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3 The Sugar Institute Learns to Organize Information Exchange

David Genesove and Wallace P. Mullin

3.1 Introduction

One of the central tasks of a trade association is to facilitate the exchange of information among firms. Such information may involve production and sale data, or more direct information on demand conditions. Although this function has attracted some attention in the economic literature, the models treat the trade association as a “black box” that neutrally transmits verifiable information that has been submitted by the firms. In practice, a workable information-exchange agreement involves critical, concrete choices of institutional design. We consider the difficulties involved in constructing and carrying out such agreements by examining the case of the Sugar Institute, the trade association of U.S. cane sugar refiners from 1928 to 1936.

A trade association is a peculiar type of “governance structure,” to use Oliver Williamson’s phrase, that lies on the border between the market and the firm. While member firms cooperate in certain dimensions, they retain independence over both pricing and production decisions and internal information and accounting systems. This division of authority inevitably gives rise to a conflict between the *collective* interest of firms to share information and the *individual* interest of each firm to withhold it. For example, if firms are colluding on

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prices, then there is a collective interest in having information available to monitor and maintain collusion. But it remains in the individual firm's interest to undercut the collusive price and cheat if it can do so undetected. This tension animated the Sugar Institute in both its design and implementation, and, shortly after its formation, threatened to render impotent if not destroy the institute. Nevertheless, the members of the institute, operating through its established framework, were gradually able to exchange information cooperatively and to modify, with mixed success, industry practices.

The organization and operation of a trade association therefore involves incentive problems that are muted if not absent when information is internal to the firm.¹ First, firms must be induced to join. If nonparticipation is too attractive, the association will unravel. Second, member firms must give truthful reports of their information. A firm could violate the information-sharing agreement either by nonreporting (failing to file a report), or misreporting (filing a false report). Lacking the coercive powers of a firm over its divisions, a trade association must find other ways to induce the desired behavior of its constituent firms. Finally, the association must protect the confidentiality of any reported information not intended to be shared. These incentive problems are difficult enough when firms are identical; they become more severe when firms are heterogeneous, because that sharpens the divergence between the firms' collective and individual interests.

The Sugar Institute was organized in a period of decreased demand for sugar and substantial excess refining capacity. Similar circumstances fifty years earlier had led to the consolidation of the industry, an option foreclosed in the intervening years by the emergence of antitrust policy. Instead, the refiners chose to form a trade association, a type of industrial cooperation then in its heyday. As a substitute for a merger, a trade association is clearly inferior. Indeed, throughout the life of the institute there were continual, though vague and ineffectual, calls for real consolidations among the refiners to produce a tighter oligopoly. Nevertheless, the institute did succeed in raising price, and within a year had doubled the Lerner price index. But it soon ran afoul of the antitrust laws. The Department of Justice filed suit in March 1931. The District Court for the Southern District of New York ruled against the Sugar Institute in 1934, and the Supreme Court concurred in 1936.²

Information exchange served two roles for the Sugar Institute. The institute's primary objective was collusion, and information exchange helped enforce the institute's rules. The Sugar Institute never fixed prices or set either production quotas or market shares. Its methods were more indirect. Through its Code of

1. There are of course important incentive problems in managing information inside firms. For example, if the performance of a division will affect the compensation of its managers, then the general office may face problems in eliciting indications of poor performance. But the general office still retains greater authority over information systems and greater auditing ability than a trade association would possess over member firms.

2. *United States v. Sugar Institute*, 15 Fed. Sup. 817 (1934), 297 U.S. 553 (1936).

Ethics, it promulgated and enforced rules of trade whose purpose was to make price cuts more transparent, and so detectable, as we discuss in a companion paper (Genesove and Mullin 1997a). First among those rules was “open pricing”—the requirement that firms offer no secret price discounts. Other rules standardized contractual terms.

Some means of ensuring adherence to these rules was needed. The direct monitoring of compliance through private investigation and auditing downstream firms’ records and refiners’ stocks was one route taken. Another was information exchange. For example, refiners submitted production and delivery figures, and, for a time, sales figures, which the institute staff aggregated. A firm could use these aggregate figures to monitor its share of industry demand, and so infer secret price cutting if its market share fell.

But information exchange was also an end in itself. Several refiners testified at trial that the prospects of obtaining credible industry statistical information played an important role in their decision to join the institute, and the private correspondence of the vice president of one firm shows his use of institute data to benchmark his own firm’s performance. The institute undertook other collective actions, such as an industry-wide advertising campaign, and standardization of sugar grades. However, such activities were secondary, and when the Supreme Court ruled against the Sugar Institute’s primary actions, its members chose to dissolve it.

The broader historical context for the Sugar Institute is found in the changing political and legal environment of the 1920s and 1930s, which saw the rise and fall of trade associations, information-exchange agreements, and “open price associations.” With an initial impetus provided by Arthur Jerome Eddy’s 1912 book *The New Competition*, 150 open price associations were operating by 1921.³

From 1921 to 1928 Secretary of Commerce Herbert Hoover played a pivotal role in promoting a variety of cooperative, associational activities, including industry trade associations. As documented by Hawley (1974, 1981), Hoover promoted trade associations both directly, through the Department of Commerce’s expanded jurisdiction, and indirectly, by influencing and persuading other government entities to look favorably upon such organizations.

The greatest threat to these trade associations was posed by antitrust law. Two Supreme Court decisions in 1921 and 1923 outlawed the information-exchange activities of the hardwood-lumber and linseed-oil industries, and this threatened to curtail significantly the number and activities of trade associations.⁴ In *American Column and Lumber Co.*, the Supreme Court found illegal an information-exchange agreement in which members were required to submit weekly the details of individual sale transactions, including the price and

3. Federal Trade Commission Survey, cited in Whitney 1935, 40.

4. *American Column and Lumber Co. et al. v. United States*, 257 U.S. 377 (1921); *United States v. American Linseed Oil Co. et al.*, 262 U.S. 371 (1923).

buyer for each sale, which the trade association then reported in full to all its members.

In 1922 the Commerce Department countered this ruling by substituting its own activities for those outlawed for trade associations. It collected more data about individual industries than before, and for a period essentially acted as a clearinghouse for data provided by private trade associations. Since under both sets of arrangements the statistics were at least nominally collected by Commerce, compliant firms could not be prosecuted for an antitrust violation. Hoover also tried to convince the Department of Justice to accept the legality of trade associations that engaged solely in the exchange of statistics. Attorney General Harry M. Daugherty was resistant to this suggestion, but his departure in 1924 paved the way for successors more sympathetic to Hoover's viewpoint (Hawley 1974, 126, 136; Galambos 1966, 93).

Moreover, the Supreme Court soon adopted a friendlier attitude. The *Maple Flooring* and *Cement Manufacturers* cases of June 1925, while not directly overturning *American Column and Lumber Co.*, did significantly narrow the scope of that earlier case's prohibitions.⁵ There were some important differences of fact that distinguished these latter cases from the earlier precedent. In *Maple Flooring*, for example, individual members' reports to the trade association on quantity sold, production costs, past prices received, and inventory were first summarized or masked before being distributed to other members. Also, the summary statistics were disseminated to the trade generally, and were not limited to the members, as in the earlier case. But the Supreme Court's more favorable treatment certainly reflected a changed economic and political sentiment. The Court itself acknowledged in *Maple Flooring*, "It is the consensus of opinion of economists and many of the most important agencies of Government that the public interest is served by the gathering and dissemination, in the widest possible manner, of information with respect to the production and distribution, cost and prices in actual sales, of market commodities, because the making available of such information tends to stabilize trade and industry, to produce fairer price levels and to avoid waste which inevitably attends the unintelligent conduct of economic enterprise" (582–83).

So by the time the U.S. cane sugar refiners met in 1927 to establish their trade association, they had reason to expect a generally friendly reception from the legal authorities.

Our study of the Sugar Institute complements other contributions to this conference volume. We conceive of three objects of firm learning: technology, production techniques, and organizations and incentives. Usselman (chap. 2) and Lamoreaux and Sokoloff (chap. 1) have examined learning about both technique and technology. Mishina (chap. 4) documents how knowledge about a production process was created and implemented. In contrast, we study a technologically stagnant industry. The sugar refining industry did not introduce

5. *Maple Flooring Manufacturers' Association et al. v. United States*, 268 U.S. 563 (1925); *Cement Manufacturers' Protective Association et al. v. United States*, 268 U.S. 588 (1925).

new production technologies in the decades surrounding the formation of the Sugar Trust.⁶ Sugar-industry members did learn during the period of the Sugar Institute, but it was learning about extrafirm organizational design and the management of incentives. Organizational innovation and its application is as noteworthy as the introduction of new technologies and techniques. Charles and Frank Duryea built and operated the first automobile in the United States, Henry Ford introduced mass production, but it is Alfred Sloan whom Chandler (1962) and Williamson (1975) celebrate for successfully addressing General Motors' incentive problems through the multidivisional or M-form organizational design.

Much of our information about the internal workings of the Sugar Institute comes from the papers of Louis V. Placé, Jr., vice president of McCahan Sugar Refining, and that firm's representative as a director of the Sugar Institute. He prepared notes on meetings of the Sugar Institute's Executive Committee, board of directors, and Enforcement Committee, and these notes are available from January 1929 to July 1930.⁷ They were prepared to circulate only within a circle of about six McCahan executives, so they represent a fairly candid account of the institute's motivations and activities. Placé offered strong views to his McCahan colleagues as to how the institute should operate, so he was far from a disinterested observer. We also have some correspondence to and from Placé.⁸ We also use testimony from the trial record.

We highlight our findings as we foreshadow the organization of this paper. In section 3.2 we discuss more fully the incentive issues involved in organizing and maintaining a trade association. Section 3.3 addresses the Sugar Institute's formation and early development.

Section 3.4 is the core of this chapter. It discusses how the institute learned and evolved as it attempted to effect firm information exchange. The organizational design of the Sugar Institute was fairly decentralized yet created a structure for collective decision making. There were disagreements among the firms over what information should be shared. Production and delivery statistics

6. A 1945 sugar handbook's list of the apparatus used in cane sugar manufacturing contains nothing introduced beyond the nineteenth century (Spencer and Meade 1945, 72), and Yano (1982, 54) states, "It is generally agreed that the basic technologies in sugar refining were evolved in the late 19th century and no major innovations have occurred since then." Most telling is that the amount of raw sugar (whose standard grade was 96 percent pure sugar, or sucrose, and 4 percent water and impurities) required to produce 100 pounds of refined sugar (which is 100 percent sucrose) remained unchanged for decades. Because there is some loss of sucrose in the refining process, 100 pounds of raw sugar will produce less than 96 pounds of refined sugar. To produce 100 pounds of refined sugar took between 107 and 107.5 pounds of raw at the turn of the century (U.S. Industrial Commission 1900, vol. 1, part 2), 107 pounds of raw in the Sugar Institute period (U.S. Tariff Commission 1934, 109), and still 107 pounds by 1971 (Robert R. Nathan Associates 1971, 5).

7. The bibliographic citation is Placé, W. J. McCahan Sugar Refining and Molasses Company, box 11, Sugar Institute, memoranda and notes of meetings. We will cite these records herein as Placé Memoranda. A few stray memoranda up through June 1931 are also included.

8. The bibliographic citation is Placé Records, W. J. McCahan Sugar Refining and Molasses Company, box 1, M. E. Rionda Correspondence, boxes 2-3, General Correspondence. We will cite these records herein as Placé Correspondence.

were circulated with minimal difficulty, but sales statistics were shared for only a short period. The largest firms were the least willing to share information, particularly sales information. Heterogeneity among firms, of which the two salient characteristics were size and location, also played a critical role in determining membership in the institute. Some divergent interests were reconciled within the structure of the institute, while others remained outside.

Section 3.5 compares the institute to the sugar refiners' proposed code under the Agricultural Adjustment Act of 1933. Comparing the two codes reveals what lessons about organizing information exchange the industry assimilated. Section 3.6 concludes by showing how one firm used the information provided by the institute, and evaluates the overall success of the institute.

3.2 Incentive Issues in Information-Exchange Agreements

Collusive agreements are constantly in danger of being undermined by secret price cuts. Since a collusive agreement results in a price above marginal cost, participant firms have an individual incentive to undercut this price slightly and receive a larger share of industry demand and profits. A firm cheating on the collusive arrangement in this way will want to do so secretly in order to avoid retaliation from other producers.⁹ Anything that makes detection of a secret price cut more likely therefore serves to enhance collusion. The Sugar Institute's Code of Ethics had as its first requirement that "sugar should be sold only upon open prices and terms publicly announced." Adherence to this requirement and the truthful provision of prices and production levels would clearly make cheating more evident.

Although we find this collusion explanation for the Sugar Institute the most compelling, we do not dismiss the possibility that efficiency concerns may have also played a role in the institute's information exchange. A number of theoretical papers have shown that there are nonstrategic incentives for firms to agree to information exchange. If each firm receives only a noisy signal of aggregate market demand, then exchanging signals will result in a more precise signal for all participants, allowing them to make better-informed production and inventory decisions, thereby reducing expected production costs. Information sharing also increases the correlation of firm strategies, precisely because this allows firms to base their decisions on commonly shared information. The combination of these effects can be both privately and socially beneficial as illustrated by Kirby (1988).

The collusion and efficiency explanations should not be viewed as mutually exclusive, however. It is possible that the exchange of production information both supported collusion and generated more precise demand information and hence more efficient planning by firms. Also, the promise of information exchange may have induced firms to join the collusive undertaking who would

9. This idea was first expressed by Stigler (1964). Its most successful formalization is Green and Porter's (1984).

have otherwise free ridden on it. In any case, ascertaining the ultimate aims of the Sugar Institute is not our primary focus here, since the problems of institutional design and evolution are present regardless of the ultimate aim.

A potentially very serious problem is that parties to an information-exchange agreement, whatever its purpose, may wish to misreport their price or production information. That is obviously true when the goal is to prevent price cutting, but it is also true if the parties are brought together by other goals. In the language of mechanism design, the trade association faces a problem of “incentive compatibility.” More colloquially, it is a problem of “truth telling”—will firms be willing to report their true information, given the auditing and sanctioning technology at the disposal of the trade association?

There are two ways in which a firm might violate an information-sharing arrangement. First, it might simply refuse to report its information. Enforcement against this violation requires some sanction for nonreporting. Second, the firm might misreport its information. Enforcement against this requires not only sanction but also detection of the violation, creating a need for auditing or monitoring of firm activity and/or records.

Surprisingly, and with the exception of reports on undelivered contracts, which we discuss later, there is no indication of misreporting of *statistics* by institute members. There are several reasons why firms might not misreport. Individuals may be averse to lying for ethical or moral reasons, and thus make a distinction between the refusal to file a report and falsifying one. Also, it may be important for individuals and firms to develop a reputation for truth telling, both in their dealings inside the institute and outside it. Of course, this reputation is jeopardized only if there's a chance that the truth will out. But that was a risk in this environment, since there were other sources of information, such as brokers, customers, and the observations of purchases of raw sugar, the key input. These other sources did not enable outsiders to observe the firm's private information perfectly, but they may have allowed a sufficiently accurate assessment to deter lying. The possibility of an *ex post* audit by the institute (although none was ever conducted) would have been a further deterrent. In sum, it may be too difficult to construct a credible, systematic lie, since a variety of bits of information, both internal and external to the firm, have to be made consistent with any false report.

Another enforcement problem is how to exclude nonparticipants or violators from receiving the shared information. If all participants in the agreement receive the same information from the institute, then there may be an incentive for a nonparticipant to purchase the information from a cooperative participant. This in turn would affect the incentives for participation, and in the extreme case the entire agreement would unravel. Vives (1990) addresses this issue in a setting in which no single firm is large enough to influence aggregate market outcomes, an assumption not matched in the sugar refining industry. Nevertheless his results are instructive. Under an exclusionary disclosure rule, in which only members receive shared information, information sharing is an equilibrium, provided that the costs of joining the trade association are not too

high. Under a nonexclusionary disclosure, in which the information is made available to nonmembers and the public as well, the free-rider problem prevents information sharing from being an equilibrium.

A more subtle issue is how to ensure credibly the *nonsharing* of information. The Sugar Institute aggregated the individual member statistical reports before distributing that aggregate information to the members and/or the trade. The central office of the Sugar Institute was more than a simple adding machine, since it had to assure members that their individual reports would not be shared with anyone else. A firm might be willing to submit its information to a central organization yet not want to share that individual information with its competitors. Failure to preserve the confidentiality of this private information could destroy the information-exchange agreement. Paradoxically, tight controls on the sharing of information could create more equilibrium sharing of information.¹⁰

3.3 Formation of the Sugar Institute

3.3.1 Environment and Origins

The U.S. cane sugar refiners faced serious difficulties in 1927. The combination of the revival of European beet sugar production after the war, worldwide government subsidization of beet production, and a new “slimness craze” had left the industry with substantial excess capacity. Although the industry was still relatively concentrated, with the three largest firms responsible for almost 60 percent of production, this was a far cry from the prewar years, in which a single firm had dominated the production of this homogeneous good. The result was fierce competition by way of secret price cuts and other concessions to selected customers, and so falling profit margins.

To a sugar man with a long enough memory, these conditions must have recalled the situation in the 1880s, when excess capacity was even greater and price wars prevailed. Then the solution was a grand merger of firms. This first took the form of the Sugar Trust, a combination of eighteen independent firms representing 80 percent of industry capacity. When in 1891 that form was no longer legally available, the Sugar Trust became the American Sugar Refining Company (ASRC).

10. The models of information sharing suggest that the crucial issue is the nature of the private information. Information could be private-valued (like the idiosyncratic costs of an individual firm), common-valued (like an individual-firm signal of industry demand), or some combination of the two. If information is completely common-valued, no firm would be willing to pay for the report of any individual firm, nor would any individual firm care about such a disclosure. With common-valued information, the aggregate report contains the only useful information; the aggregate statistic is a sufficient statistic. In the presence of private-valued information, however, there could be concerns about unauthorized disclosure.

Creane (1998) categorizes the previous literature on information sharing and advances a framework for establishing more general results.

Consolidation was the industry's continual response to similar problems throughout its early history. Over the next twenty years or so, ASRC's strategy for dealing with entry was to acquire entrants, at times after a fierce price war. The long-run success of that strategy is subject to dispute—contrast Zerbe's Chicago school skepticism (1969) of its viability with Eichner's account (1969), or consult Genesove and Mullin (1997b) for an intermediate viewpoint—but the repeated attempts to repeat the success of 1887 are evident.

In part because the buyout attempts were not completely successful, in part because of the loss of ASRC's founder, Henry Havemeyer, in 1907, and in part due to restrictions imposed by the Department of Justice's 1910 monopolization suit, ASRC shrank in size. Its market share had peaked at 91 percent in 1892, and it declined to 43 percent in 1914 (*Weekly Statistical Sugar Trade Journal*). The impact of this decline on competition, however, was masked by the government controls implemented for the war and the immediate postwar period.

By 1927 there were fifteen firms in the industry. Most were located along the Atlantic seaboard, especially between Boston and Baltimore, and refined Cuban raw (cane) sugar, although there were a few small refiners in Louisiana and Texas that refined domestic cane, and two large ones on the West Coast that refined Hawaiian raw sugar. ASRC was still the largest firm, but with only a 25 percent market share (and a quarter ownership of the next largest firm, National). As table 3.1 shows, ASRC and National were the only multiplant firms, and ASRC the only one to have plants in more than one city. The cane sugar refining industry accounted for 82.5 percent of U.S. sugar consumption. Domestic beet sugar production, concentrated in the Midwest and California, was responsible for most of the remainder (14.4 percent). A small quantity of sugar was refined "offshore," in the cane-producing islands, and imported into the United States (2.8 percent).¹¹

The solution of 1887 was unavailable in 1927. The interpretation and enforcement of the Sherman Act, and its particular application to the sugar industry in the 1910 monopolization suit, had seen to that. Instead, the refiners formed a trade association, the Sugar Institute. Although preliminary discussions about forming a sugar trade association had taken place as early as 1925, significant progress was not made until a June 1927 conferral between the attorney Wilbur Cummings and the presidents of five refineries—Foster of ASRC, Lowry of Pennsylvania Sugar, Post of National, Rionda of McCahan, and Spreckels of Federal Sugar.¹² After a second meeting, Cummings con-

11. The figures are from United States Temporary National Economic Committee 1941, 112.

12. Transcript of Record. *The Sugar Institute, Inc., v. the United States*, Supreme Court of the United States, October term, 1935, 2:603–4. Although this document was prepared for the appeal to the Supreme Court, it is the transcript of the district court record. This is a condensed version of the verbatim testimony from the district court trial. Such narrative statements of evidence are produced by turning a series of questions and answers into a statement by the witness. The Transcript of Record documents can be found in the National Archives as part of the *district court* record: *United States v. Sugar Institute*, box 504274A, henceforth cited as District Court Record.

Table 3.1 U.S. Cane Sugar Refiners

Firm	Market Share in 1927	Location of Plant(s)
American Sugar Refining Co.	25.06	5 plants: Boston, New York, Philadelphia, Baltimore, New Orleans
National Sugar Refining Co.	22.07	3 plants: New York City area
California & Hawaiian	10.84	Crockett, CA
Pennsylvania Sugar Co.	6.73	Philadelphia
Arbuckle Brothers	5.80	Brooklyn, NY
Western Sugar Refinery	4.46	San Francisco
Godchaux Sugars, Inc.	4.02	Reserve, LA
W. J. McCahan Sugar Refining & Molasses Co.	3.60	Philadelphia
Savannah Sugar Refining Corp.	3.26	Savannah
Revere Sugar Refinery	3.20	Charlestown, MA
Imperial Sugar Co.	3.00	Sugar Lands, TX
Federal Sugar Refining (Spreckels Sugar) Co.*	2.66	Yonkers, NY
Colonial Sugars Co.	2.33	Gramercy, LA
Texas Sugar Refining Corp.	1.84	Texas City, TX
William Henderson	1.13	New Orleans

Sources: United States Temporary National Economic Committee 1941, 112. Plant locations from Palmer 1927, C-33.

*Federal Sugar Refining entered receivership and was reorganized as the Spreckels Sugar Company in 1929. The Spreckels company was liquidated in 1930.

ferred with officials of Secretary Hoover's Commerce Department, the Department of Justice, and the Federal Trade Commission (FTC) about the proposed trade association and its activities. By then, the political and legal environment had become conducive to the formation of trade associations and industry codes of ethics. William Donovan, who had become the head of the Antitrust Division of the Department of Justice, was willing to guide firms seeking to form trade associations that would remain within the law (Hawley 1974, 136). Donovan indicated that he had no objection to the proposed association, although he warned that such a statement did not foreclose the possibility of future prosecution. With this tentative approval in place, the five organizing refiners or "Institute Founders" suggested that Cummings write each of the other U.S. cane sugar refiners, outlining a proposed sugar trade association and inviting them to comment on the proposal and to participate in the organization of this association.¹³

This invitation, in turn, led to a meeting of all the U.S. cane sugar refiners in New York City over 12–16 December 1927. Although a representative from the firm California and Hawaiian (C&H) attended this meeting, that firm had

13. Transcript of Record, 2:606–8, District Court Record, box 504274A. Cummings's 2 September 1927 letter of invitation is in the correspondence files of Manuel Rionda y Polledo (Rionda y Polledo, Papers and Financial Records, subject file W. Cummings, 1921–43).

already indicated its intention to remain outside the association.¹⁴ The result of this meeting was crystallized in a proposed industry Code of Ethics, which was slightly modified after a further consultation with the attorney general's office. The institute's bylaws and Code of Ethics were adopted at a meeting of member refiners 7 January 1928.¹⁵ Of the fifteen U.S. cane sugar refiners, all but C&H joined in forming the institute.¹⁶

3.3.2 Goals and Structure

Although the industry Code of Ethics (see appendix) was detailed, its first and underlying principle was that “[a]ll discriminations between customers should be abolished,” and open prices and publicly announced terms should therefore prevail. For example, the code prohibited quantity discounts to customers, so that a large customer such as Kroger or Coca-Cola would have to pay the same price as a small local grocer. It directly forbade special allowances for customers via rebates or transportation charges.

The code also discouraged practices that, while not discriminatory on their face, created the opportunity for secret concessions. For example, the code required that brokers selling refined sugar not be affiliated with any warehouses that stored sugar, nor any buyer be affiliated with a public, commercial warehouse that stored sugar. Combining these activities in the hands of a single party gave too large a scope for discrimination between buyers, as a broker could give a price concession to a buyer by not charging for storage services rendered.

The institute attempted to limit sales contracts to thirty days as another mechanism to ensure contractual uniformity and thereby avoid discrimination. Refined sugar was sold, both before and after the institute, on a system of price “moves.” Any price increase would become effective the day after it was announced, enabling customers to make purchases at the previous, lower price. Customers would not have to take delivery immediately, but could spread out withdrawals (deliveries) against these contracts over thirty or more days. For the thirty-day limit to be effective under the institute, refiners had to “enforce” their contracts, forcing customers to take delivery.

Information exchange was an express aim of the institute's articles of incorporation.¹⁷ Moreover, testimony at trial suggests that the prospects of obtaining

14. Transcript of Record, 2:608, District Court Record, box 504274A.

15. *Ibid.*, 611.

16. This counts Western Sugar Refinery as an original member, although that classification is uncertain. Frank Sullivan of Western testified that his company did not initially join the institute because of pending discussions about purchase of the Spreckels interests, including Western. When those discussions fell through, however, Western joined the institute in October 1928 (*ibid.*, 882). However, Sullivan was reported as one of the fifteen original directors of the institute (*Weekly Statistical Sugar Trade Journal*, 12 January 1928, 31), perhaps because Western cooperated in submitting statistics and received statistical reports even before it joined the institute.

17. Certificate of incorporation of the Sugar Institute, Inc., in Answer of the Defendants, *United States of America, Petitioner, v. The Sugar Institute, et al., Defendants*, in the District Court of the United States for the Southern District of New York, filed 1 August 1931, 66–67.

credible industry information played an important role in the decision of some refiners to join the institute. The testimony of W. Edward Foster, president of ASRC and one of the institute's organizers, is typical in this respect: "We . . . were rather cranks on the question of statistics. I could not see how any industry could operate successfully without knowing what was going on in the industry, because we were always moving around in the dark and we thoroughly believed that if the industry itself knew what was going on in the way of meltings [production] and deliveries, and had some knowledge of stocks, that we would have guiding posts which would enable us to better carry on our business."¹⁸

The macroeconomic environment, foremost the Great Depression, makes no appearance in the primary sources' discussions of the institute's formation and operation. This is in part because these sources relate to the early years of the Sugar Institute, that is, the two years before the stock market crash and the early, least severe, years of the Depression itself. But, in part, this is also due to the relatively good performance of the sugar refining industry in the early stages of the Depression. Compared to total industrial production, which declined 24 percent from December 1929 to December 1930 (Romer 1990), U.S. sugar consumption in 1930 declined by only 3.6 percent from the previous year.¹⁹ Such relative stability is consistent with Romer's finding (1990) that the onset of the Great Depression was associated with much sharper cutbacks in purchases of durables than of nondurables, seasonally adjusted sales of which actually rose in the last months of 1929 before decreasing only slightly in early 1930. Sugar is a staple good and, although storable, in purchase decisions is more like a perishable good. As the macroeconomy continued to tumble over the next several years, sugar consumption was affected, but less than industrial production as a whole. The *Weekly Statistical Sugar Trade Journal* (4 January 1932, 18) remarked that U.S. sugar consumption in 1931 "held up remarkably well," with a decrease from 1930 of only 2 percent. Consumption fell a further 5 percent in 1932, but leveled off in 1933–35.²⁰ The sugar *refining* firms were somewhat sheltered from the full effects of the Depression because contemporaneous economic and political developments brought low prices for raw sugar, the chief cost component in refined sugar.²¹

Any effect of the Great Depression was probably to strengthen the incentives of firms to cooperate within the Sugar Institute. First, the reduction of industry demand, and with it the exacerbation of conditions of excess capacity, made

18. Testimony of W. Edward Foster, R. 9206, quoted in Brief for the Defendants on the Facts, 20, District Court Record, box 504270A.

19. *Weekly Statistical Sugar Trade Journal*, 15 January 1931, 18, 9 January 1930, 18.

20. *Weekly Statistical Sugar Trade Journal*, 11 January 1934, 18. Consumption increased 1 percent in 1933 over 1932, fell 2.6 percent in 1934, and rose 4 percent in 1935.

21. World raw sugar production continued to rise in the 1930s, even as raw sugar prices reached record lows (Albert and Graves 1988, introduction).

competition less profitable and hence cooperation and collusion a more attractive alternative. Financial difficulties pushed two of the smaller refiners into receivership, Spreckels in 1930 and Texas Sugar in 1931. Second, information sharing may have had particular value in the new, more uncertain environment brought on by the Great Depression. The Depression brought about not only reduced economic activity, but also greater firm and consumer *uncertainty*. Thus the knowledge refiners had accumulated from their years of business experience had become partially obsolete. As a result, the gain from sharing demand information with competitors was heightened.

Turning from goals to initial structure, the Sugar Institute was organized as a membership corporation, that is, a corporation composed of and owned by member firms. The structural details of this organization illustrate the very decentralized nature of the institute. Each member firm was represented on the institute's board of directors by one, and later two, directors, and institute counsel Wilbur Cummings served as an additional director.²² The board of directors was authorized to elect a subset of directors to serve as an executive committee, which operated the day-to-day business affairs of the institute. Geographic proximity to New York City, where the Sugar Institute was located, of course favored the East Coast firms. Major decisions were reserved to the board.²³

Firms could be elected members of the Sugar Institute by a majority vote of the directors present, along with the payment of an initiation fee of \$500. Members could be expelled for nonpayment of dues or assessments by a majority vote of the directors present. Moreover, members could be expelled "for any conduct which, in the opinion of the Board of Directors, is prejudicial to the purposes, principles or interests of the corporation or for any other cause deemed sufficient by the Board" (By-Laws, 74-75). But expulsion was an unlikely punishment as it required a vote of at least *two-thirds* of directors present "at a meeting of the Board duly called and held for the purpose of taking such action" (75). So the institute itself had little punitive power.

The board of directors was authorized to appoint a statistics committee to "submit to the Board of Directors a detailed plan of reports to be made by the members to the [Sugar Institute]" (By-Laws, 81). Upon approval of the board, this plan was to be submitted for approval by the members, adoption or any modification requiring a four-fifths vote. At the December 1927 meeting it was initially suggested that members be required to submit any reports that the

22. The number of directors was increased to twenty-eight by a vote at the annual meeting of members on 17 January 1929 (Answer of the Defendants, 79). Place's memo on the 14 March 1929 meeting of the board refers to the election of "additional Directors from each of the members." Also, the election for the board in 1930 brought each of the then fifteen members two representatives (*Weekly Statistical Sugar Trade Journal*, 23 January 1930, 55).

23. The bylaws stipulated that the "Executive Committee shall not be empowered to elect or expel members, to amend these By-Laws or to change the Code of Ethics" (By-Laws of the Sugar Institute, Inc., in Answer of the Defendants, 79).

institute or the Statistics Committee demanded of them. But Arbuckle Brothers refused,²⁴ and the agreed-upon rule became that “no plan requiring reports from members shall be binding upon any member without it shall have been approved by such member” (81).

As this example illustrates, the institute’s institutional design was both cause and consequence of the institute’s problems in attaining its professed goals. Many of the provisions that weakened the institute were deliberately incorporated into the original design. That, in turn, reflected an unwillingness of (some) refiners to cede discretion to a central industry organization. It is this unwillingness, coupled with the structural weaknesses, that undermined the institute’s efficacy.

3.3.3 An Initial Assessment

Despite these weaknesses, however, the industry did come to exchange information previously unavailable to the refiners. This included weekly total meltings (production), total stocks on hand, and total deliveries. In addition, information as to deliveries and stocks by state were distributed weekly and monthly. The institute’s statistical services were a point of pride in the refiners’ defense at trial, and the Defendants’ Fact Brief devotes a section to it. These particular defense claims are supported both by the public record and the private accounts of Placé.

The refiners claimed that this information “collected by the Institute could not have been obtained by the trade *through any other source*.”²⁵ This claim is somewhat exaggerated. Accurate raw sugar imports were available from the Customs House, and the premier trade publication of the period, the *Weekly Statistical Sugar Trade Journal* (see fig. 3.1), had been reporting them for years. However, although there were no uses for raw sugar other than refined sugar, at high frequencies these figures could be used only to guess the aggregate level of production given the variable length of time for which raw sugar was stored. The journal did report production at the regional level, but, again, at high frequencies the reported figures were in part estimates; the journal’s publisher and chief statistician testified that he received reports from the refiners “[w]eekly, monthly, semi-annually or, at least, yearly.” The journal also published figures on deliveries, although only Western and C&H actually reported theirs. The deliveries of the other refiners were estimated on the basis of their production and estimates of their refined sugar stocks.²⁶ The journal published no information on the location or level of consignment stocks, or state-level sales. Thus, trade statistics were available before the Sugar Institute, but they were inaccurate, especially at high frequencies and the farther downstream the stage of activity.

24. Testimony of Goetzinger, in Transcript of Record, 2:680, District Court Record, box 504274A.

25. Defendants’ Fact Brief, 69, District Court Record, box 504274A.

26. Gardiner, in Transcript of Record, 1:362, 369, District Court Record.

The institute's provision of state-level data may have been of greatest value to the firms. Prior to the Sugar Institute, individual refiners knew little beyond their own figures about the consumption and distribution of sugar in specific portions of the country. Because each operated only in particular geographic markets, this information was much more important than national aggregates. Campiglia of C&H testified that "the distribution by States . . . gave us a comparison with distribution of former years by States, and it gave us the quantity of stock of raw sugars and refined sugars on hand; and permitted us to determine whether stocks were piling up and accumulating or moving out freely to the trade; and many things which we considered valuable to us."²⁷

The institute achieved only temporary success in exchanging sales statistics. In light of the consensus to report meltings and deliveries, what additional information would sales statistics provide? Most sugar was sold on one of the price "moves." With the knowledge of a firm's meltings and deliveries in the aftermath of a move, one could eventually estimate its sales. However, recall that the reported weekly deliveries and meltings were aggregated before being distributed to institute members. In the aftermath of a price move, these figures would help refiners estimate total sales, but not the sales of any individual refiner.

Aggregate sales statistics would therefore provide more immediate information on the level of demand. Individual sales statistics could help indicate whether a given refiner was offering secret concessions. Assuming truthful reporting, if a refiner obtained unusually large sales on a given price movement, its rivals might infer that it had offered a secret concession. In practice, the refiners agreed to circulate aggregate sales statistics, and then only temporarily.

3.4 Evolution: Inducing Information Exchange

We are faced with a puzzle. If the Sugar Institute was such a weak organization, lacking much central authority, how was it able to attain any of its goals? At an initial reading, the provision that no report would be mandatory upon a member unless approved by that member would seem to guarantee that the Sugar Institute would effect no improvement in information exchange. But the organization of the institute, along with this provision, created a framework in which members could debate and bargain over what reports would be binding. In this section we examine the learning process, and analyze the factors contributing to the institute's successes and failures in overcoming the incentive problems involved in organizing information exchange.

3.4.1 Agreeing on Shared Statistics

Arbuckle Brothers objected to the original demand that the Statistics Committee have a claim on *all* statistics because the claim was unspecified. "I stated

27. Quoted in Defendants' Fact Brief, 19–20, District Court Record.

that we would not agree in advance to give anybody all the information they asked for concerning our business,” its representative at the early meeting later testified. It is entirely reasonable that firms would not want to surrender control over their proprietary information on an *ex ante*, *carte-blanche* basis. At this initial stage of organizing the Sugar Institute, potential members could not possibly anticipate what information might be sought in the future. But that concern need not translate into a resistance to all information exchange. Rather, the adopted provision allowed firms to determine what information would be required, after the agreement was signed. Thus was the legitimate fear of an overly inquisitive Sugar Institute structurally allayed. This *ex post veto* gave each firm a bargaining chip in the *ex post* negotiation over what information was to be required.

Since reporting was not mandatory, attempts were made to induce “voluntary” reporting of statistics, especially sales statistics. One approach was to use the Sugar Institute as a forum for moral suasion, or as a “bully pulpit.” This was an initial tack taken by Judge Ballou, executive secretary of the Sugar Institute. Ballou repeatedly emphasized the collective and, by implication, individual interest in having sales statistics available. At the 14 March 1929 meeting of the directors, Ballou indicated that C&H suspected that it had received inferior sales volume on the previous buying movement because of the failure of eastern refiners to enforce the thirty-day limit on contracts. Rolph of C&H further indicated his intention to “investigate upon his return to San Francisco the amount of sugar that they sold in various parts of the country and if he arrives at the conclusion that the C. & H. proportion of sales were smaller than the share to which they were entitled he indicates that it will be his intention to break the price to the 4.75 cents basis again. Judge Ballou seized upon this opportunity to again express to all refiners present the desirability of having statistics on sales available for the Institute. Such statistics would make it impossible for anyone to arrive at an imaginary grievance regarding the amount of sugar sold by any one refiner.”²⁸

Ballou’s statement is noteworthy for several reasons. First, exchange of sales

28. Placé Memoranda, Board of Directors meeting, 14 March 1929. Taken out of context, one might view Rolph’s reference to the market “share to which they were entitled” as an indication that the Sugar Institute was administering an explicit price-fixing or market-allocation agreement. But the entire private and public record strongly indicates otherwise. Certainly, individual members at times spoke, almost wistfully, about using production quotas, but such matters were never acted upon. Typical is the following entry in Placé: “Mr. Babst submitted a formula for the self-regulation of meltings of individual refiners. He suggested that proper percentages of total melt must be arrived at by individual refiners taking the capacities of all refiners reported to the U.S. Government during War-time ‘control’ plus 50% of any subsequent increase in capacity. . . . This question of ‘self-regulation’ was discussed at great length but no decision was arrived at. No one expressed any opinion regarding Mr. Babst’s proposed formula (11 April 1929, 1). Almost a year later, Bartlett complained “that, in spite of all the pretty speeches which have been made on this subject, there is no evidence of this principle being put into practice. Mr. Foster replied that, unfortunately, the Institute’s attorney does not allow discussion of this subject on a basis which could bring actual results” (6 February 1930, 1).

information was linked to contract enforcement and homogeneity of contractual terms, at least in C&H's mind. Second, Ballou suggests that information exchange was meant, in part, to avoid price wars that would otherwise be triggered by outside factors, such as shocks to industry demand. Third, he tried to show why it was in the *individual* interest of firms to supply this information. If the absence of complete sales information triggered a price war, all firms in the industry would be harmed, including those that had chosen to keep their sales statistics private.

Moral suasion was insufficient, at least for some refiners. At this same meeting, ASRC's Foster "very emphatically stated that in his opinion it was no one's business how much business [ASRC] or any other refiner booked on any one buying movement. He stated that [ASRC] would refuse to give any statistics on sales. This had been the position of [ASRC] from the very start." ASRC was the largest of all the cane refiners, with a market share of about 25 percent. Its sales statistics would therefore be very informative about industry-wide fluctuations. This indicates the seriousness of ASRC's refusal to provide statistics, and suggests a possible source of that refusal—ASRC may have been large enough to infer industry trends on its own. Moreover, ASRC operated several plants and was active in a number of markets throughout the country, which may also have given ASRC a greater ability to assess market trends independently. ASRC's nonreporting led other firms to do the same. National, Pennsylvania, and Federal, respectively the second, third, and eleventh largest members of the institute, stopped reporting sales.²⁹ This suggests a domino effect ordered by firm size, since the largest firm reporting its sales may provide more information than it receives in return. Of course, this does not account for why the smaller Federal halted its reports.

With information exchange breaking down, the Sugar Institute switched to an exclusionary disclosure rule. In the 28 March 1929 meeting, Ballou "reported that he had issued (only to those refiners who were reporting sales) some interesting statistics regarding the last buying movement. He is to follow this up with further statistics regarding the rate of withdrawal of these contracts. Any refiner not now receiving these statistics can secure them by reporting his own sales records."³⁰

Placé advocated a more radical change. In early April 1929 a memo that he authored was presented by McCahan's president at a special Institute Founders' meeting. The memo, which framed a sizable portion of the meeting's agenda, characterizes the early structure of the institute as suffering from nearly fatal flaws. "The conception (generally), the discussion, the wording, the approval or the rejection, and finally, the enforcement of the Institute's 'resolutions' are all dictated, not by an impartial, well-considered and comprehensive plan for the benefit of the Industry as a whole, but by the self-interest of the individual

29. Placé Memoranda, Board of Directors meeting, 14 March 1929, C&H, the third largest firm in the industry, was not a member of the institute at this time.

30. Placé Memoranda, Executive Committee meeting, 28 March 1929.

members on each separate issue. This fundamental defect in the Institute's organization has manifested itself in numerous issues," including the provision of statistics. On this issue "[d]ifferent members have arbitrarily assumed the right to refuse to furnish to the Institute any statistics which they, individually, do not care to reveal, irrespective of whether or not the Institute believes such statistics to be important in preventing serious misunderstandings." After surveying other problems attributed to the Sugar Institute's decentralized structure, the memo proposes "delegating positive power to some central authority," specifically an executive officer with binding authority.

The assembled Institute Founders referred the issue to the Statistics Committee to decide on the statistics required. The decision of that committee was "to be binding on all members." Nevertheless, no additional penalties were authorized for noncompliance with requests for statistics. At the 2 May 1929 directors' meeting, considerable discussion about enforcement resulted in the creation of an Enforcement Committee "with the power to issue regulations for the enforcement of the resolution passed today and with the authority to pass judgment on any disputed case involving brokers, warehousemen or merchants." This did not mark the end of the institute's enforcement problems, but it did set up a more explicit institutional structure for addressing those issues. By August 1929 at the latest the Enforcement Committee was successfully requesting refiner reports on undelivered contracts to assist in contract enforcement.³¹

Compliance with the request for statistics increased thereafter, although it was not accomplished immediately or uniformly. But as we have noted, the refiners came to agree to furnish weekly reports on meltings, deliveries, total stocks, and deliveries by state.

Despite these areas of agreement, there was still the highly sensitive issue of sharing of sales statistics. The major objections against furnishing sales statistics came from ASRC, National, and Arbuckle Brothers (United States Temporary National Economic Committee 1941, 121). These were the first, second, and fifth largest firms in the industry, and so they may have felt that their individual sales statistics were sufficiently informative that sharing these numbers would not be a fair trade. Another laggard in providing sales statistics was Colonial, one of the smallest refiners but also one accused of engaging in unethical practices during the institute.³² Colonial's refusal was probably an attempt to hide its violations, however much its refusal might have been tantamount to an admission of guilt.

Since the institute was unable to make sales statistics mandatory, it reverted

31. Placé Memoranda, Enforcement Committee meetings, 8 August 1929, 22 August 1929, Placé was placed on the Enforcement Committee only on 1 August 1929, which therefore marks the beginning of his memoranda on the Enforcement Committee. It is possible that refiner reports to the Enforcement Committee on undelivered contracts might have been occurring for several months previously.

32. Colonial eventually acknowledged some of these violations (Placé Memoranda, Enforcement Committee meeting, 3 October 1929).

to use of an exclusionary disclosure rule; only those members making sales reports would receive sales statistics. This tactic was successful for a time in encouraging some participation, but it ultimately unraveled. C&H, which had become a member of the institute in September 1929, stopped reporting its sales statistics in February 1930, because five other refiners were not reporting.³³ Although not identified, these firms presumably included ASRC, Arbuckle Brothers, and National, whose opposition to supplying sales statistics was unconditional. If so, then C&H would have been the largest firm supplying sales statistics before halting its cooperation. C&H may have felt that cooperation on those terms was an unfair trade, since it was providing a relatively precise signal of West Coast demand in exchange for a relatively imprecise indication of East Coast demand. This precipitated a renewed discussion by the institute board. ASRC, Arbuckle Brothers, and National declared themselves “unalterably opposed” to reporting sales. Colonial, Spreckels, C&H, and McCahan refused to make sales reports unless all did. It was decided that “[t]he other eight refiners are to continue to make [these] reports and, in turn, they (and only they) will receive from the Institute a report on the total ‘Sales’ . . . made by the eight refiners involved.”³⁴ But the handwriting was on the wall, and two months later, by which time only Savannah, Henderson, Imperial, and Texas, all southern refiners, were reporting sales, the collection of sales statistics was abandoned.³⁵ As the number of cooperating firms declined, the “aggregate” sales statistics became less informative about general market trends and more revealing about the business patterns of the cooperating firms, information that those firms might wish to remain private.

So while the attempts to exchange data on meltings and deliveries were successful, the attempt to exchange sales information was ultimately not. Interestingly, although the *Weekly Statistical Sugar Trade Journal* had been reporting weekly (estimated) meltings and deliveries since the 1880s (indeed, the credibility of these published statistics may be supported by the journal’s longevity), the journal never published sales statistics. One interpretation of the difference between meltings/deliveries and sales is that the former statistics were nearly common knowledge without the institute, and the institute exchange merely made the public information more accurate. As noted earlier, independent information was available on those series from raw sugar purchases. On the other hand, perhaps that information (in part provided to the journal by the refiners themselves) was more publicly available precisely because it was less sensitive than sales information.

Since it was the larger firms that were the most reluctant to provide sales statistics, why did the larger firms participate at all? They participated because of their interest in facilitating collusion. A firm that does not intend to cheat on the collusive understanding has an incentive to share credibly its own infor-

33. Placé Memoranda, Board of Directors meeting, 14 February 1930.

34. *Ibid.*, 13 March 1930.

35. Placé Memoranda, Executive Committee meeting, 15 May 1930.

mation, since that establishes to other firms in the industry that, in fact, it did not cheat. The alternative to information exchange might have been either continued cutthroat competition or intermittently successful collusion, with adverse industry-wide demand shocks resulting in periodic price wars. The larger firms, precisely because they controlled a greater share of industry output, had a larger incentive to make collusion workable than did the smaller firms. But the larger firms may have thought that shared meltings and delivery information would be sufficient to detect and absolve cheating, and that individual sales statistics would reveal too much about an individual refiner's business strategy.

Moreover, even if collusion motivated the formation of the Sugar Institute, it need not have embraced all the firms in the industry. In particular, the five Institute Founders may have organized the institute with an eye toward monitoring the fringe competitors. They might have doubted these fringe firms' willingness to stick with a collusive agreement, or they might have had uncertainty over these firms' supply functions. Under this view, the institute attempted to gather and disseminate aggregate industry statistics so that the larger firms could subtract out their own figures and thereby infer the supply (functions) of the fringe. This knowledge could then be used in future pricing decisions, much the same way as a dominant firm would set a price anticipating the supply response of the competitive fringe. Conversely, the promise of demand information, more valuable to the small than to the large firm, may have been the carrot that induced the small firms to participate. Unfortunately, we have uncovered no narrative evidence in support of either interpretation.

3.4.2 Audits and Investigations

Auditing and direct investigation of refiner or affiliated businesses' records provided another source of shared information. These were intended to enforce the Code of Ethics, rather than facilitate information exchange narrowly construed. There is no indication of any audit of a refiner report concerning its own meltings, deliveries, or sales, although refiner consignment stocks were audited.

The Enforcement Committee investigated and ruled on affiliations between brokers and warehouses, and between customers and warehouses. To that end, it was authorized on 9 May 1929 to retain investigators' firms to follow up on complaints, and it subsequently retained the firms Proudfoot-Chinal and the Bishop Agency. Although the authorization for these investigations nominally concerned only the separation of brokerage and storage activities, the implicit scope was much broader. At the 29 May 1929 meeting of the institute board, Colonial indicated "that refiners should be willing to throw their books open for the investigation of *any* violation of the Code of Ethics." Other firms agreed, although they found no need to adopt a resolution "because no refiner had ever failed to supply full information on any subject requiring investigation."³⁶

36. Placé Memoranda, Board of Directors meeting, 29 May 1929.

Investigations of brokers and warehouses proceeded, many times without incident. But conflicts sometimes arose when a buyer or broker who had a close relationship with a single refiner was involved. When an investigation by an institute employee, Patterson, revealed that the Webster Grocery Company was affiliated with warehouses, Godchaux, which supplied Webster, objected to the findings, and the Enforcement Committee agreed to a new investigation by Proudfoot-Chinal.³⁷ When shortly thereafter the institute board authorized an investigation of warehouses and it was suggested that Patterson conduct it, the Godchaux representative "stated very emphatically that he . . . will not allow Mr. Patterson to enter the Godchaux offices again as he considers him inefficient, biased, and liable to make unsupported accusations."³⁸ Other board members spoke in Patterson's defense, but it was decided that the investigation of warehouses throughout the nation required a national agency, and so an outside firm was retained instead.³⁹

These episodes suggest the hazards the institute faced in choosing its investigators and auditors. The institute typically decided upon an outside firm, rather than rely on member refiners themselves or use an institute employee. As the Patterson example illustrates, the neutrality of an institute employee might be challenged and thereby undermine the employee's effectiveness in other tasks. Retaining outside firms was costly in its own way. For example, the auditing firm of Haskins and Sells, retained to audit the stocks refiners were storing in consignment markets, acknowledged at the outset that it did not have experience conducting that type of audit.⁴⁰ The refiners themselves had employees with the requisite experience, but they were not used by the institute, presumably because their independence would be in doubt.⁴¹

The level of consignment stocks was the only area in which refiners themselves were audited. There is a single recorded incident in which a refiner withdrew its permission for such an audit. Godchaux refused permission on the grounds that its original agreement "was given with the provision that Colonial also submit to a similar audit. [But since] the Institute lacks knowledge of the warehouses in which Colonial is storing, this proviso has not been lived up to."⁴² Though a single incident, this points up a weakness in the blanket authorization for the institute to conduct audits, namely, that the authorization was not binding. Just as firms were required to file statistical reports yet could fail

37. Placé Memoranda, Enforcement Committee meeting, 15 August 1929.

38. *Ibid.*, 12 September 1929.

39. Proudfoot-Chinal was too small a firm to undertake this investigation.

40. Placé Memoranda, Board of Directors meeting, 28 February 1929.

41. Williamson's discussion (1975) of the auditing capabilities of a firm may be relevant here. He argues that an audit conducted by an internal agent, such as a representative of the general office, will be more successful than an outside audit. In addition to the greater legal rights that an internal auditor will possess, the internal auditor will receive greater cooperation from the audited unit. Similar cooperation with an outside auditor could be viewed as disloyal. In this setting, however, the need for independence and neutrality was paramount.

42. Placé Memoranda, Executive Committee meeting, 7 November 1929.

to file a report in any given week, firms could be required to open their books to the institute yet rescind that authorization in any particular case. These issues are intimately connected with the hybrid organizational design of the Sugar Institute. Just as a firm retains residual control over its information, it controls the residual right to refuse an audit by an outside agency. Even under the institute, that right was retained by the individual firms, and was waived only on a case-by-case basis.

3.4.3 Confidentiality

The Sugar Institute revealed less information to its members than it knew. It received the complete vector of reports from its members, but in most cases aggregated it before distributing it to them. In this, the institute may have been steering its way between the 1921 and 1925 Supreme Court decisions discussed in the introduction. On the other hand, aggregation may have been a requirement of incentive compatibility. A firm might not want to reveal to its competitors its own information, but might be willing to reveal that to a third party who would aggregate it first. Either reason supports the need for an intermediary.

The incentive-compatibility reason also suggests the importance of the procedures that an intermediary adopts to ensure confidentiality. Clearly, this was a concern of refiners. The institute reporting system was designed to protect confidentiality. Individual member reports were received by the institute staff, and a letter code assigned each refiner. The individual statistics were then transferred onto standard institute forms identified by code letter, without reference to the refiner's name.⁴³ Clearly, these efforts depended upon the integrity of the institute staff. There is no indication of any leakage of individual refiner reports. An aggregate, annual report of Sugar Institute statistics did find its way into the hands of an economics professor, and members were sufficiently upset to bring the matter to the Executive Committee.⁴⁴ The importance of the staff was highlighted after the district court decision against the Sugar Institute. Several refiners spoke of replacing the Sugar Institute with a newly organized united sugar association, which would gather, aggregate, and disseminate statistics on past prices and terms under the legal restrictions imposed by the court. An unsigned memorandum advancing this proposal noted, "Naturally, the integrity of the Association staff must be above suspicion so that no member need fear that the intimate details of his business shall be divulged."⁴⁵

43. Minutes of the Executive Committee meeting, 30 November 1936, in Placé, W. J. McCahan Sugar Refining and Molasses Company, Sugar Institute: Reorganization and Closing, subject group 3, box 11.

44. Placé Memoranda, Executive Committee meeting, 7 November 1929.

45. Although unsigned, it is likely that the memorandum was drafted by Louis Placé and/or William Tyler of C&H (Placé, Sugar Institute: Reorganization and Closing).

3.4.4 Contract Enforcement and Misreporting

Statistical exchange advanced adherence to the Code of Ethics, as exemplified by the enforcement of delivery on thirty-day contracts.⁴⁶ Recall that refined sugar was purchased on a price move, and that the customer thereby purchased the right to take delivery gradually over the following period, which prior to the institute was thirty days or more. The Institute tried to restrict contracts to exactly thirty days, and in order to monitor compliance, the Enforcement Committee requested and received reports from refiners.

A standard contract stipulated only the quantity of sugar and the basis price, the price for standard granulated. Details such as the grades of sugar the customer wished to receive did not have to be specified until shortly before delivery.⁴⁷ If a customer had not yet furnished these instructions, that contract remained unspecified. All unspecified or undelivered contracts were supposed to be reported to the institute for each price move. These reports were not aggregated across refiners before dissemination. These figures were of interest as the contract due date approached since a firm carrying a large balance of undelivered or unspecified contracts was unlikely to meet the due date, either because of capacity constraints in production or transportation, or because the high balances signaled an unwillingness to pressure customers to take delivery. This information allowed other refiners to adjust their contract enforcement, and threaten to do so. This in turn could provide incentives for the uncooperative refiner to strengthen its own contract-enforcement efforts.

In most instances, this information was reported accurately. Some firms initially refused to supply contract figures, but this was met successfully by the actual and threatened retaliation of nonreporting by other firms. In a few other instances irregularities in reported numbers arose, apparently due to sincere misunderstandings as to how contracts should be classified.⁴⁸

There appears to have been only a single case of intentional misreporting. Before a meeting of the Enforcement Committee in January 1930, National's representative confided to Placé and an institute staff member that he had definite evidence that other refiners had "failed to receive specifications for some contracts which they have reported to the Enforcement Committee as being specified." Consequently, National would refuse to continue reporting contract-enforcement figures, and would not undertake to force deliveries. Placé responded that he had heard similar rumors and so he "thought a 'show-down' was necessary."⁴⁹

46. The institute gathered other statistics that played a role in code compliance. These were "the amount of sugar on consignment by states (weekly), the amount of sugar stored in transit by states (weekly) and the amount of sugar moved by eastern and southern differential routes for refiners' account and for customers' account. This information (being of little or no interest to the trade generally) was ordinarily sent only to members and to the importers" (Defendants' Fact Brief, 69-70, District Court Record).

47. An example of a grade is powdered sugar, which results from crushing granulated sugar.

48. Placé Memoranda, Enforcement Committee meeting, 9 January 1930.

49. *Ibid.*, 23 January 1930.

When the meeting opened, the representatives of ASRC and Spreckels admitted that they had large balances of undelivered contracts with A&P, a major sugar customer. In both cases, they had received “dummy” instructions from A&P, meant to be canceled later, but they had classified these contracts as “specified” for institute reporting purposes. National had received and refused similar instructions from A&P, and had therefore classified its A&P contracts as unspecified. National repeated its intention to withhold contract-enforcement figures.⁵⁰ Nevertheless, the next week National agreed to return to supplying contract-enforcement figures on the understanding that all refiners would make “honest” reports.⁵¹

Although this is a case where misreporting occurred, it illustrates the factors that prevented it from completely undermining the agreement. First, information was available from other sources to detect possible misreporting, and this information was sufficiently credible to be used as a basis for retaliation. Second, retaliatory nonreporting was apparently sufficient to deter additional problems. Finally, the detail that Placé accords this incident suggests that misreporting was rare.

3.4.5 Participation: Members and Nonmembers

The Sugar Institute did not encompass all sugar producers, nor even all cane sugar refiners. Both technological and geographic differences limited the association's expanse. The largest California refiner was not initially a member of the institute. Offshore refiners always remained outside the institute. And beet sugar producers were organized in a separate trade association, the Domestic Sugar Bureau. Even among members themselves, there were important geographic differences. Refiners differed in the cost of shipping their sugars to consumption centers. The distance and the transportation mode (rail versus water) varied by the refiners' location. Nevertheless, over time, the institute acknowledged and accommodated these heterogeneous interests, if not through membership, then through cooperation.

C&H was the third largest U.S. cane sugar refiner, and the largest in California. Its primary marketing area was the western states, although it did compete directly with New Orleans and East Coast refiners for sales in the Midwest, including Chicago. The West was the center of the beet sugar industry, and so C&H's main competition came from there. While the Sugar Institute was being formed, similar discussions were being held among beet and Louisiana cane firms about forming the Domestic Sugar Bureau. These groups considered their interests to be opposed to those of the cane sugar refiners, and so to foster good relations with its beet sugar rivals, C&H initially chose to join their association and remain outside the other (United States Temporary National Economic Committee 1941, 115–16). Moreover, President Rolph of C&H, who desired a single trade association encompassing all sugar producers, thought

50. *Ibid.*

51. *Ibid.*, 30 January 1930.

that remaining outside the institute gave him the opportunity to persuade beet sugar interests of the desirability of union.⁵² If C&H failed to merge the associations within two years, Rolph intended to apply for institute membership.

To the eastern refiners C&H was the scourge of the industry. Rudolph Spreckels testified at tariff hearings in June 1929 that while "C&H has not always precipitated the cut in refined . . . I have found their fine Italian hand back of every refiner's cut that has been made."⁵³ The eastern refiners' private assessments were no kinder.⁵⁴ Underlying this eastern pique was a genuine divergence of interests born of geography. Since Hawaiian raw sugar faced a lower tariff than Cuban, C&H's refining costs were lower than the eastern refiners. On the other hand, in the Midwest, where C&H and the eastern refiners actively competed, the latter were advantaged by the shorter distance to the East Coast and the cheap water transportation over the Great Lakes. C&H's absorption of this freight cost differential reduced the prices eastern refiners could command not only in the Midwest, but also within their own territories, because they could not completely price discriminate between the two regions. These differences, particularly C&H's need to absorb transportation costs, were at the heart of the C&H participation issue. Differences in costs across refiners made collusion more difficult to achieve.

Despite these differences, there were also shared interests, which helps accounts for the consultation between C&H and the institute. That Ballou had formerly served as C&H's counsel aided this interaction. Nevertheless, there were limits to what could be accomplished while C&H remained a nonmember, and by September 1929, C&H was prepared to join the Sugar Institute. Having concluded that a merger of the beet sugar and cane sugar trade associations was not imminent, Rolph carried out his initial plan to join the institute roughly two years after its formation. Nevertheless, C&H insisted on retaining its membership in the Domestic Sugar Bureau. Its application for Sugar Institute membership included the proviso that in any situation in which institute requirements conflicted with those of the bureau, the C&H would not be responsible for adhering to the institute requirement.⁵⁵ This term was accepted. There were not many conflicts between the two associations' requirements, yet this was still a considerable concession by the Sugar Institute. The willingness of incumbent members to accept a separate set of rules for C&H indicates that they had decided to address the differences with C&H within the institute rather than outside it. For C&H, membership gave a voice and vote in shaping ongoing institute resolutions; each had value precisely because the Sugar Institute was an evolving, learning organization. Correspondingly, the institute preferred C&H as a member because that made enforcing adherence to resolutions easier. Moreover, membership facilitated communication among refiners.

52. Placé Memoranda, Executive Committee meeting, 19 September 1929.

53. Spreckels testimony, U.S. Senate 1929, 167.

54. Placé Memoranda, Executive Committee meeting, 8 March 1929.

55. Placé Memoranda, Executive Committee meeting, 19 September 1929.

The Sugar Institute did not absorb all relevant interests under its tent. One example was Hershey, an “offshore” refiner operating in Cuba. Although a nonmember, Hershey intermittently supplied statistics on contract enforcement.⁵⁶ When C&H joined the institute, Ballou suggested that eventually the institute might extend Hershey at least associate membership.⁵⁷ Later, a group of southern refiners proposed that the institute either force Hershey to discontinue its “unethical” business practices in Florida or invite it to join the institute. But Spreckels and C&H, who, unlike the southern refiners, did not compete with the offshore refiners, objected to extending cooperation to membership, because offshore and domestic refiners had diametrically opposed interests on the tariff on imported refined sugar. It was felt that membership for Hershey might undermine the institute’s efforts to lobby for a higher refined tariff.⁵⁸

Tariff matters also played a role in keeping the beet sugar producers and the cane sugar refiners apart. As documented in Ellison and Mullin (1995), the domestic cane sugar refiners wanted a high tariff on refined sugar and a low tariff on their input, raw (cane) sugar. The beet sugar manufacturers, on the other hand, wanted a high tariff on imported raw cane sugar, the essential input of a near perfect substitute. Moreover, beet sugar was produced by dozens of small, price-taking firms (the price of sugar in western states equaled the San Francisco base price plus freight from San Francisco, where the West Coast cane sugar refiners were located). As a result, no individual firm had the incentive to join the institute. If the institute advanced collusion, each beet firm would prefer to free ride on the higher price.

Nevertheless, there were common interests among all sugar producers, and these were advanced through consultation between the respective trade associations.⁵⁹ The institute and the Domestic Sugar Bureau exchanged figures on the deliveries of all sugar, cane sugar, and beet sugar, by state, on a monthly basis.⁶⁰ Since beet sugar accounted for over 14 percent of U.S. consumption, such information was essential for estimating demand at both the national and regional level. Since each cane refiner had particular territories, the regional decompositions were particularly valuable. A second, less benign use would be for a division of markets between the beet and cane interests,

56. Placé Memoranda, Executive Committee meeting, 24 October 1929, indicates that Hershey was supplying its figures on undelivered contracts through its broker, Pike, and that Pike was requesting that the institute reciprocate. Hershey statistics on undelivered contracts are reported in the next week.

57. *Ibid.*, 19 September 1929.

58. Placé Memoranda, Board of Directors meeting, 24 July 1930.

59. The Domestic Sugar Bureau had its own concerns in terms of securing membership and adherence, which is beyond the scope of this paper. “The Bureau represented 80 to 90 percent of total beet sugar production and about 30 percent of Louisiana cane production. Although none of the beet companies east of Chicago was included in the membership, the only important non-member was the Michigan Sugar Co.” (United States Temporary National Economic Committee 1941, 116).

60. Defendants’ Fact Brief, 70, District Court Record.

although there is no indication that a formal or informal division of markets ever took place.⁶¹

3.5 After the Sugar Institute

The half decade that followed the spring of 1930, when the Placé minutes trail off, saw a constantly changing legal environment for the refiners. In the spring of the next year, the Department of Justice filed suit. 1933 saw the passage of the Agricultural Adjustment Act (AAA) and the National Industrial Recovery Act (NIRA), both of which held out the promise not only of government relaxation of antitrust restrictions on industry association activities but, initially, of government enforcement of those actions as well. In 1934 the government passed the Sugar Act, which established quotas on the importation of raw sugar and the production of beet sugar and marked the beginning of continuous government involvement in the industry. Though not directly collusive, this act did protect domestic refiners from entry in the form of offshore refiners and beet producers. But two months later the District Court found against the refiners in the *Sugar Institute* case. Around this time, the refiners became aware that the government would not enforce the AAA or NIRA codes. The beginning of the end of the New Deal experiment in corporatist economics came in the 1935 Schechter decision, which declared the NIRA unconstitutional. The Supreme Court annulled the AAA as unconstitutional in January 1936, shortly before issuing its verdict in the *Sugar Institute* case.

Several times during this period, the Sugar Institute tried to reinvent itself—first as a code of fair competition under the AAA, then as an all-encompassing sugar-producer association, and finally as a revised institute that would be in compliance with the Supreme Court decision, before abandoning any attempt at a trade association in November 1936. Although none of these plans ever came to fruition, they nonetheless reflect what refiners learned from the Sugar Institute experience, and how they responded to the changed legal environment.

The refiners' first response to the New Deal legislation was to move to dismiss their case. The motion was rejected; nonetheless, the district court decision did stipulate that the decrees could be modified if the refiners so requested under the NIRA.⁶² In the meantime, the refiners had submitted a code of fair competition under the AAA in August 1933.⁶³ Like many other such codes,

61. At one institute Executive Committee meeting, the representative from the Domestic Sugar Bureau displayed a map he intended to circulate showing a potential division of markets. Nevertheless, the plans for circulating this map were quickly abandoned (Placé Memoranda, Executive Committee meeting, 8 March 1929, 16 May 1929).

62. *United States v. Sugar Institute*, 15 Fed. Sup. 910 (1934).

63. The proposed code is reproduced in *Weekly Statistical Sugar Trade Journal*, 10–31 August 1933, 327–63.

it called upon the secretary of agriculture to restrain new entry and capacity expansion, to allocate production directly if necessary, and to license all members of the industry.⁶⁴ It conferred upon the refiners the right “to confer among themselves” to halt ruinous price cutting, and its article 3, “Unfair Competition,” condemned the same practices as the Sugar Institute’s Code of Ethics.

The organizational structure envisioned in the AAA code differed significantly from that of the Sugar Institute. The “one refiner, one vote” system of the institute was supplemented by an additional requirement that gave larger refiners a greater voice. Changes to the AAA code would require approval of not only a majority of directors, but also the assent of refiners with a combined market share of at least two-thirds.⁶⁵

This strengthening of the voting powers of the larger firms was accomplished in the face of the ability of small refiners to block the agreement itself, for the refiners had been informed that the secretary of agriculture would accept only a unanimous agreement.⁶⁶ In contrast, individual refiners had no such veto over the formation of the Sugar Institute; indeed, as we have shown, not all relevant sugar producers were at all times members of that association. Evidently, experience under the Sugar Institute had taught refiners that it was important that the larger firms have greater formal voting rights in industry deliberations.

This outcome stands in sharp contrast to that of many other industries. Brand (1988) has emphasized that the political power of small firms led industries to approve codes that were disadvantageous to the larger firms and so unsustainable without government enforcement. Alexander (1997) illustrates this process for the macaroni industry, whose code was crafted to appeal to the majority of smaller, less efficient firms. When the government then failed to enforce the industry codes, the industry’s attempts at collusion were undermined by the aggressive pricing of the larger, lower-cost firms. These important cost asymmetries were not accommodated within the industry code, and this proved fatal to its success.

The steel industry affords a more appropriate comparison. As in the sugar industry, a consolidation near the turn of the century had created a dominant firm with a near monopoly that by the 1930s had remained the market leader notwithstanding a sizeable decline in market share over the intervening decades. In granting firms differential voting power in its NIRA code, the steel industry departed from the “one firm, one vote” system even more sharply than the sugar industry. U.S. Steel and Bethlehem Steel possessed 511 and 160 votes, respectively, in the code authority, while each of the other thirty-eight firms possessed only 1 to 86 votes, depending upon firm size (National Recovery Administration 1934). Evidently, the steel firms had also learned the neces-

64. *Ibid.*, 10 August 1933, 330–31.

65. *Ibid.*, 31 August 1933, 361.

66. Placé Correspondence, memo from Ellsworth Bunker, 24 July 1934.

sity of giving greater voting power to the larger firms. As with the sugar industry, a prior collusive experience may have determined the response to the New Deal legislation. Lamoreaux (1985) has argued that U.S. Steel's policy after 1902, shortly after its formation, of cutting prices when demand was slack taught the independents to curtail their output in recessions. That industry's equivalent of the Sugar Institute was the Gary dinners, which served as an avenue to notify the independents of U.S. Steel's intentions. History had thus conditioned members to the benefits of an asymmetric cartel headed by U.S. Steel. Baker (1989) has provided the quantitative evidence that the steel industry was able to reap the collusive gains offered by the NIRA.

The AAA code strengthened not only the large firms but the coordinating body itself. Discretion over statistical reports and auditing authority would be transferred from the member firms to the board of directors. It would have blanket, *ex ante* authority to conduct audits, rather than having to request audit authority on a case-by-case basis. It was now empowered to employ public accountants to make "periodic checks or audits of refiners' books and records in order to determine whether or not [the] Code is being observed" and "to call on any one or all members of the industry . . . for reports and statistics relating to . . . matters concerning which the Board is entitled to have information under this code."⁶⁷

These stronger powers were backed up with new sanctions for violations of the agreement, including nonreporting of statistics or failure to allow auditing. First, since the proposed AAA code included government licensing of all members of the industry, a violation could result in the revocation of a license. Second, the proposed AAA code was to be considered "a valid and binding contract," with violations of the code constituting a breach of contract and therefore making the violator liable for liquidated damages.⁶⁸ These sanctions replaced the, perhaps not credible, expulsion of a member refiner and the often-used blackballing of downstream firms under the Sugar Institute.

The secretary of agriculture rejected the proposed code on the grounds that it did not protect consumer interests sufficiently.⁶⁹ Delays in revising the proposed refiners' code later ensued because the secretary considered marketing agreements for raw sugar and beet sugar to be a higher priority. By July 1934 ASRC believed that the government would not enforce AAA codes,⁷⁰ and no other sugar refiners code was ever submitted under the AAA. Nevertheless, a code of fair competition for a united sugar association that was to encompass both beet and cane producers was drafted in 1935, and in August 1936, in the wake of the Supreme Court *Sugar Institute* decision, a proposed reorganization of the Sugar Institute was drawn up. The first agreement was silent on voting

67. *Weekly Statistical Sugar Trade Journal*, 31 August 1933, 359.

68. *Ibid.*, 359–60.

69. Placé Correspondence, letter to Manolo Rionda, 27 July 1934, and accompanying memo from Ellsworth Bunker, 24 July 1934.

70. Placé Correspondence, letter to Manolo Rionda, 20 July 1934.

rights; the second maintained the same system as the AAA code. Both draft agreements maintained the enhanced powers of the board of directors to obtain any statistics it required, with the sanction of liquidated damages (in the 1935 draft set at 25 cents per hundred pounds, or about one-half of per-unit variable profits, of the relevant quantity). One hears echoes of Placé's earlier call for "delegating positive power to some central authority" in the 1935 draft's anointing of the executive director as the "judge of violations."⁷¹

3.6 Conclusion

This chapter has been concerned with how refiners learned to ensure the exchange of information among themselves, and how they faced difficulties in inducing the sharing of certain types of information. Some surviving records of the McCahan Sugar Refining and Molasses Company provide a window into how the information that was exchanged was used at the firm level. In several letters to McCahan's president, Placé, who was responsible for all but production and raw sugar purchases at McCahan,⁷² uses institute figures to benchmark McCahan's practices or performance. For example, Placé points out that although McCahan's refined sugar stocks had increased from June 1930 to June 1931, institute figures revealed that its *proportion* of industry stocks had declined.⁷³ Industry statistics permitted a refiner to distinguish between change in conditions specific to the firm itself, and those common to the industry. In this case, the information helped allay any McCahan fears that it was losing sales to other firms through secret price concessions.

Benchmarking was applied to specific markets as well. Some institute figures were reported by states, and that information had never before been available. Due to the geographic dispersion of refiners, with overlapping market areas, the information broken down by state could be a great help to a firm in assessing its own performance. In another letter Placé argued that McCahan was not holding excessive stocks in Illinois because McCahan was selling 16.5 percent of all sugars there but only holding 8.9 percent of the stocks there.⁷⁴

Although perhaps unsurprising, such benchmarking is noteworthy as it is consistent with the models on the competitive effects of information sharing. In particular, information sharing increases the correlation of firm decisions because firms are acting upon common information. This correlation occurs even absent formal collusion by firms. Moreover, this benchmarking is related to a possible efficiency gain of information exchange, by reducing the chances of erroneous firm decisions based upon poor information. In the previous example, McCahan assessed its level of inventories based upon a comparison with other refiners. Absent the Sugar Institute, McCahan might have been led

71. Both agreements are to be found in Placé, Sugar Institute: Reorganization and Closing.

72. Testimony of Louis Placé, Transcript of Record, 2:827, District Court Record.

73. Placé Correspondence, Costs and Melts, 10 June 1931.

74. *Ibid.*, 22 July 1931.

to reduce its inventories below that of its competitors. If its competitors collectively had better information, then McCahan's independent decision to lower its inventories could hurt McCahan and market performance if stockouts occurred.⁷⁵

The enhanced information exchange achieved by the Sugar Institute did not survive it. Although firms could have shared information through the trade press even after the dissolution of the Sugar Institute, this did not occur. An examination of the *Weekly Statistical Sugar Trade Journal* for the years following the Supreme Court's decision shows that the dissemination of information had returned to the preinstitute state. Estimates of weekly deliveries and meltings are reported. But information on the weekly sales of refined sugar, one of the most elusive statistics, is nowhere to be seen. And there are no state-level data.

One's initial inclination is to classify the Sugar Institute as a failure. It could not avoid prosecution, which threat was one of the constraints of the economic, legal, and political environment in which the institute operated. Thus, in the end, the legal changes overshadowed any learning. The sugar refining industry did learn how to manage incentives within an information-sharing agreement, and more broadly, they learned the advantages such an organizational form offered in advancing industry aims, such as collusion. But the Supreme Court decision denied the industry that organizational form, at least as it was conceived and implemented. It was as if the industry had learned how to use a particular tool, and its value, and then that tool was taken away. Within the longer historical context, the changing legal and political treatment of trade-association activities first gave the sugar industry the opportunity to form and operate the institute, and then took away much of the institute's perceived power by limiting its activities.

Like a constitution, the code did not completely specify all future decisions; rather, it specified how those future decisions were to be made. Thus the Sugar Institute was at least a partial success because its structure enabled future decisions to be made that advanced the institute's original aims. In particular, the institute established a framework in which learning and adaptation could take place. First, the institute's organizational structure was sufficiently flexible to allow the institute and its requirements of members to change as members learned about the strengths and weaknesses of the original institute requirements. Second, the institute enabled firms to learn more about their market and their own performance through the information exchange that was accomplished under the institute's auspices. Third, although some of the lessons about organizing information exchange could not be put into practice due to political and legal constraints, those lessons were nevertheless learned.

75. This argument can be advanced without invoking stockouts. Since inventories serve to smooth production and thereby minimize costs, an inventory decision that turns out to be a mistake will result in higher costs of production.

Appendix

Code of Ethics of the Sugar Institute, Inc.

Among the purposes for which this Institute was formed were the following: To promote a high standard of business ethics in the industry; to eliminate trade abuses; to promote uniformity and certainty in business customs and practices; and to promote the service of the industry to the Public.

Accordingly, the organization of this Institute was a frank recognition, in and of itself, that customs and practices had grown up in the industry which were unsound and unbusinesslike, and which were harmful to producers and consumers alike. These customs and practices had resulted in confusion in the trade and discrimination as between purchasers, with a consequent uneven and uneconomic distribution of sugar to the public. The more important result to the industry was a demoralization and restriction of the retail trade in sugar and a retardation of the normal increase of consumption.

Believing that the trade will welcome a rectification of those business methods of the industry which have served to promote discrimination between purchasers; and believing that the public will be better served if the present channels of distribution are preserved and enlarged by maintaining equality of business opportunity among merchants of sugar; and believing that the members of the industry will recognize that it is in the interest of the industry to encourage and promote the wider distribution of its product to the end of increasing its consumption;

The Institute declares its policy to be founded upon, and recommends to its members the adoption of business methods in accordance with, the following principles, to wit:

1. All discriminations between customers should be abolished. To that end, sugar should be sold only upon open prices and terms publicly announced.
2. The business of the sugar refining industry is that of refining a raw product, the price of which to the industry is the controlling factor in the price which the industry receives for its own refined product; and the industry as a purchaser of raw sugar receives no concessions for quantity purchased. Concessions made by the industry for the quantity of refined sugar purchased have resulted in discrimination between customers, which discrimination the Institute believes it to be in the interest of the industry, of the trade and of the public to avoid. The Institute accordingly condemns as discriminatory, and in so far as this industry is concerned, as unbusinesslike, uneconomic and unsound, concessions made to purchasers on the basis of quantity purchased.
3. The following trade practices if not uniformly employed with all customers of a refiner are discriminatory. Furthermore, if not secretly employed they will of necessity be generally demanded, with the result that they must then be uniformly employed or abandoned. If uniformly employed they amount

to a general price concession which should frankly take the form of a price reduction. The Institute condemns them as unethical except when practiced openly; as discriminatory unless uniformly employed; and in any event as wasteful and unbusinesslike.

- a. Variations from the open and publicly announced prices and terms, including (but without limiting the generality of this clause) the following: Special allowances by way of discounts, brokerage, storage or advertising; variations from openly announced grade or package differentials; reduction or substitution of grades or packings; delayed billings; full discounts in cases of delayed payment; and rebates or other allowances by any name or of any nature.
 - b. Split billings, except on cars moving on an 80,000 lb. minimum and rate.
 - c. The use of differential rates on consignments, or otherwise than on direct shipments over differential routes at customers' request.
 - d. Payment of brokerage where any part thereof inures to the benefit of the purchaser.
 - e. Storage⁷⁶ of sugar in warehouses in which customers or brokers are interested, or with which they are in any way affiliated.
 - f. Allotments to brokers running beyond the close of business of the day on which an advance in price is announced by the refiner.
 - g. Special services to customers without appropriate charges therefor.
 - h. The sale of secondhand sugar by refiners.
 - i. Sales for export under contracts which do not provide for shipment out of the country.
4. The factors which enter into and determine the cost of his product for the refiner are so largely outside his control, and the probable margin of his profit so small, as to render highly speculative and unsound the giving by him of options to purchase his sugar. Furthermore, unless equally available to all customers alike, the giving of options is discriminatory. The Institute condemns the giving of options by refiners.
 5. In the interest of a more even distribution to the trade, the Institute recommends that sugar shall be consigned only to recognized detention points for reshipment, or to recognized markets and then in care of railroad or steamship lines or to public⁷⁷ warehouses, and that the control of the sugar shall remain with the refiner.
 6. The Institute recommends the use by members of uniform contracts to be adopted by the Institute for Eastern, Southern and Western markets.⁷⁸

76. Subparagraph e originally read "Storage of sugar in 'customers' warehouses" and was amended to read as printed above by resolution adopted 2 May 1929.

77. The words "or brokers," appearing before the word "warehouses," were stricken out by resolution adopted 2 May 1929.

78. The Code of Ethics is reproduced from *United States v. Sugar Institute*, 15 Fed. Sup. 817, 910-11 (1934).

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Comment Margaret Levenstein

David Genesove and Wallace Mullin's essay on the Sugar Institute makes an important contribution to our understanding of firm learning by focusing our attention on an important, but oft ignored, subject, the learning that firms do about organizational design. Most of us implicitly assume that the most important learning that firms undertake is learning about new technologies, with perhaps some passing concern given to learning about using existing technology (such as learning by doing). But the profitable adoption of new technologies often requires organizational innovation as well. Even when we do concern ourselves with organizational innovation, our first inclination is to follow Chandler (1977) and others, and focus on organizational innovation within the firm. But as Lamoreaux (1985) has shown, the profitable adoption of new technologies may also require organizational changes at the industry level as well. Firms actively try to shape industry structure through the design of interfirm organizations and interactions. But to do so successfully requires learning: learning about the other firms in the industry and learning about the sometimes less-than-obvious incentive properties of different interfirm organizations.

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The simplest and most obvious types of interfirm interaction are those intended to facilitate collusion, and collusion seems to have been the primary purpose of the Sugar Institute. Collusion is undoubtedly difficult to achieve. As Stigler (1964) and others have frequently emphasized, collusion is easily undermined by cheating. Many economists have presumed that the difficulties that firms face in colluding would force them to abandon the attempt. But in many industries firms have had a more imaginative response. They turn their creative capabilities toward experimentation with various collusive schemes, learning about the incentive properties of these schemes, learning about their legality, learning about the other firms in the industry as they observe responses to each new scheme.

The case of the Sugar Institute provides a useful example of the kinds of experimentation and learning firms undertake in an attempt to find a stable collusive arrangement. It also provides insight into the limits to the experimentation undertaken, the limits of the learning that sugar firms did during this period. The Sugar Institute's learning was constrained by its own "mental model" of the sugar industry, by its own implicit model of how to respond to problems of excess capacity and falling prices. Genesove and Mullin suggest that the 1887 consolidation of the industry was a critical learning experience for the industry. Following Havemeyer's creation of the Sugar Trust, sugar firms formed a mental model of their own industry. That model suggested that *the* best way to respond to excess capacity and falling prices was consolidation. When it became clear that that solution was prohibited by antitrust law, sugar firms turned to the next best thing. They looked to close coordination that would, as nearly as possible, allow them to replicate consolidation.

Thus we can see that learning does not take place as a smooth or continuous process. Rather there are critical moments when a mental model is formed, and without a "paradigmatic shift," future learning takes place within that mental model (Kuhn 1970). What is striking about the case of the sugar industry is that, during the period covered in this paper, neither episodes of competition nor episodes of cooperation appear to have provided the basis for a paradigmatic shift that would have allowed sugar firms to develop a new mental model. Such a model might have encouraged them to focus their energy on other cooperative tools or strategies as the basis for an increase in profits.

While a different mental model might have led the Sugar Institute to direct more of its energies toward learning about technological change, advertising, and product development, the learning that the members of the institute did seems to have been strictly incremental modifications of their existing "mental model." Their experience with interfirm organization led to no radical or paradigmatic shift in their understanding of how to protect their profit margins. Within that context, however, they do seem to have learned about one another, and about the incentive properties of various institutional forms with which the institute experimented.

The Sugar Institute experimented with a variety of tools to support collu-

sion. Probably the single most important tool was the public announcement of prices. Like other industries adopting the popular "open-pricing" schemes of the period, the sugar firms hoped that publicly announced prices would prove focal, dulling price competition without explicit price setting. But the institute did not rest with one simple tool.

The institute tried to eliminate mechanisms through which secret price cuts could be given. The institute rules banned rebates and special allowances on transportation charges and limited contract duration to a maximum of thirty days. And it banned vertical integration into certain aspects of sugar distribution. These rules then required that the institute collect information regarding members' compliance with them. So it had to learn which information would be necessary to determine compliance. It began by asking for regular reporting of information about vertical relationships, then turned to special investigations on an ad hoc basis. Initially these special investigations were undertaken by an institute investigator, but when firms resisted providing information to him, the institute began to use third-party auditors, like Haskins and Sells, to collect the necessary information.

The institute's most ambitious, but apparently least successful, scheme called for the reporting of all sales. While the institute was legally prohibited from setting output quotas or market shares, sugar firms seem to have had an idea of the share of industry output to which any firm was entitled. If the Sugar Institute could compute and report total sales in any period, individual firms could calculate their market share and use that as an indicator of cheating (as in Green and Porter 1984). While the institute tried a variety of schemes to induce disclosure of sales, and certainly learned something in the process, in the end it did not succeed in making this particular tool workable.

The institute members learned to make information sharing self-enforcing, at least some of the time, by using an exclusionary disclosure rule in which only those who provided information received reports from the institute. The institute adopted this policy after months of attempting to use "moral suasion" to convince member firms that it was in their individual interest to reveal information to the institute. When the institute learned that it could not, given the necessary weakness of its organizational structure, provide all firms with sufficient incentives to report the requested information, it tried other tactics. Exclusionary disclosure was a more credible threat than expulsion, which the institute threatened but was never willing to implement. Expulsion from the institute would have harmed the remaining members as much as the ostracized firm. Because it was clear that such a threat would never be implemented, it, as we would expect, had no effect on firm decision making.

The institute also experimented with the creation of a more centralized organizational form. Two years after the institute was founded, it created the Enforcement Committee. Even the Enforcement Committee's decisions had to be incentive compatible, as participation in the institute was voluntary. But providing an "explicit institutional structure" for resolving members' refusals to

comply with requests for information, Genesove and Mullin tell us, changed incentives sufficiently to induce the reporting of information. Perhaps the public precommitments of members to support the committee changed the incentives of member firms. The precommitment itself created a new punishment, since firms had put up their promise as bond. The use of such a technique reflects learning, or at least experimentation, on the part of member firms with tools to influence the incentives of the institute members.

The decision to create the Enforcement Committee reflects continued experimentation by institute members with the overall design of their industry association. While their choices regarding the design of the association were limited by antitrust law, they did learn from the experience in the institute enough about one another to understand that a different voting mechanism might have been able to achieve more satisfactory results. The institute tried repeatedly to create a decision mechanism in which individual firms ceded their veto power to the institute, but given the legal structure under which the institute operated, simple centralization was destined to fail. We can observe further organizational learning in this area by comparing the operations of the institute to the industry code that it proposed under the Agricultural Adjustment Act. Some of the differences between the two undoubtedly reflect the dramatic changes in both the macroeconomy and the regulatory environment in the intervening years. But the differences in the proposed codes in 1934 and the design of the Sugar Institute in 1926 suggest that member firms had learned, and were using the new opportunity and the new environment to put into effect changes that they had learned would allow them to better achieve their goals. Sugar firms understood that the lack of power to impose sanctions limited the effectiveness of the institute. They hoped to solve the problem with tools made available in the new legal environment, which allowed them to propose a code with strong sanctions.

The new code also changed voting procedures, giving greater weight to large firms. Again, this suggests learning about the internal political dynamics of their own industry. Codes adopted in other industries at the same time tried to protect the interests of small and medium-sized firms with a one-firm, one-vote rule at the same time that the sugar industry, having learned the futility of such a system, appears to have abandoned it in favor of one reflecting the political realities of the industry. The new code also centralized decision making in the board to a greater degree than under the institute rules. Again, this was not something obviously required or induced by changes in external conditions, but rather reflects learning and continued experimentation by industry participants. Whether such a voting rule would have allowed implementation of an incentive scheme that would have induced further information sharing we will never know, but it was another, creative attempt to achieve those long-standing objectives.

What do we learn about the feasibility of collusion from Genesove and Mullin's story? They argue that implicit collusion was successful, but also that the

institute was not able to achieve information sharing that one might well think crucial to collusive success. So we must ask, did the inability to share sales information have any impact on collusion? Or should we revise our ideas about how much or what kinds of information firms need to have to collude?

There are other, important types of interfirm interaction often pursued by industry associations. These include attempts to increase demand for the industry's product through advertising, standardization, and regulation of product quality. They also include attempts to improve production efficiency by improving the information that firms have about fluctuations in demand and sharing information about, or even jointly engaging in, technological innovation. As becomes clear in Genesove and Mullin's paper, the collusive and efficiency-enhancing functions of interfirm organizations are not mutually exclusive. And in their story we observe experimentation with organizational design to better achieve both types of objectives. Genesove and Mullin suggest that information sharing helped to rationalize production and economize on inventory carrying costs by allowing firms to estimate demand more accurately. They also suggest that firms used shared information as a benchmark to evaluate their own employees' success at marketing sugar and perhaps the company's own market strategy. However, the "mental model" of the industry held by the institute and its member firms seems to have led them to downplay the importance of these other activities—except when questioned by the antitrust authorities. In fact, in the case of advertising, Genesove and Mullin suggest that rather than learn how to achieve cooperative outcomes, firms learned about the limits of the usefulness of sharing information and resources. While Genesove and Mullin's description is brief, the advertising activities of the institute look quite beneficial to the industry. But these benefits were captured almost completely by the largest firms. Smaller firms learned that they were getting taxed to pay for advertising that primarily benefited larger firms, and after eight years they opted out. Advertising was not enough of a priority to the institute to experiment with different structures that might have allowed these activities to continue.

The decision to abandon the institute in 1936, when it became clear that antitrust law would limit its ability to facilitate collusion, suggests that members' mental model of the industry, and the role of an industry association in their model, had changed little over the previous nine years. There seems to have been no appreciation of the potential importance of the association as a repository of shared experience. One of the difficulties of interfirm learning is that there is not necessarily a good "home" for the learning that takes place. The institute itself provided such a home for a short period, but it did not have the longevity necessary to provide a long-term resting place, where knowledge could be stored, accumulated, synthesized over time as the external environment changed.

Institute members also never seem to have explored its potential as an agent or repository of learning about technological change. Genesove and Mullin

report that there was no significant technological change between the Sugar Trust and the Sugar Institute. Was this because the possibilities for innovation were not there? Or because the collusive structure of the industry diminished the incentives for, or even impeded, technological change? Is there any evidence that information exchanged through the Sugar Institute increased productivity in sugar, say by smoothing production or cutting inventory costs? Was this a complement or a substitute for other kinds of productivity-enhancing technological change? This particular case cannot answer these questions, but it does remind us that learning is not always Progress.

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