

The Interwar Turning Point in U.S.-Cuban Trade Relations:  
A View Through Sugar-Company Stock Prices

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Among western countries, Cuba stands out as an enigma. Whether one sees it as heroic or disastrous, the revolutionary regime's defiance of U.S. hegemony has been a symbol of anti-imperialist aspirations throughout Latin America. But now, as a political transition is anticipated, the opportunity may arise for the two countries to leave behind their differences and enter a new

era. If this should happen, there will be a need for a new understanding of the old relationship. We have become so accustomed to seeing Cuban-U.S. relations through the lens of cold war that their former close ties are all but forgotten. By contrast, in 1914, a contemporary observer would never have predicted the rise of a Fidel Castro or a revolution that would completely isolate itself from the United States. To the contrary, despite its problems, Cubans were conscious of how their country thrived from its economic integration with the United States. By the standards of the day, Cuba was an emerging country, and incomes per capita were comparable to the best performing Latin American countries, except Argentina.

Cuba's economic prospects changed dramatically, in appears, during the interwar period, but the causes are not fully understood. A predominant view criticizes the "penetration" of foreign capital. The version that is predominant among historians today maintains that U.S. sugar refining and banking interests used privileged access to capital and influence in Washington to appropriate the returns from the Cuban sugar industry and retard growth of national economy. The usual evidence cited is the structure of ownership in the sugar industry – by the mid-1920s, 70 percent of the milling capacity was owned by North American corporations, much of it concentrated in the hands of large refiners and banks.

There are some problems with this view. The view hinges on the proposition that foreign ownership diverted the wealth-generating capacity of national resources by permitting foreign capitalists to appropriate them. The high incidence of foreign ownership of sugar properties, which is the observation typically submitted as evidence, is only evidence of the presumed cause, not of the proposed effect. The proposed effect is a prediction of a standard model of imperialism that may be incorrect. Yet, when one looks at evidence of effects, rather than evidence of factors in the conventional model, the patterns observed do not reflect the movements in the factors.

Foreign-owned sugar companies do poorly and appear to do no better than nationally owned mills. Furthermore, ownership and other structural variables in the conventional view tend to exhibit a “structural drift” rather than sudden change, but quantitative measures of the performance of the Cuban sugar industry suggest the importance of catastrophic events or shocks to the industry.

This paper offers another explanation of Cuba’s long-run economic crisis by examining the long-run performance of securities issued to finance foreign investments in Cuba, focusing especially on the interwar period, when the prosperity of the first two decades of the twentieth century ended, and the economy never fully recovered. We use stock prices of sugar companies to compare the performance of companies operating in Cuba with companies in the mainland United States and Puerto Rico from 1921 to 1939. We find that policy shocks explain long-run performance of sugar companies, the most important of which was the effects of the sugar tariff enacted in 1930 as part of the Smoot-Hawley tariff. The study speaks to a larger question: the conventional view indicts global capitalism itself as the source of economic distress in Cuba and breakdown in U.S.-Cuban relations in the interwar period. Our findings suggest that barriers to trade that deflected international capital flows away from otherwise sound investments in Cuba may have been the source of the problem.

### *Preliminary Discussion*

Before 1898, American investments in Cuba were limited, but after the U.S. military occupation following the Spanish-American War, unusual opportunities attracted American investors. The accumulation of U.S.-owned assets rose from \$45 million in 1896 to \$211 million in 1906 (See Table 1). Five years later, accelerating infusions of capital from North America

were feeding one of the most prosperous periods of economic growth in Cuban history.<sup>1</sup>

From 1904 to 1920, Cuba experienced an almost frenzied expansion of the sugar industry, earnings from sugar exports grew by a factor of five. Julián Alienes Urosa estimated real GNP doubled during the same period.<sup>2</sup> As Table 2 indicates, sugar exports, which accounted for 80 percent of all export earnings in that period, led this growth almost exclusively. Although interrupted by a sharp postwar financial crisis in 1920-1921, the phase of prosperity continued until the commodity crisis of the latter 1920s. However, by the time of the Great Depression, the Cuban economy fell into complete ruin. New foreign investment in Cuba vanished in the 1930s, and the prosperous times of the first quarter of the twentieth century were never restored.<sup>3</sup>

After World War I, the lifting of wartime sugar price controls resulted in a sharp postwar crisis in Cuba. Figure 1, which sugar prices from 1917 to 1939 shows how wartime controls kept sugar prices artificially low from 1917 through 1919. When controls were lifted in 1920, the market entered a speculative bubble. When it burst, a large share of the current Cuban crop was left unsold; and its holders, who had produced or purchased it at high prices, lost everything.<sup>4</sup> Although U.S. ownership had increased since 1898, most of the criticism focuses on the sudden increase in foreign ownership that came about as a consequence of the fallout from the financial crisis of 1921. Table 3 gives estimates of the share of North American ownership and industrial concentration in the sugar industry. The fallout of 1921 crisis caused a massive failure of mills and two important Cuban and Spanish-owned banks. North American banks, which had about 0.5 percent of the Cuban sugar sector before 1920, suddenly found themselves possessing 7

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<sup>1</sup> Lewis (1938), U.S. Dept. of Commerce (1956). There was also substantial British investment in the country's relatively well-developed system of railroads. Zanetti and García (1998); Rippy (1948); Stone (1999).

<sup>2</sup> Alienes Urosa (1950), Zanetti Lecuona (1989).

<sup>3</sup> Wallich (1950).

<sup>4</sup> Collazo (1994).

percent of Cuban sugar milling capacity, from bad debt.<sup>5</sup> From these figures, Pino-Santos's emphasis on the role of foreign banks appears exaggerated.<sup>6</sup> Nonetheless, American companies overall controlled 38 percent of the sugar manufacturing capacity before the war but acquired 65 percent by 1924. The top four firms, all American corporations, owned 49 percent of the industry's capacity by 1929.

But if North American companies were successful in appropriating the prime resources of Cuba's sugar industry, one might expect it to show up in performance measures. How did American corporations operating in Cuba perform after 1921 and particularly through the economic crisis?

### *The Data*

By 1909, the preferential tariff treatment of the Cuban sugar industry (combined with its capacity for expansion), had created a unique situation in the U.S. market for sugar. Cuba had expanded so as to crowd out all other duty-paying sugar imports in the U.S. market.<sup>7</sup> After this date, the U.S. sugar market was served almost entirely by three groups of suppliers. Table 4 shows the source of sugar in the U.S. market by "supplier area," as they were called. The three classifications are: domestic (mainland) beet and cane sugar; the insular possessions, Hawaii, the Philippines, Puerto Rico, and the Virgin Islands; and Cuba and other foreign suppliers. The insular possessions, were not referred to as "domestic," but they all had rights of duty-free status.<sup>8</sup> Duty-paying "supplier areas," as they were called, were Cuba, which paid 80 percent of

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<sup>5</sup> Jenks (1928), Wallich (1950).

<sup>6</sup> Pino-Santos (1973), p. 93.

<sup>7</sup> Prior to that time, the net-of-duty price in the U.S. market was above the price in the world market. After it, the protected U.S. price was determined by the world price plus the tariff on Cuban sugar exported to the United States.

<sup>8</sup> Imports from the Philippines, at times, were restricted, but not during the period we are discussing, until the enactment of the U.S. Sugar Program in 1934, which established universal production and import quotas, discussed below. Ballinger (1978).

the full-duty, and other foreign suppliers, which paid the full duty. Except for abnormal years, less than 1 percent of sugar consumed in the United States in the 1920s and 1930s came from countries that paid the full duty.

Our data are constructed from the weekly (end-of-week) prices of common stock of sugar companies. All the companies specialized in either raw cane sugar or beet sugar from Cuba, Puerto Rico or U.S. domestic beet sugar. Thus, each of the three supplier-area classifications in the U.S. market is represented. The data were compiled from all common stocks of raw-sugar-processing companies operating in Cuba reported regularly in the *New York Times* and the *Wall Street Journal*. They include stocks traded on the New York Stock Exchange and the New York curb market, over-the-counter stocks and some regional exchanges.<sup>9</sup> Overall, 20 companies are represented, including 11 prominent Cuban sugar companies, all American-owned; 5 major domestic beet sugar companies; and 4 major Puerto Rican companies. The companies in the data set owned multiple mills and were by and large among the largest and most technically advanced in each of their supplier areas. Out of Cuba's 160, or so, active mills, the companies in the sample owned 47 mills, which represented between 45 and 54 percent of Cuba's sugar production capacity. In domestic beet sugar, which was the most concentrated industrially, the companies in the data set represent between 67 and 71 percent of that supplier area's milling capacity. The 4 Puerto Rican firms represented were referred to in trade journals as the "top four," because they stood out in size relative to the rest of the industry, representing between 20 and 43 percent of Puerto Rican production capacity.

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<sup>9</sup> The main sources for the stock prices were the *New York Times*, and *Wall Street Journal*. Missing values were filled, where possible, from the *Commercial and Financial Chronicle*, and sugar trade journals, *Louisiana Planter*, and *Facts About Sugar*. Outstanding shares, descriptions of stock issues, and company histories were obtained from the annual Farr & Co., *Manual of Sugar Companies*, and dividend payments were collected from serial publications of Standard Dividend Service, *Fitch Dividend Record*, and the *Commercial and Financial Chronicle*. The Havana Bolsa traded railroad, public utility, and various public and private debt issues (quotes are found in the daily *Diario de la Marina*), but in those years, it did not trade sugar-company stocks.

### *Sugar-Company Equity Indices*

The indices shown in Figure 2 give estimates of the market value of the outstanding equity of sugar processors in each of the three supplier areas. The indices  $E_j$  are constructed as

$$E_j = \left( \sum_i [p_{ij}(s_{ij}^c + s_{ij}^p)] \right) \cdot \alpha_j^{-1} \quad (1)$$

where  $p_{ij}$  is the share price of firm  $i$  in supplier area  $j$ ; and  $s_{ij}^c$  and  $s_{ij}^p$  are the outstanding common and preferred shares, respectively, of firm  $i$  in supplier-area  $j$ .<sup>10</sup> The supplier areas,  $j$ , are the U.S. domestic beet sugar, Puerto Rico, and Cuba.

The factor,  $\alpha_j^{-1}$ , rescales the indices to give a rough estimate of the relative total value of sugar-company equity in each of the three supplier areas. The magnitude,  $\alpha_j$ , is the share of the production capacity of all the firms in sample for supplier area  $j$  relative to the aggregate production capacity of all firms in supplier area  $j$ . Production capacity is measured by the sum of daily per ton processing capacity at each factory.<sup>11</sup>

Observing the patterns of movement in Figure 2, two things stand out. First, comparing the supplier areas, the timing of the fall in the series over the period of the 1920s commodity crisis up to and after the NYSE crash is noticeably different. The Cuban sugar-company stock prices fall much earlier, beginning their descent in January 1927. The other two fall at or after the crash of the stock exchange. The Puerto Rican index turns downward by May 1929, but it takes a sharp plunge beginning in the week of October 29. The beet sugar index also drops

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<sup>10</sup> Share prices are weighted by the sum of common and preferred shares outstanding to account for, and maintain continuity through, recapitalizations of some important companies that converted preferred to common shares. To put them on a comparable basis, outstanding shares were par-adjusted to render \$1 par equivalent shares. Capitalization histories were obtained from Farr & Co., *Manual of Sugar Companies*.

<sup>11</sup> See longer version for explanation of the scale factor.

sharply at the crisis, but it shows some recovery in the months until the week beginning May 5, 1930.

Second, the recovery in each of the three supplier areas stands out. Most striking is the beet sugar industry, which recovered abruptly between January and July of 1933 to a level comparable, or slightly above, its pre-crisis level. Puerto Rico closely tracked beet sugar's ascent. Cuba's recovery was partial and with much greater instability.

What explains these contrary movements in supplier-area stock prices? Cuban sugar-company equity appears more sensitive to the short-run price of sugar than domestic beet and Puerto Rican companies. But why? The simple answer is that Cuban sugar, which was the only duty-paying sugar in the United States was dependent on the the U.S. tariff, and the tariff was endogenous to the price of sugar. The brief recovery in the price of sugar in 1926 reflects an attempt on the part of the Cuban government to stave off a threatened increase in the sugar tariff using production restrictions. Stock prices of sugar companies operating in Cuba turned upward with the price of sugar in 1926 but followed it as well downward in 1927. The increase in the sugar tariff that would come about as part of the omnibus Hawley-Smoot tariff in 1930 began to be anticipated as early as 1927. Of course, as that expectation weakened stock prices of Cuban sugar companies, it strengthened share prices of companies in duty-free areas, as we observe in Figure 2. The next section outlines some of the main events that underlay these commodity and stock price movements.

*The Commodity Crisis and Tariff Endogeneity*

The evidence of the endogeneity of the tariff is abundant (more so than can be presented in this paper).<sup>12</sup> It begins with the U.S. Congress' deliberations over the 1922 Fordney-McCumber tariff act. A legislative battle broke out over the sugar tariff in late 1921. While eastern seaboard refiners and Americans with direct investments in Cuba lobbied in Washington for a lower sugar tariff, Secretary of Commerce, Herbert Hoover, and Senator Reed Smoot (R-UT), a high-ranking member of the Senate Finance Committee, pressured the Cuban government, banks and refiners with investments in Cuban sugar, on behalf of domestic beet sugar interests, to restrict Cuban sugar production, which the Cuban government and American investors in Cuba rejected. (U.S. refiners were the principal buyers of Cuban raw sugar.)

The pressure from protectionists was relieved by the high sugar prices of 1923 and 1924. J.W.F. Rowe (1930) explains that the high prices were caused by rapid increase in the world demand for sugar and slow postwar recovery of the European beet sugar industry, interpreted at the time as a signal that expansion of world sugar production capacity would be needed. The downward movement from the end of 1924 was caused by greater-than-expected recovery of the European beet sugar industry in 1924-1925, and increased production in the U.S. insular

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<sup>12</sup> Industry participants and analysts were well aware of the tendency of countries with high-cost sugar industries to raise tariffs in response to a falling price of sugar. Gustav Mikusch, an Austrian sugar expert, published a report on tariff increases by eight European countries in 1925, in the U.S. trade journal, *Facts About Sugar*, on Feb. 20, 1926. Mikusch remarked, "The reason for these numerous advances in tariff rates undoubtedly is to be found in the low price of sugar during the past year. With imported cane sugar selling at prices below the cost of production in Europe the beet growing countries of this continent have felt the necessity of erecting higher barriers to protect their home industries." The minutes of meetings of the International Sugar Council, an exporting-country cartel formed in 1931, are replete with references to tariff endogeneity (See minutes for the years 1931-1935 in the Cuban National Archives, Fondo ICEA.); likewise, in the private business papers of Czarnikow-Rionda, the major New York sugar brokerage (See University of Florida at Gainesville, University Archives, Braga Brothers Collection, ser. 10c.). The Java sugar industry faced an explicit endogenous tariff response in formulae established by the Indian Tariff Board. See India, Tariff Board (1931, 1933, 1938). U.S. domestic sugar industry representatives increased demands for protection when prices were falling. In 1922, Louisiana sugar interests stated that if the price would stabilize at 2.9 cents, "they could live with the present tariff." Cable from W.R.M. (State) to Sumner Welles, Feb. 24, 1922. USNA 837.61351/347. In 1929, Stephen Love, President of the U.S. Beet Sugar Association, argued that with the price at 2 cents, it was necessary to raise the tariff to prevent "huge" losses. *Facts About Sugar*, March 16, 1929. Congress considered a "sliding scale" that would tie the sugar duty directly to the price, but producers worried that it would not be sufficiently flexible (for further discussion see Smith, 1960, pp. 57-66).

possessions.<sup>13</sup> European beet sugar production went from 5.6 to 7.8 million short tons. Also, stimulated by the recent tariff increase, U.S. domestic production showed a slight upward trend while insular-possession sugar expanded greatly – production in Puerto Rico by more than 30 percent, and the Philippines by 80 percent from 1922 to 1925.<sup>14</sup> Then in 1925, Cuba had a record crop of 5.9 million short tons – 27 percent above 1924, also a record crop. The consequence was that, by September 1, 1925, unsold physical stocks of sugar were 1.8 million short tons, almost double the usual end-of-crop-year carryover. Rowe says that “sugar producers of the world were stunned with surprise” by the accumulation of stocks. This was, however, just the first sign of a troubling market overhang that grew to 4 million tons by 1929.<sup>15</sup>

We know from Kindleberger (1973) that all major commodities markets exhibited similar patterns of falling prices and mounting physical stocks in the late 1920s. In the case of sugar, the first signs of commodity crisis were an important turning point for Cuban sugar politics. As the problems of “overproduction” became visible, Cuban mill owners (especially those with older mills and less access to capital) argued that the aggressive expansion of American sugar mills was irresponsible in the postwar sugar market. Indeed, the American experts, who had been forecasting a slower recovery of European beet sugar production, were caught by surprise. National City Bank, for example, in 1919 had forecasted a global shortage of sugar throughout most of the twenties, which was a factor in their strategy of investment and expansion.<sup>16</sup> Forecasts emerged that Cuba would have another record crop in 1926. The Cuban Hacendados (Sugar Mill Owners’) Association recommended that the Cuban President impose restrictions on

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<sup>13</sup> Rowe (1930), p. 7.

<sup>14</sup> Authors’ calculations; Rowe (1930), p. 7; U.S. Tariff Commission, 1934. Data from Moreno Fraginals (1978), Farr & Co., and Willett & Gray.

<sup>15</sup> Rowe (1930), p. 17. The four million ton figure is for Sept. 1, 1929 from Willett and Gray’s *Weekly Statistical Sugar Trade Journal*.

<sup>16</sup> National City Bank, *Cuba: Review of Commercial, Industrial and Economic Conditions in 1919*, excerpts reproduced in Smith (1963), *What Happened in Cuba?*, pp. 149-151.

the Cuban sugar crop using internal production quotas.<sup>17</sup> First implemented in May, 1926, and later extended to 1927 and 1928, crop restriction was intended to boost the price of sugar, but the reasons behind the producers' call to limit production were motivated by concerns about threats of increase protection in the U.S. market.

Most saw the 1926 crop restriction as a temporary measure that would be unsustainable without international cooperation. So, in 1927, the Cuban government sponsored a mission to Europe to seek an agreement with major sugar exporters in Europe for a joint effort to reduce exports and halt the price decline. Although, later, in 1931, the same parties came together and signed such an agreement, the initial attempt in 1927 failed. The sugar price weakened in part from realization that the international agreement would not materialize. By the summer of 1928, internal Cuban opposition to the crop restriction put its future in doubt. President Machado decreed to abandon it on December 27, 1928.<sup>18</sup>

Cuban share prices plunged sharply beginning in June, 1928, as observers forecasted that the uncontrolled Cuban crop of 1929 would be another record crop. As this occurred in the sugar market, Herbert Hoover, in his 1928 presidential campaign, pledged to increase tariffs on farm goods for agricultural relief, while beet sugar growers' associations in the west called for an increase in protection against cheap Philippine and Cuban sugar. After his victory, Hoover called for immediate tariff reform, initiating the deliberations in Congress that led to the notorious Hawley-Smoot tariff. In another study, we show that Senator Smoot and the sugar tariff became a pivotal issue in the contest over the tariff.<sup>19</sup> With Smoot now as chair of the Senate Finance

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<sup>17</sup> Zanetti (2004), pp. 66-67; Rowe (1930), p. 19.

<sup>18</sup> *Louisiana Planter and Sugar Manufacturer*, Oct. 20, 1928; *Facts about Sugar*, Dec. 29, 1928; Pérez Cisneros (1957), pp. 15-21; Zanetti (2004), pp. 77-78, 83-85.; B.B. R.G. 2 Ser.10c, Box 57 f. Gutiérrez – Rentschler – Machado 1928, Letter from José Gómez Mena, a prominent Cuban millowner, to Viriato Gutiérrez, President Machado's Secretary of the Presidency, Aug. 1, 1928.

<sup>19</sup> Dye and Sicotte, "The Institutional Determinants of the Hawley-Smoot Tariff."

Committee, which had jurisdiction over the tariff, domestic sugar interests were well-positioned to demand new protection. After eighteen months, the Hawley-Smoot tariff act went into effect on June 17, 1930, and the sugar tariff was increased from 1.7648 cents to 2 cents per lb. Cuban interests as they watched these events unfold had predicted that a 2-cent tariff would be ruinous for sugar producers in Cuba.<sup>20</sup>

The coincidence of falling values of sugar-company shares in Cuba and rising values in non-duty-paying areas from 1927 are explained by the same underlying two factors – an unstable sugar market and the endogeneity of protection in the United States. Excess long-run production capacity and the accumulation of unsold physical stocks drove the price down and elevated the uncertainty over when it might recover. The falling sugar price, then, raised the probability of a revision in the sugar tariff in the United States. Over the 1920s, as market conditions worsened and the threat of tariff revision in the United States grew, U.S. domestic sugar producers were assured of protection, Cuban sugar became a less attractive investment, and the non-duty-paying insular possessions (especially Puerto Rico and the Philippines) became more attractive.<sup>21</sup>

### *Sugar-Company Risk*

If sugar market instability and the risk of tariff revision of the late 1920s explain the realignment of equity values in the three sugar supplier areas, then these same factors should be visible in the systematic risk of the assets in question. Investors would have updated their assessments of the risk of investing in sugar in one supplier area relative to another based on the changes in tariff protection, exposure to market instability, or other significant changes; and they would have incorporated them, in different ways, into the expected rates of return on Cuban

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<sup>20</sup> Rowe (1930); Braga Brothers Collection, Series 10c.

<sup>21</sup> Hawaii had little remaining good cane land in which to expand.

shares, domestic beet sugar, and so on. If either market instability or threats of tariff revision had an adverse effect on the perceived forward distribution of returns from equity in sugar companies, say, operating in Cuba, they would compensate for bearing that risk by demanding a higher expected rate of return.

The conditions described produce two predictions about changes in the structure of systematic risk between supplier areas. First, risk assessed of Cuban sugar-company securities must have risen relative to U.S. domestic and insular-possession securities. Cuba bore a greater burden of any downward shock to the price of sugar in the world market and the risk of a smaller share of the protected U.S. market. For a given expectation about the demand for sugar, as investors in the sugar industry observed the mounting quantities of unsold physical stocks of sugar overhanging the market, they would adjust their risk assessments (relative to the sugar-industry average) upward for Cuban securities and downward domestic or insular-possession securities. Second, the timing of the alteration of perceived risk should coincide with key events that alerted investors either to the potential instability from “overproduction” and “overhang,” or the threat of tariff revision.

To investigate these implications, we adopt the “moving windows” event-study method of Willard, Guinnane and Rosen (1996) for finding “turning points” in a historical process using the information in asset prices. The approach exploits the notion that reactions in securities markets reveal information about investors’ views about how specific occurrences may affect the value of a security. The reader is referred to that work for an explanation of the technique.

We use a simple modification of the standard CAPM to construct the tests for breaks. Letting  $r_n$  be the average abnormal return for all sugar-industry securities, the usual CAPM relationship is:

$$r_n = \alpha_o + \alpha_1 r_m + \varepsilon_n . \quad (2)$$

where  $r_m$  is the abnormal return in the market overall, and  $\alpha_1$  represents the systematic risk of sugar-industry securities. The predictions at the beginning of this section, however, are about the systematic risk of sugar-company shares in one sugar supplier area, relative to the average for the sugar industry. These are not represented in equation (2), but they can be expressed by letting  $i$  represent sugar company  $i$  in supplier area  $j$ , and writing:

$$r_i = \gamma_o + \gamma_1 r_n + u_i \quad (3)$$

as an expression analogous to equation (2). It expresses the relationship between the abnormal returns of the firm and industry risk, where  $\gamma_1$  represents the risk premium on the firm's share relative to the average in the industry. Combining equations (2) and (3) produces the linear regression equation:

$$r_i = \beta_o + \beta_1 r_m + \beta_2 \varepsilon_n + u_i \quad (4)$$

where  $\beta_1$  is systematic risk associated with the market average, and  $\beta_2$  is the additional systematic risk that relates firm  $i$ 's risk to the average for the sugar industry.

To interpret, the standard CAPM distinguishes between two classes of risk—"market risk," which derives from events that affect all securities in the stock market, and "unique risk," which derives from events that are specific to  $i$ . Equation (4) identifies a third type of risk, relevant for our purpose—"industry risk," which derives from events that were specific to the sugar industry, commonly affecting all sugar-company stocks, but having no effect on non-sugar-related securities.

A given window, for the "moving windows" method, is constructed by selecting a time interval of data of fixed length, say,  $t_o, t_1, \dots, t_w$ , on which to estimate a regression model similar

to equation (4) but with the inclusion of dummy variables to test for a break. That produces the regression model:

$$r_i = \beta_o + \delta_o D + \beta_1(1 + \delta_1 D)r_m + \beta_2(1 + \delta_2 D)\varepsilon_n + u_i \quad (5)$$

where  $D$  is a dummy variable which is assigned zeros for all observations preceding the midpoint and ones thereafter. The test for each break is specified as a test of the insignificance of  $D$ , which is equivalent to a joint exclusion test on the coefficients  $\delta_i$  ( $i = 0, 1, 2$ ). Similar to Willard, et al., we choose a 104-week window. The test is performed iteratively on each possible 104-week window.

The data consist of a panel consisting of 22 firms and 1146 weekly observations running from January 15, 1921 to December 26, 1942. The regressions are performed by dividing the data into three separate panels, one for each supplier area, controlling for random effects. But rather than estimate the three related panels separately, we estimate them together using an SUR (seemingly unrelated) regression procedure.<sup>22</sup> This procedure conveniently accommodates the assumption that the  $\beta_k$  and  $\delta_k$  coefficients ( $k = 1, 2$ ) are identical within a given supplier area but differ across supplier areas. We thus obtain separate estimates of the coefficients in equation (5) for each supplier area using an integrated regression procedure. Three sets of common within-area coefficients,  $\beta_1, \beta_2, \delta_1$  and  $\delta_2$ , are generated, one for each supplier area,  $j$ , which are interpreted as average systematic risk estimates for each supplier area; that is,  $\beta_1$  is the pre-break systematic risk that associated with the market, and  $\beta_1 + \delta_1$  is the corresponding post-break risk measure. Our primary interest, however, is in the breaks and relative changes in systematic risk relative to the average in the sugar industry, captured by  $\beta_2$  and  $\beta_2 + \delta_2$ .

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<sup>22</sup> The regressions are estimated assuming an AR1 error structure. All pass standard goodness-of-fit tests and coefficients reject the zero null hypothesis at conventional significance levels.

Wald exclusion tests are presented in Figure 3 as a series of  $\chi^2$  tests mapped against the breakpoint (midpoint) of the corresponding window. Christiano (2004) finds that the critical values associated with the test statistic for this type of procedure are biased in favor of rejecting the null hypothesis of no break. This should be taken into account when comparing test statistics. The 0.05 standard critical value for the moving-window tests is 16.92. Of course, the assignment of any critical value is arbitrary. In this case, comparison against a critical value is used to suggest a lower bound level of significance. Once that is crossed, dates when breaks were most likely are identified using local peaks in the series.

We also check the robustness of the identified events in the moving-windows tests using approaches of Willard, et al. (1996), and Sussman and Yafeh (2000). First, we conduct alternative window estimations, which Willard, et al. (1996) propose as part of the procedure, that takes the windows identified by local peaks in the in the  $\chi^2$  tests and holds them constant but arbitrarily iterates the breakpoint, that is, it iterates the dummy variable  $D$  so as to test every date in the window as the possible breakpoint.<sup>23</sup> We conducted a check, similar to Sussman and Yafeh, which involves a similar iteration of the dummy extended over most or all of the dataset. We conducted the second type of check on two subperiods: 1921-1937, and 1930-1942. Both sets of alternative tests (not shown) coincide with and support the local peaks shown in the moving-window  $\chi^2$  series in Figure 3, and give particularly strong affirmation of the 1928-1929 and 1938 peaks, which we discuss below.

Finally, before examining events associated with the structural breaks identified in the analysis, we give the estimated coefficients  $\beta_1$  and  $\beta_2$  in equation (4) for each 104-week window. The results may be thought of as a series of moving-average estimate of the systematic risks for

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<sup>23</sup> To permit sufficient variation in the values of  $D$  at the two extremes, the estimation window used in this check is lengthened by 50%, or to 156 weeks, centered on the original 104-week window.

successive two-year periods. Figures 4A and 4B give series of coefficients for  $\beta_1$  and  $\beta_2$ , respectively. The dates on the horizontal axis correspond with the moving-window midpoint. As noted, our primary interest is in Figure 4B, which shows our estimates of the industry risk of each supplier area relative to the sugar industry average. The most striking pattern is the inversion of the relative estimates for  $\beta_2$  in Figure 4B for Cuba and the non-duty-paying areas, with the transition taking place between 1928 and 1931. By 1931, Cuba and Puerto Rico have changed positions – Cuba became the relatively risky supplier area, and Puerto Rico a relatively certain opportunity. U.S. domestic beet sugar meanwhile, except for a period of uncertainty in 1925-1926, is fairly steady.

Taking Figures 2, 3 and 4B together, the period from October 27, 1928 to July 13, 1929 stands out as the most prominent period in which a structural break because the test statistic is statistically significant and observation of the assets values in Cuba and Puerto Rico, in particular, show a major realignment in the relative asset valuations and perceived risks. In Figure 3, the distinctive feature giving evidence of the structural break is the prominent plateau in the series where the  $\chi^2$  values leap sharply from 9.14 in the week ending on 10/20/1928 to 25.60 in the week of 10/27/1928. It peaks on June 1, 1929, at 32.30, but never falls below 24 until after 7/13/1929, then returns to values comparable to before. It suggests a nine-month period of instability or, perhaps, confusion about what the future distribution of returns in the three supplier areas would look like down the road. The underlying two sources of uncertainty are unmistakably associated with the abandonment of crop restriction and the anticipated revision in the sugar tariff that would materialize in the schedules of the omnibus Hawley-Smoot tariff act.

The beginning of the plateau is defined by the anticipated outcome of the elections in the United States, which would be considered the major datum for predicting whether the United States would undertake a major tariff revision. Underlying this, as noted, were fears and growing demands for protection from domestic sugar producers because of the abandonment of the Cuban crop restriction in 1929 and being overwhelmed by cheap Cuban sugar. As for the U.S. elections, the major issue that divided Republicans and Democrats in those years was the tariff question. In the foregoing decades, every time the Democratic Party had gained control of Congress, they lowered tariffs; and when the Republican Party gained control, they raised tariffs.<sup>24</sup>

Cubans were hopeful of a victory by the Democratic candidate, Al Smith; but Hoover's platform of farm protectionism succeeded in attracting the critical farm vote. In the weeks leading up to the election, investors may have begun to anticipate Hoover's upcoming victory. In the same month, domestic sugar interests were sowing seeds of fear about Cuba's abandonment of crop restriction. Royal Mead, Vice-President of the Domestic Sugar Producers' Association was quoted in the press warning that "a flood" of "cheaply produced [Cuban] sugar" would mean the "ruination of the domestic sugar industry," predicting a record crop of 6 million tons – 0.8 million tons greater than the previous record crop of 1925. The Association of Hacendados of Santa Clara (a Cuban province) had tried to offer a less exaggerated prediction, but Mead accused the Santa Clara producers of trying to "anaesthetize the domestic sugar producers of the United States."<sup>25</sup>

The end of the plateau happened as the House passed its version of the Hawley-Smoot tariff bill and reported it to the Senate Committee on Finance. Prior to that date there was some

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<sup>24</sup> Bailey, Goldstein, and Weingast (1997); Goldstein (1993).

<sup>25</sup> *Facts About Sugar*, Sept. 15, 1928. A Cuban Congressman, Pastor del Rio, was quoted in October in the trade press saying that "Hoover's protectionistic plans ..., if enacted, will prove ruinous [Cuba]." *Louisiana Planter and Sugar Manufacturer*, Oct. 13, 1928.

uncertainty about whether it would approve an increase in the sugar tariff. Opponents in the House tried to prevent it, but in the end the opposition was defeated by a deal in the Republican caucus that prevented debate on the House floor using the closed rule.<sup>26</sup> The tariff on Cuban sugar in the House bill was set at 2.4 cents per lb., which was approximately equivalent to a 70% ad valorem tariff over the current price. (Prior to this, many in Cuba were saying a 2-cent tariff would be ruinous.) In the Senate Finance Committee, with Smoot as chair of the committee, it became clear fairly quickly that the interests of domestic sugar would be served. Any confusion investors may have had about the relative risks in Cuban and the non-duty-paying supplier areas was cleared up around that time.<sup>27</sup>

### *Conclusion*

The event study shows, above all, that the most critical turning point for the Cuban sugar industry as well as foreign investments in Cuban sugar was the anticipation and enactment of the 1930 increase in the sugar tariff in the United States, as part of the Hawley-Smoot tariff act. Cuban and North American participants in the market alike noted that it was the 1930 tariff that ruined them. Charles Mitchell, chairman of the National City Bank, stated that the bank viewed its sugar mills as “an excellent investment” so long as the market conditions were not unusually bad, “because these properties ... are the lowest-cost producers, or among the lowest-cost producers, on the entire island of Cuba, and Cuba in itself is the lowest-cost producer in the world.”<sup>28</sup> Cleveland and Huertas argue that bank officers in the Havana branch exposed the bank unwisely to Cuban sugar.<sup>29</sup> But if they underestimated the risks of retaining and operating those

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<sup>26</sup> Dye and Sicotte (2005b), Kaplan (1996).

<sup>27</sup> Dye and Sicotte (2005b).

<sup>28</sup> Charles Mitchell testimony, Senate Banking Committee Hearings (1933), p. 1796.

<sup>29</sup> Cleveland and Huertas (1985).

properties, the findings of this paper (including evidence presented in a longer version of the paper) show that price and cost risks had been well considered. It was the political risk that was underestimated – political risk that emanated from policy decisions of their own government.

Recent work in the political economy of empire argues that the hegemonic power tends to underpin international financial markets and enforce rogue nations to adopt sound investment practices. In this case, however, the United States chose policies that protected rent-seeking domestic sugar producers even though it resulted in the almost complete destruction of otherwise sound foreign investments. If these acts did not violate the property rights of citizens with assets abroad, they certainly did not enforce their security. If North American capitalists, powerful as they were, had been left unimpeded to reap the returns to their investments, Cuba's comparative advantage would have been maintained, and Cuba and the subsequent politics of revolution would have been played out in different economic terrain.

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**Table 1: Foreign Assets in Cuba**  
(\$US millions)

<b>Origin: US</b>	<b>1896</b>	<b>1906</b>	<b>1911</b>	<b>1927</b>	<b>1936</b>	<b>1946</b>
Agriculture		96.0	75.0	645.0	264.6	227.0
Sugar		30.0	65.0	600.0	240.0	
Other		66.0	10.0	45.0	24.6	
Public Utilities (incl. railroads & communications)		59.0	45.0	235.0	215.0	251.0
Mining and Manufacturing	15.0	6.0	25.0	65.0	27.0	40.0
Services	30.3	50.5	95.0	275.3	274.2	35.0
Government		37.0	30.0	100.0		
Other		13.5	65.0	175.3		
<b>Total</b>	<b>45.3</b>	<b>211.5</b>	<b>240.0</b>	<b>1220.3</b>	<b>781.2</b>	<b>553.0</b>
<b>Origin: UK</b>						
			<b>1913</b>	<b>1927</b>	<b>1939</b>	<b>1945</b>
Railroads			125.6	147.6	142.2	127.1
Other			90.6	75.0	12.7	6.3
<b>Total</b>			<b>216.2</b>	<b>222.6</b>	<b>154.9</b>	<b>133.4</b>

Sources: Dickens (1938), Lewis (1938), Rippy (1948), U.S. Dept. of Commerce (1956).

**Table 2: Cuban Sugar Exports and the National Economy**

Year	Sugar Exports (Thousands of short tons)			Sugar Exports (millions of 1926 dollars)			Total Exports (millions of 1926 dollars)			National Income (millions of 1926 dollars)
	United States	United Kingdom	Total	United States	United Kingdom	Total	United States	United Kingdom	Total	
1904	1212.4	0.0	1212.4	90.9	0.0	90.9	124.8	9.9	149.2	372
1909	1581.0	0.0	1581.0	117.1	0.0	117.1	161.9	7.4	184.6	444
1914	2385.8	260.5	2710.6	170.6	16.3	191.4	214.1	23.2	255.4	587
1919	3445.1	665.1	4374.3	285.8	53.4	362.4	317.4	59.5	414.6	622
1924	3714.2	490.9	4332.9	326.3	45.7	382.2	369.2	50.2	443.2	798
1929	4209.5	845.5	5400.8	169.7	32.0	214.9	219.0	35.9	285.8	599
1930	2488.5	773.7	3557.9	85.6	25.7	121.7	134.3	29.5	193.6	598
1931	2321.4	563.4	2972.6	85.7	18.6	107.6	122.0	22.7	162.8	537
1932	1870.1	720.4	2864.8	60.1	17.0	83.3	88.8	19.2	124.6	437
1933	1530.3	746.7	2501.8	59.4	21.5	87.8	86.6	24.8	128.0	446
1934	1736.9	534.9	2518.0	76.7	14.9	98.2	108.3	19.4	143.9	486
1939	2163.7	509.7	2997.9	106.8	16.4	137.3	144.2	23.3	191.6	633

Source: Cuba, Ministerio de Hacienda, *Anuario Azucarero de Cuba* (1959), Zanetti (1989), Alienes Urosa (1950).

**Table 3: Nationality of Ownership and Industrial Concentration in the Cuban Sugar Industry**  
(percent)

	Four-firm concentration ratio <sup>a</sup>	Owned by North Americans <sup>b</sup>	Owned by North-American Banks <sup>c</sup>	Owned by North American Refiners <sup>d</sup>
1909	7.0	--	--	--
1914	11.2	38.3	0.0	0.0
1919	25.4	49.8	0.5	0.5
1924	35.3	64.5	6.8	5.2
1929	49.0	66.9	11.6	5.0
1934	39.6	68.4	12.1	5.4
1939	39.3	62.2	10.2	6.4

Sources: To determine the ownership and nationality of sugar mills from Cuban official sources is less than straightforward. The lists usually used are incomplete and contain many discrepancies. The authors have compiled information to determine ownership from a wide array of sources including: Cuba, Secretaría de Hacienda, *La industria azucarera y sus derivados* (1910, 1914); Pino-Santos (1973), pp. 45-47; Cuba, Secretaría de Agricultura, *Memoria de la zafra* (1916-1929), *Memoria azucarera* (1930-1939), Farr & Co. (1922-1942), Santamaria (2001), McDowall (1993), Jiménez (2000), García Álvarez (1990), McAvoy (2003), USNA Record Group 59 Serial no. 837.61351/924 1/18/1935, and *the Louisiana Planter and Sugar Manufacturer* passim.

<sup>a</sup> The four-firm concentration ratio for 1914 includes the Gómez Mena mills, which were Cuban-owned, and the Rionda mills, which were owned by a family with roots in both Cuba and the United States. The Rionda mills are included among the top four firms in later years, but not the Gómez Mena mills.

<sup>b</sup> North American ownership includes mills owned by citizens of or companies based in the United States or Canada. It also includes mills owned by companies that are "transnational," that is, the owners are members of a family that have roots in both the United States or Cuba. It is the convention in the literature to include them as "American" mills.

<sup>c</sup> Bank-owned mills include all sugar properties owned by General Sugars Corporation, which was the operating subsidiary, wholly owned by National City Bank; the Sugar Plantations Operating Co., which was the operating subsidiary of the Royal Bank of Canada; The First National Bank of Boston; and Chase National Bank.

<sup>d</sup> Refiner-owned mills include only mills owned as subsidiaries whose core business was sugar refining. These include: the American Sugar Refining Co., the National Sugar Refining Co., and Warner Refining Co. The following are not included in the refiner-owned percent given here: the Cuban-American Sugar Co. owned a small refinery in Louisiana; the Rionda family acquired the McCahan refinery; but their chief business was raw sugar production. In both cases, the refining capacity they owned was small relative to their raw sugar producing capacity. Also, the Hershey Corporation owned a refinery, located in Cuba, also is not included in the refiner-owned figures in the table. For alternative views on the refiner and bank-owned properties, see Rowe (1930), Pino-Santos (1973), and Ayala (1999).

**Table 4: Sources of Supply to the U.S. Sugar Market**

	<b>Volume</b> (000s short tons)						
	US Mainland Beet	Mainland Cane	Hawaii	Puerto Rico	Philippines	Cuba	Total
1904	259	415	368	130	31	1410	3023
1909	348	332	511	244	42	1431	3530
1914	773	247	557	321	58	2463	4431
1919	777	122	579	364	88	3343	5352
1924	1166	90	677	393	339	3692	6463
1929	1089	218	882	507	711	4149	7587
1934	1562	268	948	807	1088	1866	6574
1939	1809	587	966	1126	980	1930	7466
	<b>Value</b> (\$US of 1926 millions)						
	US Mainland Beet	Mainland Cane	Hawaii	Puerto Rico	Philippines	Cuba	Total
1904	34.5	55.3	49.0	17.3	2.8	124.1	314.4
1909	41.1	39.2	60.4	28.8	3.4	112.1	327.6
1914	92.9	29.7	66.9	38.6	7.0	198.4	434.3
1919	82.5	13.0	61.5	38.7	9.3	306.5	518.6
1924	141.4	10.9	82.1	47.7	41.1	315.0	646.5
1929	86.0	17.2	69.7	40.1	56.2	174.2	444.5
1934	128.0	22.0	77.7	66.1	89.2	73.2	457.4
1939	134.5	43.7	71.8	83.7	72.9	98.5	508.4

Source: U.S. Congress, Committee on Agriculture (1962).

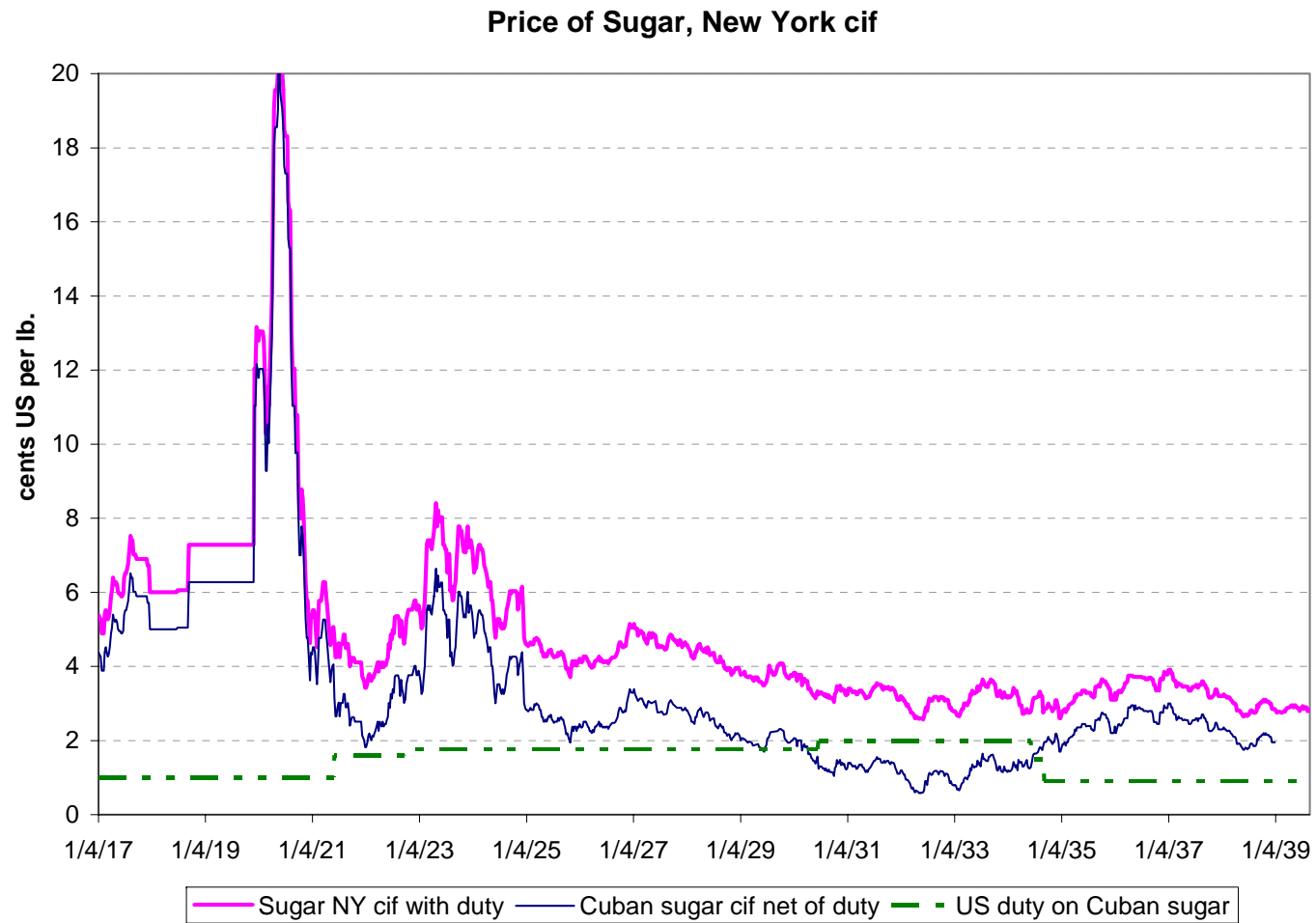
<sup>a</sup> Values are estimated using the product of volumes and the average annual price of sugar, net of duty for Cuba. Figures are deflated using the U.S. BLI Wholesale Price Index.

**Table 5: Local Maxima in the Moving-Windows Tests for Exclusion of Structural Breaks**

<b>Rank order of local chi-squared peaks</b>	<b>Dates of plateau</b>	<b>Range of chi-squared values in plateau</b>	<b>Peak</b>	<b>Event(s)</b>
1	01/22/1938 – 02/05/1938	40.53, 41.87	02/05/1938	Anticipation of World War II
2	10/27/1928 – 07/13/1929	24.22, 32.30	06/01/1929	U.S. Tariff Increase
3	01/09/1937 – 02/06/1937	20.52, 28.75	02/06/1937	U.S., Cuban and World Sugar Politics
4	06/24/1939 – 11/18/1939	20.07, 25.81	08/19/1939	Imminence of World War II
5	01/09/1926 – 07/17/1926	7.15, 21.21	01/09/1926	First Cuban Restriction
6	07/26/1930 – 10/11/1930	15.36, 19.97	10/11/1930	Chadbourne Five-Year Plan of Cuban Restrictions
7	01/12/1935 – 08/03/1935	10.48, 18.95	07/13/1935	Uncertainty over Legality of U.S. Quota Program

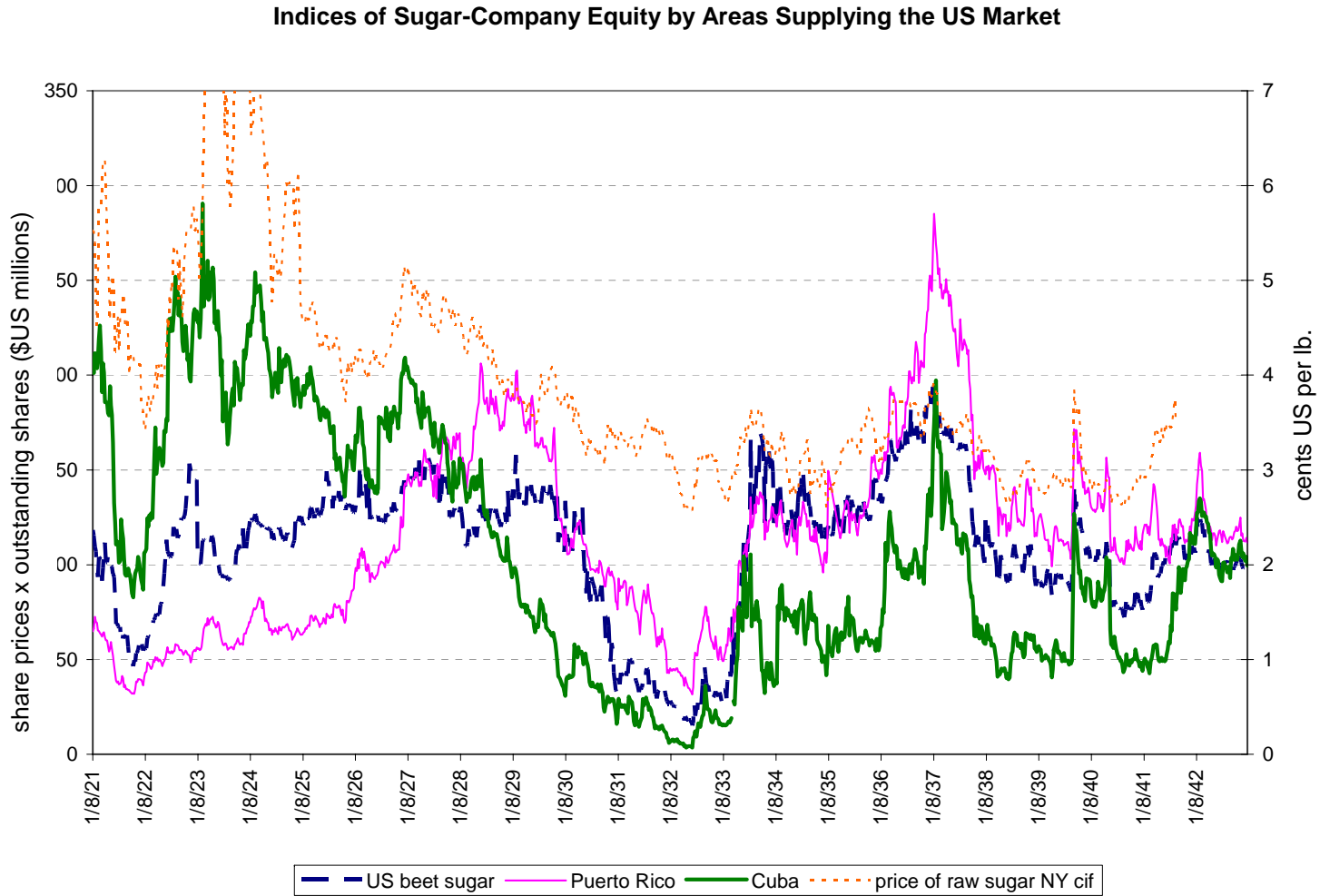
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Figure 1: Sugar Prices, cif New York

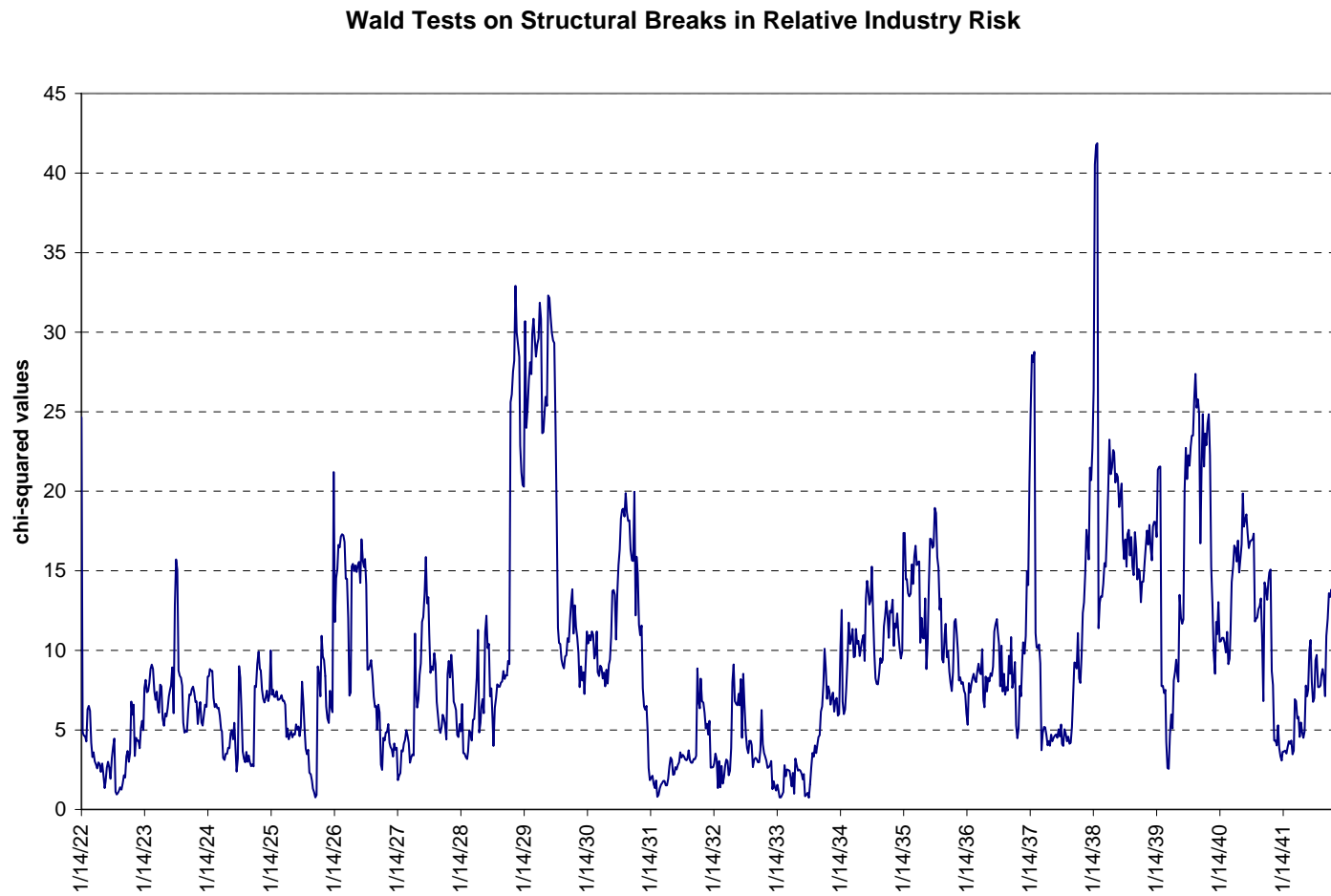


Source: *Journal of Commerce, Willett & Gray*

Figure 2: Sugar-Company Equity Indices

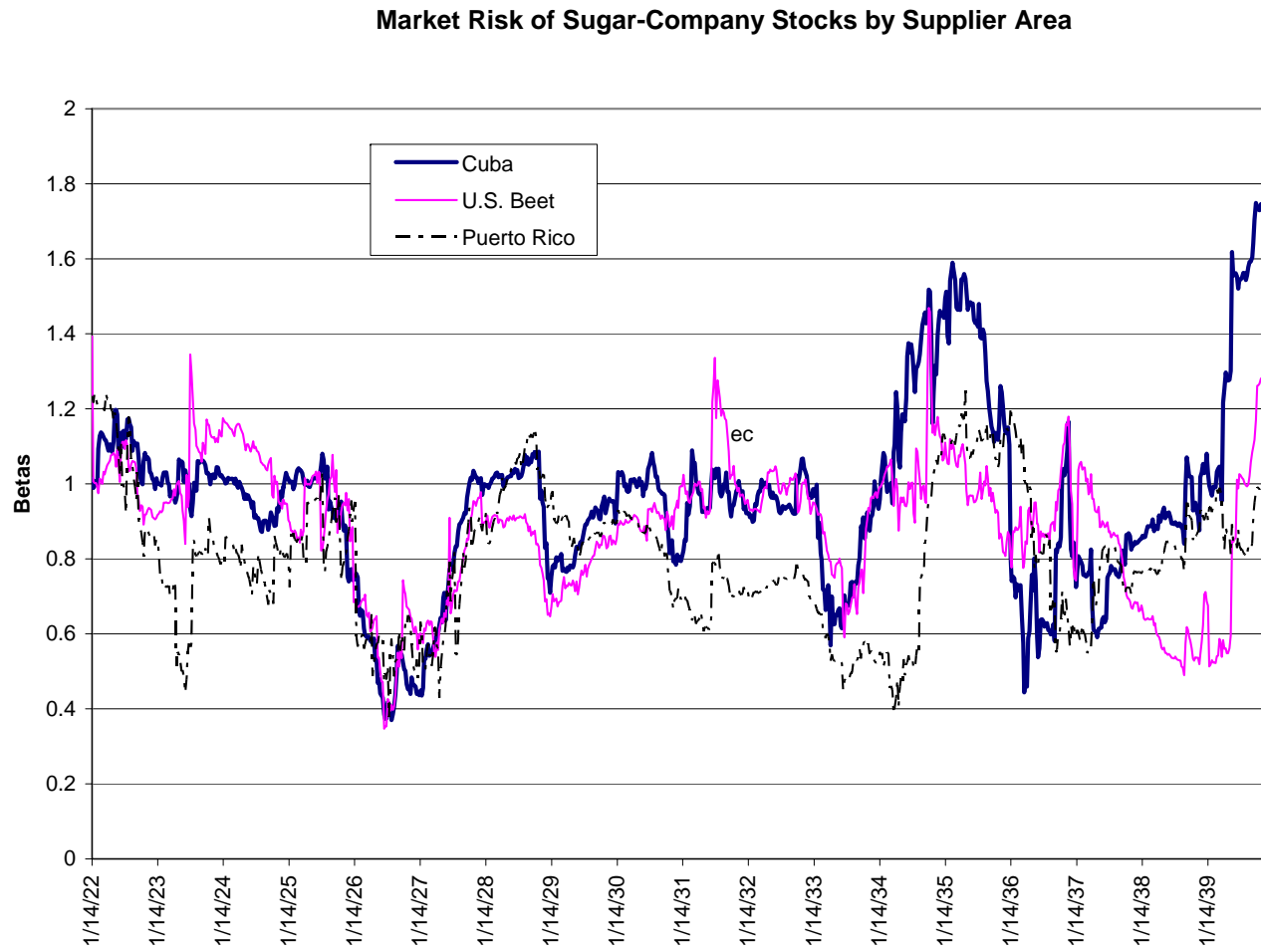


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**Figure 3: Moving-Window Exclusion Tests on Structural Breaks**

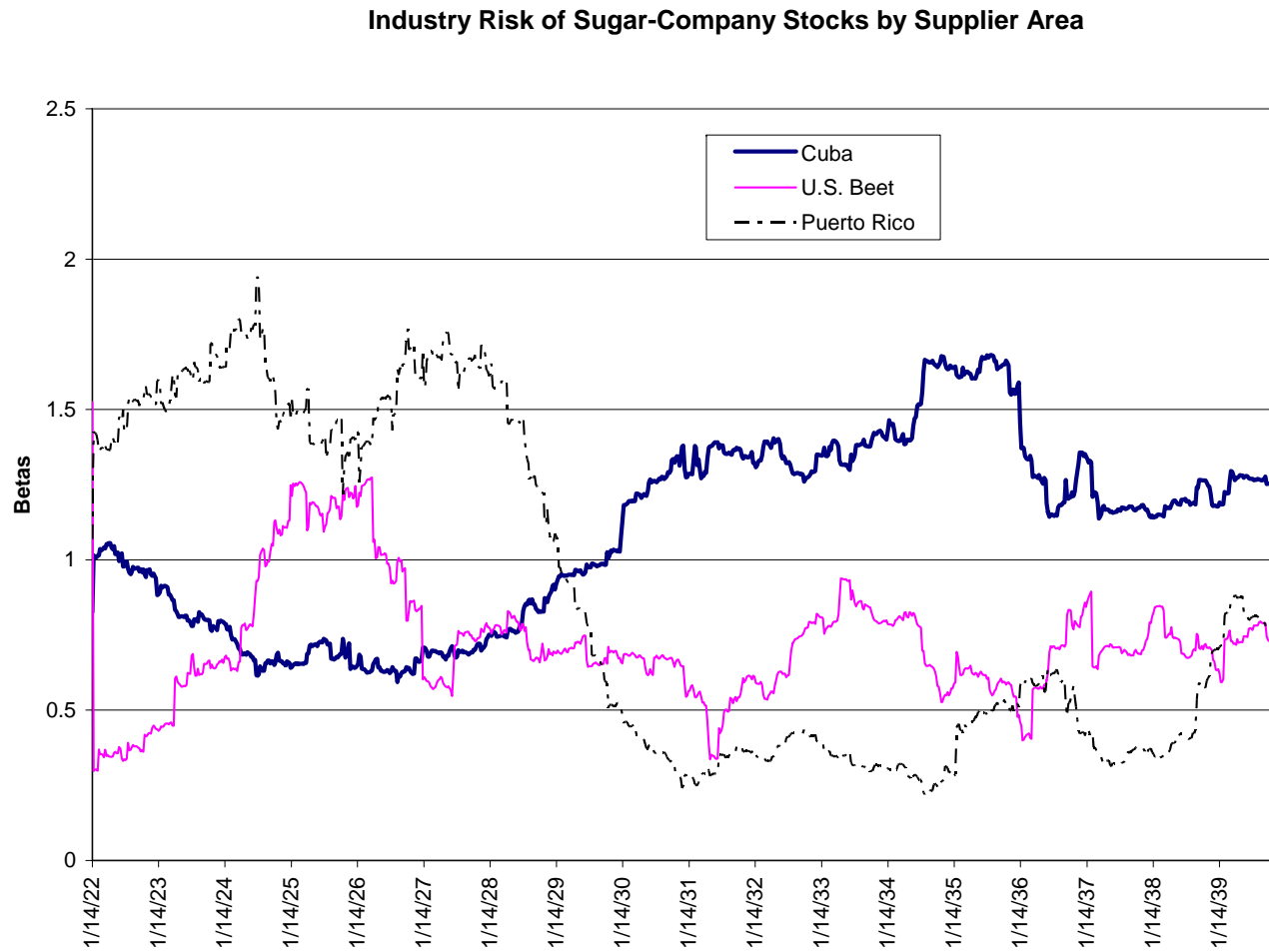
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Figure 4A: Market Risk of Sugar-Company Stocks by Supplier Area



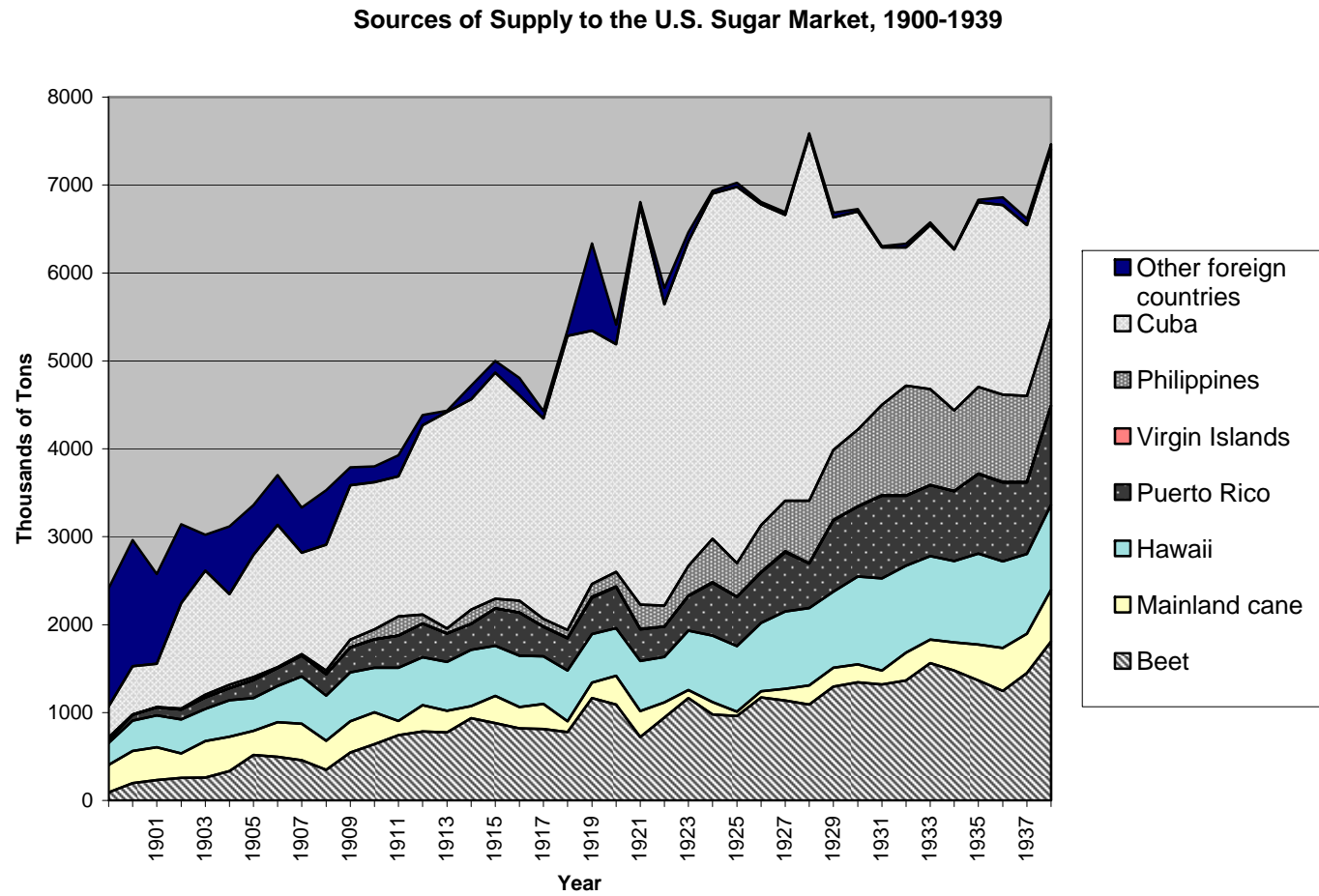
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Figure 4B: Industry Risk of Sugar-Company Stocks by Supplier Area



Source: see text

Figure 5: Sources of Supply to the U.S. Sugar Market



Source: U.S. House of Representatives, Committee on Agriculture (1962).

