of the value of Soviet imports of Cuban sugar would be paid in convertible currency and the remaining 80% in Soviet goods.[11] Critics of the

10. According to official Cuban trade statistics, during 1949–58, Cuba exported sugar to the Soviet Union, Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia, and the People's Republic of China. Cuba sold sugar to the Soviet Union every year during 1953–58, including substantial volumes in 1955 (456,000 tons, or about 10% of exports) and 1957 (380,000 tons or 7% of exports).

11. "Convenio de intercambio comercial y de pagos entre la República de Cuba y la Unión de Repúblicas Socialistas Soviéticas," *Gaceta Oficial* (8 de marzo de 1960), pp. 5737–39.

agreement noted that the barter trade provisions represented a significant departure in Cuban trade relations, as theretofore Cuban-Soviet trade had been one-sided, with Cuba running a large trade surplus with that country. In fact, Cuban official statistics do not record *any* imports from the Soviet Union over the period 1953–58.[12]

Further, although the 1960 agreement was silent on this critical point, it is reasonable to assume that Cuban sugar exports to the Soviet Union would be made at or near prevailing world market prices, consistent with practice in sugar trade between the two countries. In February 1960, when the Cuba-Soviet agreement was signed, the sugar world market price hovered around 3 cents/pound, while the preferential price paid by the U.S. for Cuban sugar in 1960 was about 5.35 cents/pound, 78% higher than the world market price. In fact, there is empirical evidence that Cuban sugar sales to the Soviet Union in 1960 were made at prices that were actually *lower* than world market prices. As sugar expert and later Foreign Trade Minister Raúl Cepero Bonilla stated, "Cuba does not wish high prices [in sales of sugar to the Soviet Union] because they encourage sugar production in other areas, and, believes that price policies play a secondary role in plans to expand sugar exports. International economic policies [i.e., an international sugar agreement], rather than price policies of the Cuban government, will determine whether Cuba will be able to expand its sugar exports."[13]

A major point of contention between Cuba's revolutionary government and the United States was the nationalization by the Cuban government of property owned by U.S. persons without prompt, adequate and effective compensation. The Agrarian Reform Law of May 1959 affected several large U.S. land holders, including sugarcane growers, and launched diplomatic disputes over compensation for former owners. Another very important set of disputes centered on the Cuban government's "intervention" of the refineries operated by the international oil companies in June 1960 for their refusal to process Soviet crude oil that the Cuban state had received in barter for Cuban sugar pursuant to the February 1960 trade and payments agreement.

In July 1960, as part of the Sugar Act, the United States authorized the President to cut any foreign quota if such action was in the national economic interest. Shortly after the Act was passed, the U.S. Administration used it to cut back Cuba's sugar quota for 1960 by 700,000 tons on the grounds that Cuba's sugar sales to the Soviet Union and other socialist countries put into question Cuba's ability to continue to be a reliable supplier of sugar to the U.S. market. The Soviet Union and its socialist bloc allies acted swiftly to purchase the sugar rebuffed by the U.S. Thus, the PRC agreed to buy 2.5 million tons of Cuban sugar over a five-year period, and agreements were negotiated with Poland, East Germany, Bulgaria, Hungary, Czechoslovakia and Romania to acquire additional amounts of Cuban sugar. Subsequently, the U.S. set Cuba's sugar quota for 1961 at zero. From this point forward, then, the Soviet Union and the socialist community countries became the main markets for Cuban sugar, a radical shift in export patterns played out over a very short time period. In 1960, the Soviet Union and the socialist community countries took 2.9 million tons of Cuban sugar, 40% of exports in that year, and in 1961 about 4.8 million tons, 75% of exports, compared to the average 280,000 tons per annum, 5.5% of exports, they took in 1954–59.

Data on prices of Cuban sugar exports to the Soviet Union and the socialist countries are not available. However, based on unit values calculated from trade data from Cuba and other sources, it can be inferred that the price was about 3 cents/pound in 1960, rising to 4 cents/pound in 1961–62, closely following world market price trends.[14] However, as sugar world market prices strengthened in 1963, soaring to as high as 10.36 cents/pound in December and averag-

12. Cuban Economic Research Project, *A Study on Cuba* (Coral Gables: University of Miami Press, 1965), p. 701.

13. Raúl Cepero Bonilla, *El convenio cubano-soviético* (La Habana: Editorial Echevarría, 1960), p. 9.

14. Pérez-López, *The Economics of Cuban Sugar*, p. 139.

ing 8.50 cents/pound for the year, the Soviet Union increased the sugar purchase price to about 6 cents/pound, a price that would remain in place through the rest of the decade. This practice of specifying quantities and prices of sugar exports to the Soviet Union and the socialist bloc countries through country-to-country protocols not reflective of market conditions eventually led to the bloating of the industry and its demise at the beginning of the XXI century.

By the end of 1960, essentially all of the country's medium-size and large economic enterprises were under state control. In addition to the mentioned Agrarian Reform Law, Law 851, issued on July 6, 1960, authorized the nationalization of properties of U.S. nationals, including sugarcane estates and sugar mills, while Law 890 of October 15, 1960, authorized the nationalization of remaining foreign corporations and their subsidiaries operating in the island as well as large corporations owned by Cuban nationals. Thus, by early 1961, Cuban government controlled essentially the totality of the nation's industrial and mining sectors, grouped under the newly-created Ministry of Industries.

Role of Sugar in Development Policy

With the removal of owners and managers and the departure of key technicians from mills and sugarcane estates, the sugar industry floundered, failing to meet production and export commitments to the Soviet Union and the socialist countries. Adding to the woes of the industry were the Cuban government's economic policies implemented in 1961 turning away from sugar and toward import substitution industrialization.[15]

As the unrealistic and under-resourced import substitution industrialization policy failed, Cuba's development strategy shifted in 1964 to a sugar-led, export promotion approach. Cuba adopted a sugar plan for 1965–70—called the Prospective Sugar Plan—that foresaw annual increases in sugar output culminating in a gigantic sugar crop of 10 million tons in 1970;[16] to put in context the magnitude of this goal, historically Cuba's largest sugar crop had been just over 7 million tons in 1952 and production had averaged 4.5 million tons in 1961–65. Despite the reallocation of resources from other sectors of the economy, the extensive use of voluntary labor and personnel from the armed forces in harvesting, and the extension of the milling season until July 1970, production in that year reached 8.5 million tons, a record level of production, but short by 15% of the 10 million ton target. (Figure 3)

In the aftermath of the 1970 sugar campaign and the severe economic dislocations that it engendered, government policies toward the sugar industry shifted from giant, barn-busting sugar crops to stable and more efficient sugar production, with gradual increases in output. Efforts were made to increase industrial yields, reduce fuel consumption by sugar mills, broaden the scope of mechanization in cutting and loading of sugarcane, and improve on the timeliness of exports.

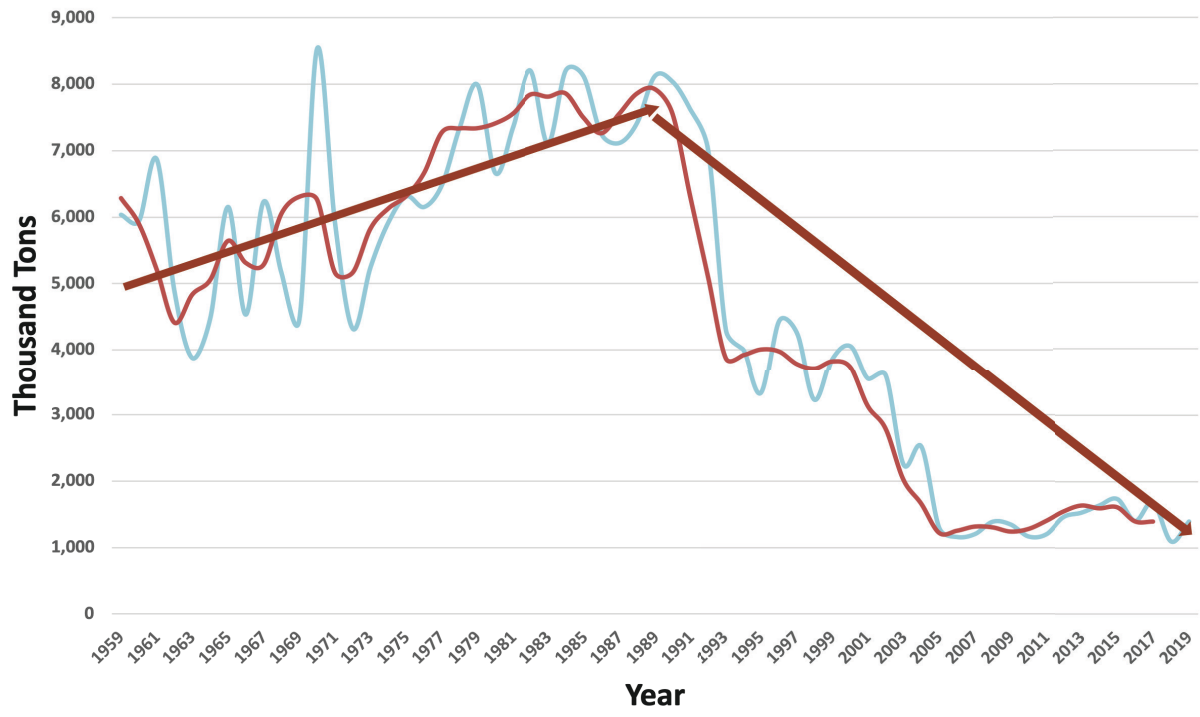
Cuban Sugar and Socialist Country Markets

The rationalization of the sugar industry was influenced by Cuba's formal accession in 1972 into the Council for Mutual Economic Assistance (CMEA or COMECON), the economic community of the Soviet Union and socialist nations. Within the CMEA, Cuba was assigned the role of sugar supplier, a decision that deepened Cuba's specialization on production of raw sugar.

15. These policies were promoted by the Ministry of Industries, led at the time by Ernesto "Che" Guevara. The absurdity of the economic results expected by the Cuban government is captured in Guevara's address to the Inter-American Economic and Social Council meeting in Punta del Este, Uruguay, on August 8, 1961, where he predicted that by 1965, Cuba would (a) be first in Latin America with respect to per capita production of steel, cement, electricity, and, oil refining, with the exception of Venezuela, tractors, rayon, footwear and textiles; (2) be second in the world with respect to production of metallic nickel (until that time Cuba had only produced nickel concentrates); (3) produce 8.5 to 9 million tons of sugar; and (4) initiate the transformation of the sugar industry into a sucrochemical industry. The speech was recently reproduced by the Cuban press. See "El histórico discurso del Che en Punta del Este," *Cubadebate* (August 9, 2017). http://www.cubadebate.cu/noticias/2017/08/09/el-historico-discurso-del-che-en-punta-del-este-video/.

16. A good description and analysis of the Prospective Sugar Plan is given in Heinrich Brunner, *Cuban Sugar Policy from 1963 to 1970* (Pittsburgh: University of Pittsburgh Press, 1977), Chapter 2.

Figure 3. Cuban Sugar Production, 1959–2019



Source: See text, particularly the statistical annex.

The appetite of the socialist countries for Cuban sugar was insatiable, and for once Cuba could count on ready buyers for its sweet. Moreover, the foreign trade practices of the Soviet Union and the CMEA countries of trading among themselves at fixed prices that were politically negotiated and contractually agreed for a multiple-year period (typically five years) meant that Cuba was able to negotiate highly favorable prices for its sugar exports, insulated from volatile world market prices. In the mid-1970s, when there was a boom in commodity prices led by oil, Cuba locked in very favorable prices for sugar with the CMEA countries and subsequently negotiated very favorable escalation clauses that meant that prices received by Cuba from exports to socialist countries far exceeded world market prices and resulted in a sizable subsidy to the Cuban economy.[17]

During the five-year plan 1976–80, Cuba implemented a massive plan to modernize and expand sugar industrial capacity. More than 40 mills were overhauled and two new mills were brought on-line, the first new mills built in the country in over 50 years. Output rose steadily through 1979, when 7.8 million tons of sugar were produced, the second highest annual sugar production on record, but fell sharply in 1980 when the sugarcane crop was hit hard by an epidemic of *roya* (cane rust) that affected yields. Output in 1980 was about 6.8 million tons, a respectable volume but well short of the goal of 8–8.5 million tons.

In July 1981, Cuba and its three primary sugar importers within CMEA—the Soviet Union, Bulgaria, and the German Democratic Republic—signed a General Agreement on the Integral Development of Sugar Production (also known as the CMEA Sugar

17. See, e.g., Pérez-López, "Cuban-Soviet Sugar Trade: Price and Subsidy Issues," *Bulletin of Latin American Research*, Vol. 7, No. 1 (1988).

Program) that formalized Cuba's role as the primary supplier of sugar to the socialist community. Henceforth Cuba would receive preferential price treatment for sugar exports to CMEA and assistance—subsidized credits, technical aid—for the development of its sugar industry. The plan foresaw Cuba increasing its sugar production to 11–12 million tons per annum by 1990 and 13–14 million tons per annum by 2000. Counting on the socialist countries to absorb this very high level of output, Cuba anticipated the construction of up to 15 new sugar mills, although (fortunately, given the retrenchment of the industry two decades later) only 8 were built.

In 1981–85, Cuba planned to start construction of 7 new sugar mills, expand 23 and renovate 18 others; sugar output was expected to average about 25% above the average of 7.1 million tons per annum achieved during 1976–80. Although these production targets were not met, for the following five-year period (1986–90), Cuba planned large investments in sugarcane fields and industrial plant, including completion of some of the mills under construction, to support a further increase of 15% in sugar production, with annual production levels exceeding 8 million tons per annum. Around this time Cuba also began to experiment with a new form of economic organization, the agroindustrial complex, which brought together sugar agricultural and industrial activities under a unified management structure thus seeking to eliminate bottlenecks in the delivery of sugarcane to mills. In the next few years, most sugar mills and surrounding sugarcane lands were turned into agroindustrial complexes. This move recognized that increasing sugar production required higher efficiency and improvements in sugarcane agriculture. In the second half of the 1980s, Cuba's sugar production averaged 7.48 million tons per annum, slightly higher than the 7.35 million tons per annum produced in the first half of the 1980s.

The 1980s represented a golden period for the Cuban sugar industry, boosted by unlimited demand from the socialist countries and very favorable prices—several-fold the world market price—for its exports to the Soviet Union. As data in Table 3 show, during this decade the Soviet Union and the CMEA countries were the primary markets for Cuban sugar, taking 67–85% of Cuban sugar exports, with Cuba's share of exports to countries outside of the CMEA (identified as world market in the table) dropping to as low as 15% in 1987. Within the CMEA, the Soviet Union was the major purchaser of Cuban sugar, responsible for over 50% of Cuba's sugar exports in the 1980s, and over 60% in 1986–87 and the first half of 1990.

Table 3. Destination of Cuban Sugar Sales, 1981–1990

Year	% of sales to CMEA Countries		% of sales
	All	USSR	to world market
1981	67	45	33
1982	80	57	20
1983	75	49	25
1984	79	52	21
1985	76	52	24
1986	78	60	22
1987	85	60	15
1988	83	47	17
1989	79	49	21
1990 (6 months)	80	60	20

Note: Based on physical quantities statistics of the International Sugar Organisation.

Source: Jorge Pérez-López, "Swimming Against the Tide: Implications for Cuba of Soviet and Eastern European Reforms in Foreign Trade," *Journal of Inter-American Studies and World Affairs*, 33:2 (Summer 1991), p. 95.

Alvarez and Peña Castellanos argue that the successes of Cuban sugarcane agriculture in the 1980s underlying the sugar production gains were associated with what they call the "state extensive growth model," characterized by extensive areas under production, high levels of capital investment, and high use of inputs such as chemical fertilizers and herbicides, machinery and irrigation, that increased production costs substantially.[18] As Pollitt concludes: "The relatively import-intensive nature of Cuban sugar production and the comparatively high unit costs of production were of no great concern so long as the island's main sugar markets—most notably the USSR—paid premium sugar prices and supplied the

18. José Alvarez and Lázaro Peña Castellanos, *Cuba's Sugar Industry* (Gainesville: University Press of Florida, 2001), Chapter 2.

bulk of needed inputs. But in 1991, the USSR imploded, to split into the 15-member Commonwealth of Independent States (CIS), and COMECON came to an end. The consequences for the Cuban economy as a whole and for the sugar sector in particular were catastrophic."[19]

The Collapse of the Sugar Industry—the Special Period

Like the Dance of the Millions seven decades earlier, the golden era of the 1980s came crashing down in the 1990s. Early in the 1990s, Cuba suffered perhaps its worst economic crisis since the Great Depression. While a combination of external and internal factors were responsible for the economic collapse, the most significant was the dissolution of the Soviet Union and the end of the socialist community, which meant the disappearance of the CMEA and with it the extensive commercial and financial arrangements Cuba had with the CMEA countries. Between 1989 and 1993, the island's foreign trade contracted by 75%. Virtually overnight, the Soviet Union ceased buying Cuban sugar at inflated (subsidized) prices, reduced imports of nickel, citrus, cigars, and other products, stopped supplying Cuba with consumer, intermediate and capital goods, and cut back on oil shipments to the island. In a matter of a few years, the Cuban-Soviet commercial relationship was relegated essentially to barter of a limited amount of Cuban sugar for Soviet (Russian) oil based on world market prices. The economic crisis evolved over several years, reaching bottom in 1993: it is estimated that compared to 1989, GDP in that year was lower by 35%, per capita GDP by 41%, and physical production of sugar by 48%, nickel by 36%, citrus fruits by 32% and fish and shellfish by 63%. The economic shock was so intense that it was akin to what might be expected during a period of war, hence its moniker "Special Period in Time of Peace" or "Special Period."

Sugar production remained relatively high in the early 1990s, reaching 8.04 million tons in 1990, 7.61 million tons in 1991 and 7.01 million tons in 1992. The disruption in commercial relations with the Soviet Union affected directly the latter's demand for Cuban sugar, but also Cuba's ability to import critical inputs for the sugar industry (such as fertilizer, spare parts and fuel for harvesting equipment, and replacement parts for transportation and milling equipment) that were formerly provided by the Soviet Union. Sugar output plunged in 1993 to 4.30 million tons, just over half of output in 1989, a production level that although it seemed surreally low at the time, has only been surpassed once since then (4.45 million tons in 1996). (Figure 3)

In 1997, the Sugar Ministry (MINAZ) developed a short-term plan (through 2002) and a long-term plan (through 2010) intended to revive the industry. The plans foresaw measures to increase sugarcane yield per hectare and raise the efficiency of sugar mills. It also recognized the overcapacity of the industry, selecting about 100 agroindustrial complexes (of 156) that had demonstrated good performance in both sugarcane production and efficiency in sugar production to continue to be sugar producers, with the rest to be turned into producers of specialty sugar products, sugar by-products and electricity. The plan foresaw sugar production in 2002 at about 5.5 million tons, but actual production in that year was 3.6 million tons, 35% off the target.

The Demise of the Sugar Industry

Superseding the plans developed in 1997, in August 2002, shortly after the conclusion of the 2001–2002 *zafra*, the Minister of the Sugar Industry announced a new, and more radical, sugar agroindustry restructuring plan. The objective of the new plan, according to the official, was to retain an industry capable of producing 4 million tons of sugar per annum (the earlier plan set out in 1997 foresaw a production capability of 6 million tons) with a high degree of efficiency, low costs, and high profitability. The key elements of the restructuring plan were:

- Out of the existing 156 sugar mills, 71 would continue to produce raw sugar; 14 would continue to operate, but would produce sugar and mo-

19. Brian H. Pollitt, "The Rise and Fall of the Cuban Sugar Economy," *Journal of Latin American Studies,* Vol. 36, No. 2 (May, 2004), p. 328.

lasses intended for animal feed, and the remaining 71 would be deactivated. The 71 mills slated to continue to be sugar producers had combined daily grinding capacity of 342,900 tons per day or 53% of overall grinding capacity at the time, the 14 mills slated to be molasses producers had daily grinding capacity of 58,800 tons per day or 9.1% of overall daily capacity, and the 71 mills destined for deactivation had a combined daily grinding capacity of 245,000 tons per day or 37.9% of overall daily capacity. (Table 4)

- The disposition of the 71 mills slated to be deactivated was: 5 would be converted into museums for tourists, 5 would remain in stand-by (reserve status) to meet future needs, and 61 would be dismantled.
- Sugarcane production would occupy 700,000 hectares of the most productive and best-suited soils; the goal would be to achieve yields of 54 tons of sugarcane per hectare and have harvests lasting only 90–100 days. An additional 127,000 hectares of land would be devoted to molasses production.
- Annual sugar production would be set at a level that would (a) satisfy domestic consumption of about 700,000 tons; (b) fulfill export commitments; and (c) allow some sales to the world market whenever the world market price made it profitable to do so.

Generally speaking, the mills destined for deactivation were small in terms of daily grinding capacity, presumably because larger mills were more efficient. Thus, out of the 71 mills taken out of commission, 48 had grinding capacity of under 3,000 tons per day, and only 5 had grinding capacity of over 6,000 tons per day.[20]

Table 4. Disposition of Sugar Mills per the 2002 Sugar Industry Restructuring Plan

	Number (and %)	Grinding Capacity in Tons of Sugarcane per Day (and %)
All mills prior to restructuring	156 (100%)	647,200 (100%)
Continue as sugar producers	71 (45.5%)	342,900 (53.0%)
Continue as molasses producers	14 (9.0%)	58,800 (9.1%)
Deactivated*	71 (45.5%)	245,550 (37.9%)

Note: 5 to be turned into museums, 5 held in stand-by and 61 to be dismantled.

Source: José Alvarez and Jorge Pérez-López, "The Restructuring of Cuba's Sugar Agroindustry, 2002–2004," in Pérez-López and Alvarez, editors, *Reinventing the Cuban Sugar Agroindustry* (Lanham, Maryland: Lexington Books, 2005), p. 152.

The first two sugar crops after the restructuring plan was launched were quite disappointing, with sugar production reaching about 2.3 million tons in 2003 and 2.5 million tons in 2004, with Cuban officials anticipating that the bottom of production had been reached. In reality, sugar production has not come close to achieving the 2-million ton mark—one half of the anticipated 4 million tons foreseen by the restructuring plan—since then. Commenting on the disappointing results for 2005, when production was 1.3 million tons and 56 sugar mills were in operation, Fidel Castro declared the demise of the industry: "Sugar will not return to this country; it belongs to the period of slavery."[21]

In 2011, Cuba abolished the MINAZ and placed the sugar agroindustry as a whole under the stewardship of the AZCUBA Business Group, a newly-created organization that reports directly to Council of Ministers.[22] AZCUBA has been assigned responsibility for all aspects of the sugar agroindustry, including sugar-

20. Mill size or vintage of the mill's capital stock were not the only variables determining which mills were eliminated, with availability of sugarcane also an important consideration. Thus, 2 of the mills built in the 1980s were among those that were shuttered as part of the restructuring plan: Batalla de Santa Clara in Camajuaní, Villa Clara province (6000 tons daily grinding capacity) and Jesús Suárez Gayol in Santa Cruz del Sur, Camagüey province (7000 tons daily grinding capacity). Alvarez and Pérez-López, op. cit.

21. Wilfredo Cancio Isla, " La huella del 2005 en Cuba y el exilio," *El Nuevo Herald*, December 30, 2005.

22. This section draws from Jorge Pérez-López, "The Restructuring of the Cuban Sugar Agroindustry: A Progress Report," *Cuba in Transition—Volume 26* (Washington: Association for the Study of the Cuban Economy, 2016).

cane production, sugar production, production of derivatives (from sugarcane and sugar), and electricity generation. At least on paper, AZCUBA appears to be a business-oriented organization, focused on "managing the units that comprise the sugar agroindustry, to produce sugars, electricity, derivatives, and food products at prices that are competitive internally and internationally."[23]

The performance of the sugar agroindustry improved somewhat immediately after the establishment of AZCUBA. In 2010 and 2011, the two years prior to its establishment, sugar production was about 1.2 million tons; in 2012, the first *zafra* after the creation of AZCUBA, production rose by 300,000 tons (25%) although still to an anemic 1.5 million tons and rose in the following years to reach as high as 1.7 million tons in 2015. However, the steady increase in sugar production ended with the 2016 zafra, when production fell to 1.4 million tons, 18% lower than the 1.7 million tons produced in 2015.

Sugar production since 2016

The AZCUBA leadership was optimistic about 2017 sugar production. By early December 2016, 27 sugar mills had already started operations, the largest number of mills starting grinding operations so early since the late 1990s,[24] and an additional 18 were getting ready to start, so that by the end of calendar year 2016, 45 mills would be in operation. Early in the next year, 9 more mills would come on line, so that a total of 54 mills would be in operation. According to AZCUBA officials, sugarcane availability for the 2016–2017 *zafra* would exceed the previous year's by 12%.[25] The intention was for the *zafra* to be completed in 140 days,[26] substantially shorter than the 170–180 milling days for the four previous *zafras* and undoubtedly a good omen for efficiency,[27] but still considerably longer than the 90–100 days anticipated in the restructuring plan.

Despite the severe drought conditions that prevailed in the country, AZCUBA officials reported that sugar production in 2017 expanded to nearly 1.7 million tons, or by 20% compared to 2016. While positive about the sugar production level and suggesting that the industry was on track to recover, AZCUBA officials nevertheless stressed problems faced by the agroindustry in the 2016–2017 *zafra*, particularly failures in the transportation of sugarcane from fields to mills, delays in the importation of spare parts and equipment, and electricity interruptions that combined to prevent substantial quantities of sugarcane from being harvested.[28]

The 2017–2018 harvest, which was expected to build on the positive trend of the previous campaign, turned out to be disastrous. In September 2017, as fields were being prepared for harvesting, Hurricane Irma battered the island, traveling from east to west over the island's sugarcane areas: it flooded and flattened sugarcane fields, damaged 40% of sugar mills

23. Federico Sulroca Domínguez, "AZCUBA: un nuevo modelo de la agroindustria cañera cubana," Chapter 4 in Mario González-Corzo, editor, *La agroindustria cañera cubana: transformaciones recientes* (New York: Bildner Center for Western Hemisphere Studies, City University of New York, 2015). AZCUBA's website (http://www.azcuba.cu) states that AZCUBA consisted of 25 entities, of which 13 were regional sugar enterprises that operated the active sugar mills as well as agricultural enterprises that supplied sugarcane to the mills and power generation facilities, 10 were national-level support enterprises that provided services to producers, and the rest were research and training institutions. The regional sugar enterprises were also responsible for business units that were engaged in the process of liquidating assets of the nearly 100 mills that are no longer in operation. In addition to sugar mills, AZCUBA operated 10 sugar refineries, 12 distilleries, 3 plants that manufacture CO^2, 2 glucose manufacturing plants, 16 rum factories, 1 plant that produces sorbitol, 2 factories that produce bagasse boards, and 35 animal feed production plants. The installed generating capacity of the sugar industrial complex was about 532 gigawatts.

24. Typically, Cuban sugar *zafras* start around mid-November and conclude at the end April of the following year, in advance of the heavy May rains setting in. The bulk of sugar production takes place during the January-April interval. Often, sugar production is attributed to the year when the *zafra* is completed even if some was actually produced the previous year.

25. "Comienza la zafra azucarera con más centrales desde década del 90," *Cubadebate*, December 8, 2016.

26. Pilar Montes, "Cuba's Sugar Harvest (2016–2017) Begins," *Havana Times*, December 3, 2016.

27. "Inicia zafra azucarera 2016–2017," *Cubadebate*, November 9, 2016.

28. "La zafra azucarera de Cuba creció en un 20 por ciento en 2017," *Cubadebate,* May 30, 2017.

and several warehouses, and disrupted the electricity distribution system.[29] AZCUBA officials stated that, in the aftermath of the hurricane, the *zafra* would be conducted under "complex conditions."[30] Initially, officials predicted that because of the damage attributable to the hurricane, the sugar crop would amount to 1.6 million tons, an estimate that was later reduced to 1.3 million tons and 1.1 million tons. Considering that Cuba consumes roughly 600,000–700,000 tons of sugar domestically and it has commitments to export roughly 400,000 tons of sugar annually to China, industry analysts predicted that Cuba would be forced to import sugar.[31] The production level of 1.1 million tons in 2018 came close to the results of the 2010 *zafra* and to the production levels at the start of the Republic.[32]

The poor results of the 2018 harvest, according to Second Secretary of the Communist Party of Cuba José Ramón Machado Ventura, meant that in 2018 Cuba incurred the opportunity cost of not being able to export 400,000 tons of sugar that had been committed to a foreign buyer.[33] Moreover, according to press reports, in 2018 Cuba for the first time imported significant quantities of sugar (40,000 tons from France) in order to meet domestic demand, with state stores in Havana selling to the public, pursuant to the rationing system, French-origin beet sugar.[34]

Cuban sugar industry officials were optimistic about the rebound of the industry in 2019, setting targets for production of 1.5 million tons of sugar and exports of 920,000 tons, 50% higher than the previous year.[35] Another source, reportedly based on information from AZCUBA, stated that sugar production for 2018–2019 would be 1.7 million tons, with 54 sugar mills in operation.[36] Despite a promising start for the campaign and encouraging results during the so-called *zafra chica* (production from the start of the campaign through December 31), in February 2019, Cuban officials revised plans and shifted resources, terminating production in mills that had shown low efficiency levels and reassigning their sugarcane to other better performing mills.[37] In March, sugar mills in the central provinces were urged to redouble their production efforts, as units in the eastern provinces were hopelessly mired in a morass of machinery breakdowns, delays in obtaining imported replacement parts for mills and tires for transportation equipment, and poor weather.[38] In early May, a high-level meeting, chaired by President Miguel Díaz-Canel, brought together Communist Party and sugar industry officials, to brainstorm how to salvage the 2018–2019 *zafra* and execute the sugarcane planting plan for the 2019–2020 *zafra*.[39]

From information provided by an AZCUBA spokesperson it can be estimated that sugar production during the 2018–2019 *zafra* was roughly 1.4 million tons, based on a reported increase of 31% in sugar production from the previous year (1.1 million). The AZCUBA report states that none of the 13 sugar-producing provinces met its production plan, and

29. Ibid.

30. "Cuba: Zafra azucarera se realizará en condiciones complejas debido a huracán Irma," *Cubadebate*, October 25, 2017.

31. Marc Frank, "Disastrous Cuban harvest may force imports—and reform," Reuters, May 24, 2018.

32. "La zafra termina antes de tiempo y con pésimos resultados," *Diario de Cuba*, June 5, 2018.

33. "Machado Ventura vaticina el resultado de la zafra," *Diario de Cuba*, June 7, 2019.

34. "Cuba, antes reina del azúcar, ahora la importa de Francia," *El Universo* (Guayaquil, Ecuador), October 24, 2018.

35. Marc Frank, "Cuba sees sugar recovery, more exports, after bitter harvest," Reuters, December 24, 2018.

36. "Cuba inicia la zafra con la meta de producir 1.7 millones de toneladas de azúcar," *14ymedio*, November 3, 2018. The information source does not elaborate on whether all 54 mills in operation would be producing sugar or some would be producing molasses and cattle feed.

37. "Cuba: Sugar Harvest Behind Schedule," *Periodico26*, March 13, 2019.

38. Dimas Castellanos, "¿Desde cuándo y hasta cuándo Cuba incumplirá la producción de azúcar?," *Diario de Cuba*, April 9, 2019.

39. "Chequea Díaz-Canel actual contienda azucarera en el país," *Cubadebate*, May 7, 2019.

only 17 of 54 mills met their production targets.[40] That production in 2018–2019 was roughly 1.4 million tons also obtains another report from AZCUBA issued well after the sugar harvest had been completed with stated that production was 13% below the aforementioned target of 1.7 million tons in 2018–2019.[41]

The main challenge currently faced by the Cuban sugar agroindustry is in the field, in the agricultural sector—from sugarcane production, harvesting and timely transportation of cut sugarcane to mills—rather than in the sugar mills that grind sugarcane and produce sugar and other derivatives. As Communist Party official Machado Ventura rhetorically asked in mid-2019, "what do we want sugar mills for, if we do not have sugarcane?"[42] Looking to the upcoming 2019–2020 sugar campaign and beyond, President Díaz-Canel has called for Cubans to work "intelligently," adapting to climatic challenges and allocating scarce financial and energy resources wisely to the *zafra* and to the planting of sugarcane.[43]

To sum up, Figure 3 shows Cuban annual sugar production during the period 1959–2019 plotted annually (red trace) and as a three-year moving average to smooth out year-to-year fluctuations (blue trace). As was the case for the period 1902–1959, the performance of the industry over the entire period neatly breaks up into two segments, a period of ascending production lasting through the end of the 1980s, followed by a period of sharp production decline through 2019. The two solid lines superimposed on the plot provide a rough indicator of the trend of sugar production in the two sub-periods, ascending through the end of the 1980s and sharply declining since then.

CONCLUDING REMARKS

As this paper has documented, over the six decades of Castroist rule in Cuba, the sugar industry has gone from leader to the back of the pack both domestically and internationally. The Cuban sugar industry today is but a specter of what it once was. Sugar is no longer the engine of the economy or the leader in generating foreign exchange. Where once there were over 150 sugar mills that were centers of employment and represented the lifeline of rural communities, fewer than 60 exist today. Many towns decimated by the shutdown of mills and the loss of their main employment source. Former sugar workers and their families have migrated from the countryside to major cities or to tourism areas whether there are some employment possibilities.

Sugar production levels in the last five years have been in the range of 1–1.5 million tons per year, matching production levels at the beginning of the Republic, and a fraction of the about 8 million tons per annum that Cuba produced during the 1980s. The recent production levels are insufficient to meet domestic consumption needs and export commitments to creditor countries. The situation is so dire that in some years, Cuba, the epitome of sugar production in the Americas and worldwide, is importing beet sugar from France to meet export commitments and to sell to the Cuban population as part of its monthly rations. Cuban essayist Roberto Alvarez Quiñones, considering the travails of the sugar industry and the economic crisis in which Cuba is immersed, has offered a variant on the saying mentioned in the introduction that seems more apt to the situation today: "sin azúcar y sin país."[44]

40. Marc Frank, "Cuban sugar harvest one of the lowest in 120 years, exports met," Reuters, June 9, 2019.

41. Orlando Freire Santana, "¿Qué significa el incumplimiento de la zafra para el resto de la economía cubana?," *Diario de Cuba*, August 20, 2019.

42. "Machado Ventura vaticina el resultado de la zafra," *Diario de Cuba*, June 7, 2019.

43. "A preparar con inteligencia la próxima zafra azucarera, llama Presidente de Cuba," *Cubadebate*, June 12, 2019.

44. Roberto Alvarez Quiñones, "Sin azúcar y sin país," *Diario de Cuba*, November 29, 2016.

Appendix
THE DECLINING QUANTITY AND QUALITY OF CUBAN SUGAR STATISTICS

The gap in the quantity and quality of Cuban sugar industry statistics before and after 1959 is remarkable.[45] As a result, it is very difficult to carry out a detailed secular comparison of the conditions and performance of the industry.

Through the 1950s, sugar industry statistics were abundant, regularly published, and generally of high quality. Contributing to this wealth of statistics were both governmental and private sector efforts. It is fair to say that the sugar industry was the subject of the most robust set of statistics for any economic activity in Cuba, reflecting the leading role of sugar in the national economy. Consistent with the diminished role of the industry and the lack of transparency of the Cuban government regarding economic matters, sugar industry statistics in recent years have been reduced to such an extent that literally only a handful of statistics are currently published.

Sugar industry statistics through the 1950s: Since the beginning of the Cuban Republic, detailed sugar production statistics for each *zafra* were published by the General Statistics Directorate of the Secretaría de Hacienda (Ministry of Finance) in the publication *Industria Azucarera y sus Derivados*. This annual publication, available for the period 1903–1931, was superseded in 1937 by the *Anuario Azucarero de Cuba* (AAC), published by the private-sector journal *Cuba Económica y Financiera*.

Published uninterruptedly from 1937 through at least 1962, AAC followed essentially a uniform format. It contained a wealth of statistics on industrial and agricultural aspects of the sugar industry gathered from official and commercial sources. For industrial activities, the statistics were derived from annual censuses of the industry and reported at the level of each individual mil: grinding and sugar production capacity, annual sugarcane ground and raw sugar production, days in operation for each campaign, and industrial yield. For agricultural activities, the ACC also reported sugarcane production quotas assigned to medium-size and large sugarcane producers (*colonos*) in the catchment area of each mill. Moreover, the ACC also contained summary statistics on sugar exports, including statistics by port of export and country of destination. Separately, more finely detailed sugar trade statistics, including volume and value of exports by country according to standard international trade nomenclatures, were published in the annual *Comercio Exterior*, also published by the General Statistics Directorate of the Ministry of Finance; publication began in 1902 and ended in 1959.

A source of granular information on the sugar industry of Republican Cuba at the level of each sugar mill was the *Manual Azucarero de Cuba—The Cuba Sugar Manual*, initially published in 1937 by Gilmore Publishing Company of New Orleans, and also published in the 1940s and 1950s. The latest volume seems to be for 1958. To illustrate the granularity of the information, the volume for 1955, for example, not only contains production and efficiency indicators or each sugar mill for the last three decades, but also detailed information on milling capacity, variety of sugarcane milled, detailed information on the machinery and equipment of each mill (e.g., specifications of grinders, crystallizers and centrifuges, steam plant, electric plant), and key management personnel.[46]

Sugar industry statistics since 1959: The property relations and structural changes that began to occur in 1959 had a profound impact on the availability of

45. This section draws from Pérez-López, *The Economics of Cuban Sugar* (Pittsburgh: University of Pittsburgh Press, 1991), Appendix 1, pp. 233–240.

46. *The Gilmore Manual Azucarero de Cuba—Cuba Sugar Manual* (New Orleans: The Gilmore Publishing Company, 1955).

sugar sector statistics.[47] Through several sets of actions—the confiscation in early 1959 of land and industrial property owned by former President Batista and his allies, the Agrarian Reform Law of May 1959, and the wholesale nationalization of foreign and domestic private property in the summer and fall of 1960—essentially brought agricultural and industrial activities associated with sugar production under government control. As mentioned earlier, the AAC continued to be published for a short time after 1959, with the last issue apparently corresponding to 1962, when the industry was largely under state control; beginning with the issue for 1961, the AAC was published under the aegis of the Ministry of Foreign Trade.[48]

With the turn toward socialism, Cuba dismantled old institutions and created new ones more attuned to its new governance philosophy. Thus, the Junta Central de Planificación (Central Planning Board, JUCEPLAN) was created in March 1960; among other duties it took over the function of gathering and disseminating national economic statistics. There is a hiatus in Cuban economic statistics for the early 1960s, with JUCEPLAN publishing the first statistical compendium, *Boletín Estadístico de Cuba* (BEC), in 1964. Subsequently, the BEC was published annually through 1971, when it was replaced by another JUCEPLAN publication, *Anuario Estadístico de Cuba (*AEC); AEC has been published annually since then, albeit with some interruptions.[49] While the level of detail regarding the sugar industry was not as fine as in the AAC and data on specific production units (sugar mills) was missing, the BEC and AEC contained a great deal of statistical information on agricultural and industrial aspects of sugar production. For example, the 1987 issue of the AEC contained the following statistics regarding sugarcane agriculture:

- area devoted to sugarcane plantings (broken down by state and private sector);
- plantings by varieties of sugarcane (by state and private sector);
- new plantings; and
- agricultural services (irrigation, fertilizer applications) related to sugarcane agriculture by state and private sectors.

Regarding industrial aspects of sugar production, the 1987 issue of the AEC contained the following statistics regarding sugar and derivatives production:

- volume of sugarcane ground (nationally and by province);
- sugarcane ground by *zafra* day and per effective grinding day;
- potential grinding capability of sugar mills;
- length of the *zafra*, effective grinding days and down time of mills, by reason for the interruption;
- sucrose content of sugarcane;
- sucrose losses in the industrial process;
- production of raw sugar (in physical terms and in terms of production standardized to 96º degrees polarization); and
- production of refined sugar.

Finally, BEC and AEC both contained sugar export statistics at aggregate levels and also broken down by country of destination of exports. This level of detail on exports allowed, for example, for the calculation of unit value of exports for selected importers of Cu-

47. Needless to say, these forces affected property relations and the structure of the economy at large, and therefore all economic statistics produced in the country. For a thorough discussion see Carmelo Mesa-Lago, "Availability and Reliability of Statistics in Socialist Cuba," *Latin American Research Review*, Part I (Winter 1969) and Part II (Summer 1969).

48. Ronald H. Chilcote, *Cuba 1953–1978: A Bibliographical Guide to the Literature* (White Plains: New York: Kraus International Publications, 1986) refers to an issue of the ACC for 1963 in the holdings of the Biblioteca Nacional José Martí in La Habana, while Mesa-Lago does the same with regard to an issue for 1965.

49. The Directorate of Statistics of JUCEPLAN was superseded in 1976 by the State Statistical Committee (Comité Estatal de Estadísticas, CEE), which became the National Statistical Office (Oficina Nacional de Estadísticas, ONE) in 1994 and more recently the National Statistical and Information Office (Oficina Nacional de Estadística e Información, ONEI). See ONE, *Características y Evolución del Sistema Estadístico Nacional de Cuba* (La Habana, 2007).

ban sugar (e.g., the former Soviet Union), which was important for purposes of studying terms of trade.

Publication of the AEC was suspended after the 1989 issue because of the Special Period crisis. When publication resumed in 1994, it was a much trimmed-down version. From this point forward, the quantity of economic statistics in general published in the AEC, and more specifically of statistics regarding the sugar industry, declined drastically. The most recent issue of the AEC (for 2018) contains a single table with basic indicators of the sugar industry for the six most recent *zafras*; information on annual production of raw and refined sugar is provided in a separate table dealing with output of the manufacturing sector, as are also a table with statistics on area devoted to sugarcane cultivation, sugarcane production, and agricultural yields, and quantity and value of sugar exports as part of a set of tables on foreign trade.

To add to the lack of transparency about the performance of the industry, recently AZCUBA officials have chosen not to publicize actual sugar production volumes but rather to couch their reports on *relative* developments, for example reporting that production in a given crop year was some percentage higher or lower than the target for that year (which may or may not be readily knowable to the general public) or some percentage higher or lower than production in a previous period (which, again may or may not be readily knowable).