1 The Cartel Ideal

In the fifty years before World War II, the world backed away from the idea that economic competition necessarily promoted the common good. The retreat, although gradual at first, became headlong with the outbreak of World War I in 1914. Among the chief manifestations of this trend was the expansion of cartels, which played an ever-growing role in domestic and international trade and by 1939 had become a major factor in the world economy.

Cartels in Theory

Between the world wars, business executives, government officials, and intellectuals increasingly argued that competing firms ought to work together in cartels, cooperating to stabilize markets and plan for the future. These organizations would ideally replace the "every man for himself" ethos of competition with cooperation for the common good and would cover not only national but international markets.

Cartels, strictly defined, are formal agreements among independent firms to restrict competition. Cartels usually set prices, allocate markets, and provide for ongoing consultation among signatories. These organizations are commonly the product of hard times, created when industries face excess capacity or falling demand; however, cartels created during economic downturns often survive after the return of prosperity either out of habit or as insurance against future difficulties.

Although collusion among businesses is no doubt as old as trade itself,[1] cartels did not appear in their modern form until the last quarter of the nineteenth century. At that time, prices for almost all goods were falling sharply throughout the world, and firms in many countries organized cartels to resist the drop.[2] The tendency was perhaps strongest in Germany, where, as one historian put it, "there was no Smithian belief in an invisible hand, guiding individual economic actions so that their total sum coincides with the best national interest. The optimal allocation of resources was a moral matter as much as a technical one."[3] In 1897, the German Imperial Court ruled, "If prices continue to remain so low that economic ruin threatens entrepreneurs, their union [in cartels] appears not merely as a rightful exercise of self-preservation, but rather as a measure of serving the interests of the whole as well."[4] Germans had no monopoly on enthusiasm for cartels, however, and before 1914, every industrial country had at least a few.

Some cases of these organizations spanned national borders. Many scholars have argued that, at least initially, nationalism held cartels together—firms cooperated at home to compete more effectively abroad.[5] Yet the logic that drove competitors within a national market to organize cartels also applied to companies operating internationally. When strong firms confronted one another across national boundaries, they often decided to cooperate rather than engage in costly and, quite likely, inconclusive economic warfare. Before 1914, effective international cartels existed in the steel rail (for railways), explosive, and synthetic alkali industries, among other sectors.[6]

Between the world wars, economic and political conditions pushed an unprecedented number of firms into international cartels.[7] In the early 1920s, all the industrial countries suffered from some combination of high inflation and severe recession, and the 1930s were remarkable chiefly for the Great Depression, which crippled the world economy. Even the prosperity of the late 1920s was uneven. The rapid growth of firms making new products like automobiles, radios, and rayon buoyed most economies, but older industries such as railroads, shipbuilding, textiles, and coal mining were depressed, as was agriculture as a whole; workers and companies in those fields did not share in the general abundance. In Britain, for instance, unemployment never fell much below 10 percent during the late 1920s, largely because of depressed conditions in older sectors.[8]

Many of these difficulties originated during World War I, which had wrecked the economic equilibrium of the early twentieth century. During that conflict, many industries, responding to military demand, had expanded capacity far beyond what peacetime markets could absorb. This problem was particularly severe in "heavy industries" such as metals, machinery, and chemicals. The war had also choked off foreign trade and disrupted established channels of exchange. The British blockade had isolated German firms producing chemicals, electrical machinery, and steel from their overseas export markets, and during the four years of fighting, new firms located in Allied or neutral countries had filled the void. With peace, the Germans were determined to recapture lost markets. The interlopers, often backed by their governments, were determined to hold on—a situation that promised savage competition. Nor was the German experience unique. Because of shortages of shipping, raw materials, and manpower, Britain's huge textile industry lost many of its foreign markets during the war, mainly to Japanese and Indian producers. After 1918, British firms tried to regain lost sales, but they generally failed, leaving idle the textile mills that had stopped work during the war. These distortions all entailed overproduction, which cartels could address by restricting output and allocating markets.

The Great War also destabilized currencies. Before 1914, international finance revolved around the gold standard. In the industrial countries, governments stood ready to redeem their currency in gold on demand at a fixed rate, which allowed for easy conversion of the money of one nation into that of another. With the uncertainties of foreign exchange eliminated, international trade and investment were much simpler. The exigencies of military finance quickly wrecked the system. Unable to pay the staggering expense of war either by raising taxes or by conventional borrowing, governments began to print money, unleashing inflation that soon forced them to sever the link between their currencies and gold. After 1918, the heavy reparations bill imposed on Germany and the tangle of war debts among the victorious Allies put a strain on financial exchanges that made resumption of the gold standard difficult at best. A concerted effort to stabilize currencies did provide a few years of order in the late 1920s, but the Depression soon sabotaged the effort. Severe deflation and financial panics forced governments to abandon fixed exchange rates. Instead, they began to manipulate their currencies to further recovery, usually at the expense of their trading partners. The most common tactic was devaluation, which, by cheapening exports and raising the price of imports, improved a country's competitive position. Some governments went further. In the midst of crisis, authorities in several nations, particularly in central Europe, imposed currency controls that, when the panic was over, they retained and managed shamelessly for their own ends. The Nazi regime in Germany was particularly notorious for not allowing foreign firms to repatriate profits, forcing them to reinvest the money in Germany.[9]

The situation vastly increased the risks associated with foreign trade. Even if customers paid their bills on time and in full, no firm could be sure exactly what the money it received abroad might be worth at home, or if it could repatriate its earnings at all. A devaluation could suddenly change a profitable export market into an unremunerative one and ruin the work of years. The very possibility of financial instability made planning difficult. Such uncertainty inclined firms to attempt to reduce risks in other areas, something effective cartels might accomplish.

The treaties ending the Great War added other difficulties. The Treaty of Versailles transferred Alsace-Lorraine from Germany to France, and with it much of Germany's pig iron capacity. Previously the output of Alsace-Lorraine's blast furnaces had gone to rolling mills in the Ruhr Valley, but after 1919 an international border stood in the way. Logically, some sort of cooperative arrangement between France and Germany would have been in order, but war-inspired bitterness and economic chaos in Germany after 1918 made such a solution impossible. Instead, the Germans built new blast furnaces and the French new rolling mills, further exacerbating the oversupply of steel.[10] Conditions in eastern Europe were worse. There a group of small states emerged in what had been the Austro-Hungarian Empire and the western reaches of the Russian Empire, and each of these countries was intent on building up its own industry, preferably at the expense of its neighbors. In Russia itself, the Bolshevik regime tightly controlled foreign trade. Producers who before 1918 had sold throughout the old empires found themselves excluded from their traditional markets by prohibitive tariffs and other restrictions.

Almost every nation raised protective barriers during the 1920s and 1930s, putting further strain on a system of international trade already severely damaged by war. Even Britain abandoned its long-standing policy of free trade and imposed a protective tariff. To a large degree, this reflected hard times. Many governments had traditionally increased tariffs during downturns to insulate domestic producers from foreign competition; the unprecedented difficulties of the interwar years encouraged nations to raise barriers to new highs. The experience of the Great War had also strengthened the protective impulse. The conflict had demonstrated unambiguously the importance of manufacturing to national defense; military considerations led government after government to protect "strategic" industries, a tendency that became particularly strong in the 1930s, as the ambitions of Germany, Italy, and Japan made war seem ever more likely. One example of the consequences was the glut in synthetic nitrates throughout the 1930s. Though used chiefly in fertilizers, nitrates were an indispensable ingredient for military explosives, a fact that led almost every European country to use tariffs and subsidies to protect its own suppliers regardless of overall market conditions.[11]

The contraction of foreign markets encouraged exporters from different countries to join together. In part, they hoped to avoid destructive competition for shrinking opportunities. Perhaps even more important, they wanted to negotiate market-sharing arrangements with domestic producers in importing countries, thereby forestalling protectionist measures that might shut out foreign sellers altogether. The steel cartel negotiated agreements with producers in importing countries to apportion local markets, and the nitrates cartel not only fashioned such accords but actually established a fund to pay national competitors to adhere to them.[12]

The world's governments adopted no common program to stabilize currencies, reduce protection, or otherwise revive the international economy. To a degree, the failure reflected the distrust carried over from World War I and was exacerbated in the 1930s by the rise of fascist regimes bent on national aggrandizement. Perhaps even more important, however, leadership was lacking. Though Britain had traditionally coordinated efforts to keep international trade and finance stable and growing, the war had weakened the United Kingdom. The effort to reestablish the value of sterling and pay off war debts to the United States absorbed British attention and wealth throughout the 1920s, and the Depression forced the abandonment of even these limited goals in 1931.

Only the United States had the resources to take Britain's place, but its people were reluctant. Unlike subjects of the United Kingdom, who for centuries had seen international trade as the avenue to prosperity, Americans had traditionally looked inward to the development of their own vast nation. Many Americans believed that their country could effectively isolate itself from economic turmoil abroad. Such opinions were not universal: American agriculture depended heavily on foreign markets, and many industrial firms and banks had substantial interests in other countries. Nevertheless, isolationist sentiments conditioned Washington's forays abroad. It consistently refused to write off debts that its Allies had incurred during World War I. In 1924, the U.S. government brokered an agreement that stabilized German finances. Subsequently, American bankers extended credits to European governments and businesses to facilitate reconstruction. But the United States also raised tariffs in 1921 and 1922, despite a large trade surplus, making it difficult for the rest of the world to earn the dollars needed to service debts to the United States.[13] In 1931, as the Depression deepened, President Herbert Hoover placed a moratorium on the payment of intergovernmental obligations, effectively suspending the problems of German reparations and Allied war debts. Yet at the same time, Hoover signed the notorious Hawley-Smoot tariff, which raised duties still higher, often to prohibitive levels.

The first administration of Franklin Roosevelt did no better. Its only major initiative in the international sphere was to wreck the London Economic Conference, which had convened to stabilize the world's currencies. The president feared that it might conflict with his plans for domestic reform, which included devaluation and inflation. The series of bilateral trade agreements subsequently negotiated by Secretary of State Cordell Hull, though useful, did not constitute a general solution to the problems of the international economy. Although not unmindful of problems abroad, the United States refused to make substantial sacrifices—tariff reductions or financial aid—to revive foreign economies.[14]

International cartels filled part of the vacuum left by government inaction. The world's economic problems were beyond the power of any individual firm or even most national cartels. Yet before 1914, international cartels had operated successfully in several lines of business—steel rails, synthetic alkali, explosives—setting prices and allocating markets. In the 1920s and 1930s, many businessmen seized on this proven technique to impose order on their industries and to insulate themselves, as much as possible, from the risks of operating in a disturbed world.

The enthusiasm for cartels reflected more than the desire of business to protect itself from hard times, however. Many in academia and government believed that cartels were a "higher" form of economic organization that replaced the brutal ethos of competition with a system of cooperation. This sentiment gained strength from the vogue for economic planning between the world wars. As one historian of the New Deal noted, "That humanity could and must manipulate its social as well as its natural environment, and do so rationally and collectively, had been the central message of leading social theorists since the late nineteenth century."[15] Still, fears of centralized regimentation tempered much of the enthusiasm for planning. The words of one commentator on the American business scene in 1931 applied throughout the industrial world: "Moderate and liberal opinion . . . believes in a *decentralized* method of voluntary agreement for cooperation using an absolute minimum of regulation, politics, or coercion."[16]

Cartels met these criteria. As one expert put it, they promised to be "efficient instruments for superseding the 'anarchical' state of competition within the limits of the capitalist economy, and for safeguarding small and middle-sized enterprises against being overwhelmed by the competitive power of large concerns. They are, moreover, regarded by some of their supporters as important means of smoothing out the ups and downs of general business conditions."[17] In a speech before the House of Lords in 1944, Lord Harry McGowan, the chairman of Imperial Chemical Industries (ICI) of Britain, stated, "Such agreements [cartels] can lead to a more ordered organization of production and can check wasteful and excessive competition. They can help to stabilize prices at a reasonable level. . . . They can lead to a rapid improvement in techniques and a reduction in cost, which in turn, with enlightened administration of industry, can provide a basis of lower prices to consumers. They can spread the benefits of inventions from one country to another by exchanging research results, by the cross-licensing of patents, and by the provision of important 'know-how' in the working of these patents."[18] Many government officials hoped that cartels would coordinate the modernization of chaotic and often antiquated industries. Stanley Baldwin, the prime minister of Great Britain, commented soon after his country's none-too-efficient steel makers joined the international steel cartel in 1935, "I make bold to say that in four or five years the [British] steel industry will be second to no steel industry in the whole world."[19]

Some observers even saw international cartels as the basis for a new world order, offering an institutional framework for cooperation that bypassed governments, which were often hamstrung by ancient rivalries and petty squabbling. In the 1920s, a German economist wrote that international cartels "are expected to help to bridge over the enmities created or inflamed by the War or at least to mitigate their disastrous influence upon the economy of the different nations and on the world economic order."[20] French premier Edouard Herriot argued in his book *The United States of Europe*, "The [international] cartel is a sign of progress, uniting national economies which were previously hostile."[21]

The League of Nations, though more cautious than Herriot, also endorsed cartels. The authors of the final report of the league's World Economic Conference of 1927 noted that "in certain branches of production they [cartels] can—subject to certain conditions and reservations—on the one hand, secure a more methodical organization of production and a reduction in costs by means of a better utilization of existing equipment, the development on more suitable lines of new plant, and a more rational grouping of undertakings, and, on the other hand, act as a check on economic competition and the evils resulting from the fluctuation in industrial activity." The report did, however, warn that cartels might exploit consumers. It went on: "They cannot be regarded as a form of organization which could by itself alone remove the causes of the troubles from which the economic life of the world and particularly of Europe is suffering."[22]

Between the world wars, most governments encouraged the growth of cartels. In some countries these organizations had always enjoyed support, but in other nations this attitude represented a substantial change. Before 1914, British courts had refused to enforce cartel accords, permitting companies both to sign agreements and to break them at will. Starting in the 1920s, the courts began to enforce the "reasonable" provisions of cartel accords—and in practice, judges found few provisions unreasonable. The new approach brought British law close to that of Germany, where cartel agreements had the force of contracts. Elected authorities in Britain also abandoned laissez-faire and encouraged depressed industries like textiles and steel to organize "rationalization" cartels to shut obsolete plants and coordinate pricing and sales.[23] Governments around the world actually organized some international cartels themselves, most notably for sugar, rubber, and wheat.[24] As one historian wrote, "In the interwar period general acceptance of cartels was very high; such views were shared throughout the world."[25]

The Düsseldorf Agreement of 1939 exemplified the hopes invested in international cartels as well as their limits. The accord, signed on March 16 in Düsseldorf by the German Reichsgruppe Industrie and the Federation of British Industry, declared, "It is essential to replace destructive competition wherever it may be found by constructive cooperation, designed to foster the expansion of world trade." To this end, "the two organizations have agreed to use their best endeavors to promote and foster negotiations between individual industries in their respective countries." The agreement called for the creation of a joint standing committee to encourage and mediate cartel talks.[26] The participants no doubt hoped to lay the foundation for a system of international economic cooperation. Unfortunately, the German government had no interest in such plans. On March 16, Adolf Hitler sent the German Army to occupy what remained of Czechoslovakia, heightening international tensions and leading the British to renounce the Düsseldorf accord. Six months, later Britain and Germany were at war.[27]

Nevertheless, an air of inevitability surrounded the growth of cartels. Alfred Mond, Lord Melchert, the first chairman of Imperial Chemical, spoke for many when he said, "The trend of all modern industries is towards greater units, greater coordination for more effective use of resources. . . . One of the main consequences is the creation of inter-relations among industries which most seriously affect the economic policies of nations."[28]

International Cartels in Practice

Between the world wars, many industries organized effective international cartels. The process was rarely easy. Each industry had unique requirements, and perhaps more important, leading participants had to develop mutual trust. Nevertheless, by 1939, international cartels were a major force in the world economy.

International cartels represented one of the most ambitious undertakings in economic history. Because cartels seek to establish cooperation among traditional rivals, their enthusiasts often liken them to treaties between nations. Certainly the difficulty of negotiating and implementing cartel accords equals that of the most complex government agreements. Bringing commercial rivals together in a system of cooperation demands great diplomatic talent. Though cartels hold out sizable advantages to participants, they also entail significant short-run costs. Cartels seek first and foremost to stabilize prices, which forces them to limit sales during downturns either by idling production or by stockpiling output. Under these conditions, member firms have a strong incentive to cheat. A company that cuts prices and expands sales while other firms restrict output and keep charges up will gain market share and earn substantial profits at the expense of its cartel partners. To be sure, this will eventually wreck the cartel, as sooner or later the other members will find out what is going on and retaliate. But firms often tolerate this. They may be under financial pressure (falling sales) and not have the luxury of planning for the long term; their managers may not trust their cartel partners and decide to strike the first blow; or firms may simply decide to seize quick profits rather than wait for incalculable benefits at some future date.[29] Yet even if a cartel does prevent cheating and stabilize the market, its success may induce outsiders to enter the business, undermining the organization.

Many economists consider cartels inherently unstable. As one textbook put it, "Collusive agreements tend to break down," largely because of the incentive to cheat.[30] The author of a scholarly article on cartels observed, "If one member cheats, the other is better off cheating than observing the quota. Since the other is better off cheating even when the one observes the quota, it appears that cheating dominates observing the quota."[31] In other words, dishonesty is the safest and therefore most likely course.

This argument ignores the success of many cartels over extended periods. The steel rail cartel lasted from the 1880s to World War II; some chemical cartels survived almost as long. Several factors explain this success. Before 1945, in Germany and several other countries, cartel agreements had the status of contracts, which meant that cheaters faced legal sanctions. Firms were also adept at cloaking domestic and even international cartels in the guise of patent agreements, the violation of which also entailed considerable legal risks. Governments often organized cartels themselves, or at least endorsed them, and few companies were willing to flaunt the desires of political authorities.

Yet cartels can endure even without the support of law. Cheating on a cartel agreement yields profit only if it proceeds undetected, because once the other cartel members learn what is going on they will retaliate. Accords often contain provisions for careful market monitoring, usually through an autonomous agency, to detect violations and permit quick action against cheaters. Such provisions encourage members to abide by their promises. As one economist put it, "Once detected, the deviations [cheating] will tend to disappear because they are no longer secret and will be matched by fellow conspirators [cartel members]."[32] Even if a firm gets away with cheating for a while, the inevitable retaliation may discourage such action in the future. The resurgence of competition will hurt everyone and re-create the situation that encouraged the formation of a cartel in the first place, which in turn may lead to the creation of a new cartel. This time, however, with the example of retaliation fresh in their minds, participants are less likely to cheat. As one economist argued, "If a market situation is repeated for an infinite number of periods, it is possible that an industry will settle at a cartel price, and the reason why each firm does not defect from the implicit cartel agreement is the future losses that it will incur when competitors retaliate."[33]

Nor do cartels inevitably attract outside challengers. Significant barriers to entry exist in many industries. Efficient production often involves economies of scale that require large capital investment, and sometimes patents cover vital technology. Such obstacles are rarely insurmountable, but they substantially increase the risks of challenging a cartel. Much depends on the cartel's policy. As one expert noted, "The more the cartel exploits its monopolistic position to exact higher prices—and thus giving a strong stimulus to new enterprises—the greater prospect there is of the latent competition becoming reality." But "they [cartels] may be used not to increase the profits of their members but to keep them from falling below a certain level—a thing which may easily happen in open competition."[34] In the latter circumstance, the incentives for outsiders to enter the industry are much weaker, often insufficient to compensate for the risk of doing so. As one economist put it, "To recognize that a cartel might collapse because it cannot control external production or detect cheating is quite different from believing that all are necessarily doomed. . . . No general prediction about the durability of cartels is justified."[35]

Effective cartels did not develop in every industry. Some industries, like textiles, contained too many producers to organize. In consumer goods industries like cigarettes, soap, and candy, firms defended themselves against the vagaries of the market by using advertising and other promotional techniques to build up brand loyalty among consumers. International cartels between the world wars generally fell into one of three broad categories: market-sharing agreements in industries dominated by a few large firms producing undifferentiated commodities; accords organized around the exchange of technology; and government-sponsored cartels.

The international steel organization, an example of the first of these three types, enjoyed perhaps greater influence and notoriety than any other cartel.[36] The largest of the heavy industries in terms of capital and labor employed as well as the value of output, steel was particularly suited to cartelization. Its products differed little from producer to producer, and all manufacturers had ready access to the most advanced technology. The efficient production of steel required substantial investment, which limited the number of firms in the business to a level where negotiations were manageable. At the same time, their substantial capitalization made steel makers particularly eager for stable prices that would allow them to pay the interest on their debts and dividends to stockholders.

Steel producers organized their first comprehensive international cartel in the 1920s. Even before 1914, national cartels such as Germany's had established themselves as leading factors in the business, and international cartels had governed specific areas like steel rails. Postwar conditions, however, involved difficulties beyond the power of these organizations. The oversupply of steel after World War I affected all of Europe, depressing employment and prices and squeezing the profits of steel makers. In 1926, producers in Germany, France, Belgium, Luxembourg, and the Saar organized a cartel that consisted not of individual firms but of each country's national steel makers' organization.[37] The cartel claimed only about one-third of world steel capacity but accounted for approximately two-thirds of the world's steel exports and covered many of the most efficient firms competing in international markets. Ostensibly intended to govern only exports, the cartel in fact set output quotas for each member, levying fines on national organizations that exceeded their quotas and providing rebates to countries that fell short. An office in Luxembourg overseen by representatives of the various national cartels kept track of the market for steel, administering the system of fines and rebates.

This organization did not survive the Depression. The cartel had a program beyond its capabilities. Though it aimed to control total output, the cartel lacked the resources to monitor the activities of dozens of companies in member countries. Moreover, it was supposed to operate through the national bodies, but the French and Belgian steel makers' organizations could not control their members, which violated the accord at will. The advent of the Depression and the consequent drop in demand for steel required the cartel to reduce output sharply to maintain prices, which it failed to do. Instead, producers cut prices and poached customers from one another to try and keep their works operating at capacity. By 1931, steel makers had abandoned the cartel.

The steel cartel re-formed in 1933. Business was absolutely terrible, and steel makers had reason to think that an effective cartel might help. The prices of products traded in the world markets had declined precipitously: merchant bars went from £6 a ton in 1929 to £2 in 1933, and structural shapes and billets both dropped from £5 a ton to £2. By comparison, steel rails, a part of the business governed by a cartel established in the 1880s, had fallen hardly at all: from a high of £6 10s a ton in 1929, to £5 10s in 1933. Because the British government had devalued sterling by about 15 percent over this period and traders continued to calculate prices in gold (pre-devaluation) pounds, the cash actually earned from sales had barely changed at all.[38] The materials for constructing a cartel were also stronger. The Belgian and French steel makers' associations now enjoyed greater control over members, thanks largely to the support of their governments and bankers. The former desired stability in this central industry, whereas the latter, who financed the growing deficits of steel makers, feared that without a plan for cooperation steel firms would never repay their debts. Together they forced firms to follow the dictates of the cartel.[39]

The new cartel included the same members as the old—Germany, France, Belgium, the Saar, and Luxembourg—but it combined more limited objectives with a much stronger organization. The cartel gave each group of producers exclusive rights to its home market as well as an export quota enforced by the familiar system of fines and rebates. Once again, a small staff in Luxembourg kept track of sales and administered the fines and rebates. But the general export quotas merely represented a stopgap measure. Plans called for the creation of "comptoirs," sub-cartels for each steel product such as wire rods and galvanized sheets. These would not simply set quotas for sales but, ideally, organize the export trade. The new steel organization quickly brought under its umbrella older, product-specific organizations such as that for steel rails and had by 1939 erected thirteen new comptoirs, which together dominated the world trade in steel. All the comptoirs had staffs that operated like the main organization, keeping track of sales and assessing fines and rebates. In some cases, such as the venerable steel rail cartel, the comptoir itself managed sales, taking orders and allocating them among members. Ideally, all the comptoirs would develop such capabilities, which would reduce costs by merging and rationalizing marketing networks, as well as make it very difficult for members, now shorn of their foreign outlets, to cheat. Only a few comptoirs had reached this level by 1939, however.

The steel organization expanded rapidly. British producers joined in 1935. Originally the United Kingdom had remained outside the cartel both because its national steel makers' organization was quite weak and because continental producers considered its firms inefficient and hence little threat to their plans. To the extent that the British did export, their steel went to Commonwealth markets, where it did not compete with European products. British steel makers developed a strong organization in the 1930s, however, largely because of pressure from the government and the Bank of England. By this time, the United Kingdom had become a major importer of steel, a development London used to its advantage. In early 1935, Whitehall imposed a prohibitive tariff on imported steel, designed to force the cartel to come to terms with British producers. The tactic worked. British steel makers soon signed an accord with the cartel limiting imports to Britain and granting them export quotas, after which Whitehall immediately scaled back the tariff. By this time, the cartel had already signed agreements with Polish, Czech, and Austrian producers, bringing continental Europe's major steel exporters into its fold.[40] In cases such as South Africa, where strong domestic producers existed within a major import market, the cartel negotiated accords to divide local business with these firms. Such arrangements guaranteed stable prices and market share for all while eliminating both the dangers of foreign dumping (sales at below market prices) and the threat of prohibitive tariffs imposed by national governments to defend the home industry.

Next the cartel sought the cooperation of American steel makers. Although the United States was both the largest producer and the largest consumer of steel, its market was insulated from the rest of the world. Imports and exports accounted for only 1.6 and 3.6 percent, respectively, of total U.S. output in 1936, a fairly typical year.[41] American steel makers were technically quite efficient, but high labor and transportation costs made it difficult for them to compete in world markets. They concentrated on sales at home, where in the 1920s, strong demand and a high tariff guaranteed good prices.

The Depression changed matters. Unable to run their large works at anywhere near capacity, American producers saw their unit costs escalate.[42] This both left them more vulnerable to foreign competition and led them to look to export markets as a way to occupy at least part of their idle plants. Producers on both sides of the Atlantic had good reason to negotiate. First, however, the U.S. companies had to get around the American antitrust laws, which banned cartels. They did this by working through a Webb-Pomerene company, a type of organization authorized by Congress in the Webb-Pomerene Act of 1918 that allowed U.S. firms to cooperate in export markets. According to prevailing interpretations of the law, Webb-Pomerene companies could participate in cartel accords as long as they dealt only with markets abroad.[43] American steel makers united under the aegis of a Webb-Pomerene company and began negotiations. The talks took quite a while, in part because the cartel gave priority to discussions with European producers. The two sides finally signed an agreement in 1938, granting the Americans export quotas and—though the written accord said nothing of this—limiting shipments to the United States.[44]

As far as members were concerned, the steel cartel worked well. In 1933, prices on the international market quickly rose and then stabilized for the next three years. Merchant bars and structural shapes increased from £2 a ton to £3 (50 percent), and billets went from £2 a ton to £2 16s (40 percent). Steel prices briefly went up in the world boom of 1936 and 1937 and gave back some of their gains in the subsequent recession, although they remained above their 1933 to 1936 level for the rest of the decade.[45] Moreover, as the world economy gradually improved and producers were able to use their facilities more fully, profits increased substantially.

Consumers had a more ambiguous experience. The cartel raised prices, but its partisans insisted that the organization moderated both upward and downward swings in the market. Ideally cartels were supposed to keep prices from rising too high—as well as from sinking too low—because high prices and the inordinate profits they brought attracted outside competitors who destabilized markets. The extraordinary stability of steel prices from 1934 to 1936 suggests that the steel organization did indeed pursue such a policy. As Ervin Hexner, the historian of the cartel, remarked, "It did not abuse economic power, concentrated in private hands, by creating general artificial scarcity in steel supplies, nor did it use concerted business strategy to increase its returns substantially over returns from domestic sales in steel-exporting countries."[46]

This conclusion ignored the cartel's impact on prices within members countries. Except for Belgium and Luxembourg, all the steel-making nations consumed far more steel at home than they exported. Many producers viewed foreign sales chiefly as a way to keep their plants operating at capacity and so reduce unit costs, not as a source of profits. By granting members sole rights to their home markets, the cartel allowed producers freedom to set prices for their most important customers. In some countries such as Britain, domestic prices more or less matched international ones, but in other nations, most notably Germany, they were substantially higher.

Still, partisans of cartels usually held up the steel organization as a paragon. Certainly it brought a measure of stability to the market for steel without exploiting consumers in too crass a fashion, and by 1939 it dominated most aspects of the international steel trade, effectively replacing the free market with a system of agreements. Only the outbreak of war disrupted its operations. In one area, however, the cartel fell short of the hopes of its more optimistic partisans—it failed to execute a concerted program of modernization. Some firms took advantage of the stability offered by the cartel to update their facilities and streamline their organizations, but others apparently considered the security it guaranteed an excuse for inertia. Efficiency (or the lack thereof) continued to reflect the efforts of management.

Many other industries that like steel used capital-intensive technology to turn out undifferentiated commodities organized cartels. The producers of copper, lead, aluminum, petroleum, and "heavy" chemicals such as synthetic alkali and nitrates faced chronic overcapacity that threatened ruinous competition.[47] To avoid this danger, they formed organizations that set prices and allocated markets among members, cartels that held together largely because the companies involved firmly believed that unrestrained competition would be a disaster for all.

The electric lamp cartel stood in sharp contrast to the steel organization. It regulated competition in part by restricting access to proprietary technology. One company, the American giant General Electric (GE), dominated it, bending the organization to its own purposes. The cartel was also able to coordinate policies on production and design among its members.[48]

From its formation in the 1890s, General Electric had controlled the production and sale of electric lamps in the United States. Patents provided the foundation of its authority. The antitrust laws had never applied to the technological monopolies granted by patents. In 1926, the Supreme Court had decided in a case involving GE's lightbulb cartel: "A patentee, in licensing another person to make, use, and vend [the patented article], may lawfully impose the condition that sales by the licensee shall be at prices fixed by the licensor and subject to change at his discretion."[49] At first General Electric held Thomas Edison's basic patent on the lightbulb, and although this expired in the 1890s, by 1909, the firm had acquired the rights to the tungsten filament bulb, which represented a revolutionary improvement over earlier lamps.[50]

Though it allowed other producers to make lightbulbs, General Electric put strict limits on their operations. In a 1927 agreement with its most formidable competitor, Westinghouse, General Electric imposed a system of discriminatory royalties, charging only 1 to 2 percent on sales up to 25.4421 percent of the combined sales of the two companies, but 30 percent on sales above that level,[51] making such sales unprofitable to Westinghouse. The agreement also required Westinghouse to license back to GE, free of charge or condition, any improvements it developed in electric lamps—a provision that effectively eliminated Westinghouse's incentive for research, as it could not profit from innovations.

To maintain its position, General Electric invested heavily in research, hoping to expand its technological lead. It failed to develop any great breakthroughs but did obtain patents on useful improvements like tipless bulbs, nosag filaments, and frosted bulbs, as well as on various automated machines for making lamps. General Electric hoped that these rights would allow it to maintain control of the American market even after its patent on the tungsten filament expired in the early 1930s. To further discourage potential challengers GE passed much of the savings from improved productivity on to consumers, reducing prices for bulbs about 70 percent between 1922 and 1942.[52]

World War I turned General Electric's attention abroad. Before 1914, German firms had dominated the market for lamps in Europe, and GE and Westinghouse each had broad-ranging patent agreements with the largest of these, Algemeine Elektrizitäts Gesellschaft (AEG) and Siemens, which had kept trans-Atlantic competition to a minimum. The war cut the Germans off from foreign markets and led to the rise of new competitors, strong British and French companies and, most important, the Dutch firm Philips. With the return of peace in 1918, Siemens and AEG merged their electric lamp operations into an independent company called Osram, absorbed several small German producers, and launched an export drive to recapture lost markets. This program sparked a series of fierce price wars punctuated by unsuccessful attempts to organize a cartel.

The situation alarmed General Electric. The United States absorbed about half the lightbulbs produced in the world, and GE feared that as competition on the European continent became more savage, firms there (which had their own patents) would be tempted to invade the rich American market or to license their technology to GE's competitors. At the same time, confusion in Europe offered General Electric the opportunity to reshape the industry to its own liking. The company resorted to industrial diplomacy. As a first step it set up under the leadership of Gerard Swope a subsidiary, International General Electric (IGE), which took responsibility for all the company's foreign dealings and assumed all its holdings abroad. This put GE's foreign affairs in the hands of a group of executives assigned solely to the subject.

In 1924, IGE negotiated what became known as the Phoebus cartel for electric lamps. The agreement, which counted IGE but not its parent company as a party, reserved for each producer its home market and set quotas for exports enforced by a system of fines levied on those who exceeded the limits. It set up an independent Swiss company, Phoebus, to oversee operations, keeping track of sales and levying fines on those who oversold their quota. Financial arrangements cemented the organization. At this time GE was immensely profitable, so much so that it was able to dispense completely with bank loans.[53] In contrast, the war and subsequent inflation had deranged the finances of most of the European firms. GE already had stakes in several foreign companies; in the 1920s, it expanded the size and number of these investments. By 1930, it owned 20 percent of Osram, 10 percent of Tungsram of Hungary, 46 percent of Associated Electrical Industries of Britain, 44 percent of Compagnie des Lampes of France, 40 percent of Tokyo Electric, 17 percent of Philips, and 25 percent of AEG. It also purchased $11 million in debentures from Siemens, which after GE was probably the world's most formidable producer of electrical machinery.[54] The management of these firms welcomed General Electric's investment, and the companies retained their legal and practical independence. Yet in most cases IGE was the largest stockholder and as such enjoyed a very strong voice in the formation of overall policy.

The Phoebus cartel had an ambitious agenda. First, it stabilized prices at a fairly high level. The demand for lightbulbs was inelastic—that is, it changed little with the price of the object. Because as a rule consumers spent far more on electricity to power bulbs than on bulbs themselves, the price of electricity was the chief factor determining the demand for lamps. European producers reasoned that higher prices on bulbs would not depress sales while boosting profit margins per unit sold. General Electric particularly liked this policy, which allowed it to keep prices in the United States lower than European ones and so discourage challengers from the continent. In addition, the cartel provided for licensing technology among members, a system that earned GE substantial royalties. Finally, Phoebus pursued a far-reaching program of technical standardization. European firms had been producing electric lamps with a dizzying variety of voltage, longevity, brightness, and socket size. The cartel sought to regularize bulbs, setting up a central laboratory in Switzerland to which all members had to submit their goods. Few objected to the policy, as standardization lowered production costs as well as confusion among consumers. Another initiative, however, did not earn such universal praise. Phoebus (and in the United States, GE) systematically changed bulbs to allow them to produce more light per unit of electricity. This also cut the average life span of bulbs by about 20 percent, forcing consumers to purchase more of them. The cartel did not advertise the change, but when called to account, managers pointed out that the new bulbs provided more light per unit of power and so benefited customers. It was not clear, however, why consumers could not have chosen for themselves between the new, brighter bulbs and the old, longer-lasting ones.

In the early 1930s, competitors challenged the Phoebus cartel. The basic patent governing tungsten filaments expired, robbing GE of its most powerful weapon against rivals. The American firm still had rights to high-quality bulbs and filaments as well as automated machines for producing lamps, but new competitors circumvented these advantages. Small Japanese companies using labor-intensive methods and low-wage workers began to export bulbs throughout the world at prices well below those of the cartel. As a rule, the Japanese products were inferior, but many consumers were willing to take the chance to save money. Negotiation was not an option. The Japanese firms, which were generally quite small, numbered in the dozens—far too many to bring into the cartel. Nor was there any organization in Japan capable of speaking for lamp producers as a whole. In the United States, GE responded aggressively. It enjoyed a stronger position than Phoebus because its prices were lower, a difference that reflected in part the relative cheapness of electricity in the United States, which made electric lamps more of a mass market item than in Europe, and in part GE's desire to discourage potential challengers. As the Japanese began to make inroads, GE introduced a new, cheaper bulb in direct competition with their products that, coupled with a moderate tariff (20 percent), confined Japanese imports to less than 10 percent of the American market. The cartel did less well. Perhaps because it lacked GE's central management, Phoebus never developed a coordinated response to the Japanese challenge, and by 1939, the cartel's share of the market outside the United States had declined from almost 90 percent to 60 percent. Japan had become the world's second largest producer of lightbulbs, behind only the United States.

On the surface, the Phoebus cartel seemed a mixed success. Producers commanded high prices for well over a decade, and the cartel also imposed a measure of standardization, reducing the costs of production. Yet it attracted competition from Japanese firms that it failed to neutralize. On a deeper level, however, the cartel achieved the objectives of its organizer, General Electric, which looked to the Phoebus cartel to protect its immense American market. Throughout the interwar years, GE and its licensees produced approximately 90 percent of electric lamps sold in the United States. During this period, General Electric never made less than 20 percent on its capital invested in electric lamps, even during the worst years of the Great Depression. Viewed in this light, Phoebus was quite a success.

The Phoebus cartel provides an example of how and why firms in "high-tech" fields—electrical machinery, "fine" chemicals like dyes and drugs,[55] and optical instruments—organized cartels. Technology drove these industries, and each company wanted access to the discoveries of its competitors. The cost of inventing and bringing to market a new product could be huge.

For instance, DuPont spent $27 million to develop nylon before selling so much as a pound of it.[56] Firms sought to spread the cost of such ventures. Finally, the disruption of World War I had left some of these industries, such as dyestuffs and lightbulbs, with considerable excess capacity. Companies in these fields responded by devising complex webs of agreements that exchanged patent rights and other technical know-how and limited competition. Though rarely as lopsided as Phoebus, these accords did not treat all signatories equally. Firms with choice patents and superior research establishments usually imposed their wills on their weaker brethren. A company might force a better deal. In 1932, the German chemical giant IG Farben accorded Imperial Chemical a more prominent place in the dyestuffs cartel largely because ICI had demonstrated its ability to make important innovations in the field.[57] Such promotion did not come easily, however.

The production of raw rubber differed immensely from that of high-tech goods such as lightbulbs.[58] In the 1920s and 1930s, the makers of tires and other rubber goods used natural latex tapped from rubber trees grown largely on hundreds of plantations scattered throughout Southeast Asia. Though the automobile boom provided an expanding market for tires and, therefore, rubber, planters suffered from severe cycles of boom and bust. Rubber trees only begin to produce latex about six years after first planted, which prevented producers from rapidly adjusting supply to demand. A sudden surge in purchases always fell on a fixed number of trees, and when new output finally did become available, there was no guarantee of buyers. As a result, prices gyrated wildly.

Falling prices after World War I inspired the first rubber cartel. The maturation of trees planted during the initial advance in wartime demand combined with the postwar recession to drive rubber prices down from $.487 a pound in 1919 to $.163 in 1921.[59] This situation alarmed not only planters but also the British government, whose colonies produced about 72 percent of the world's rubber, whose subjects (250,000 of them) had investments in rubber plantations, and whose empire depended on the sale of rubber abroad to pay for imports. A cartel seemed the obvious solution, but there were far too many planters for them to negotiate an accord among themselves. In 1922, London imposed a cartel on producers in Malaya, who grew most of the Empire's rubber. Whitehall had tried to secure the acquiescence of producers in the Dutch East Indies, who accounted for 25 percent of world rubber output, but the Dutch government refused. It feared antagonizing the United States, the chief consumer. Nevertheless, London believed that unilateral action could retrieve the situation. The British program assigned each of its producers a quota based on 1920 output, allowing planters to export a certain percentage of that quota based on a formula tied to the price of raw rubber in London commodities markets. If the price fell short of a certain target, authorities would reduce production, but if the price surpassed this benchmark they would allow more exports.

This scheme exacerbated rather than mitigated the bust–boom cycle of the rubber industry. The restrictions on output coincided with a surge of growth in the automobile industry in the United States and an accompanying increase in the demand for tires. The cartel's mechanism for expanding output proved clumsy, and its chief response to higher demand was not to increase production but to raise the target price. By 1925, rubber was fetching $.730 a pound. Soon, however, prices began to fall as the growth of demand slowed and the Dutch East Indies began to exploit the reduction in British output by exporting more rubber. By 1927, the Dutch colony was producing 37 percent of the world's rubber, whereas the British Empire's share had slipped to 54 percent. Meanwhile, prices had fallen to $.223 a pound. Realizing as one English analyst put it, that "the British restriction scheme was benefiting Malay not at all, but her chief competitor [the Dutch East Indies] very much," London abandoned the program in 1928.[60]

The Depression led rubber producers to organize a new cartel. The downturn drove the price of natural latex to $.034 a pound in 1932, the lowest ever, creating desperation among producers. Governments led the way to restructuring. In 1934, after almost a year of negotiation, all the major producers—the British Empire, the Dutch East Indies, Siam (Thailand), and French Indochina—announced an agreement to stabilize the market. The accord apportioned market share among participants, strictly limited the planting of new rubber trees, and established the International Rubber Regulation Committee (IRRC) to determine total production and otherwise run the cartel. Member governments promised to enforce the IRRC's decisions in their territories. The agreement also contained an unusual feature designed to reconcile consumers, who had not fared well under the first cartel, to the new arrangement. It created an advisory committee of firms making tires and other rubber goods from Britain, the United States, and Germany. Though this body had no formal authority over policy, the IRRC regularly consulted with it.

The IRRC avoided the worst mistakes of its predecessor. It included all major producers, reducing the risk that outsiders would undermine its program, and it pursued a moderate pricing policy that eschewed any specific target but instead sought to keep demand and output in balance. When the cartel began operation in 1934, prices had already rebounded from their Depression low to $.12 a pound. Initially the cartel labored to reinforce the trend by restricting production, but as rubber demand increased during 1936, it allowed output to expand. Prices peaked at $.25 a pound in 1936, retreating during the subsequent recession, during which the IRRC reversed course and limited production. Prices bottomed out at $.146 in 1937 and rebounded to $.20 in 1940, which found the cartel again expanding output to meet wartime demand. Although the rubber market was still volatile, the IRRC had provided a measure of stability.

Perhaps nothing better demonstrates the vogue for cartels than the willingness of governments to create bodies like the IRRC to regulate trade in businesses too fragmented to organize themselves. Authorities usually acted for industries on which their national economies were particularly dependent or whose producers enjoyed special political influence. Cuba, whose sugar crop provided most of its exports, led in organizing the international sugar cartel, to which it required native producers adhere. The United States participated in the sugar cartel, in large part to help Cuba, which was in some ways an American protectorate and in whose sugar plantations U.S. citizens had heavy investments. Washington was also a party to an international agreement covering the sale of wheat, of which it was a leading exporter. Chile, whose export earnings came largely from the sale of natural nitrates, conducted talks on behalf of its many producers with the large foreign firms selling synthetic nitrates, and it made sure that producers within its borders kept these agreements. Like the IRRC, some of these cartels gave consumers a voice in operations. The sugar and wheat accords included the governments of consumer countries, limiting any tendency by the cartels to abuse their power by setting exorbitant prices.

By 1939, international cartels dominated large parts of the world economy. They governed some of the world's most dynamic and technically sophisticated industries like chemicals and electrical machinery as well as ancient businesses such as wheat and copper. The National Association of Manufacturers (NAM) estimated that before 1939, cartels were active in industries that accounted for 42 percent of world trade.[61] This figure ignores the widely varying strength of different organizations, some of which were little more than wishful thinking on the part of their organizers, and so exaggerates cartels' power. Nevertheless, effective cartels did exist in the chemical, electrical machinery, steel, nonferrous metal, petroleum, sugar, rubber, and wheat trades, which together accounted for about a quarter of international exchange during the 1930s.[62] In the late 1920s, perhaps the foremost German expert on the subject noted, "For several decades everyone has been affected by them [cartels] in a greater or lesser degree, not merely in Germany but—we may safely say—in every corner of the globe."[63]

Strong cartels, such as those for steel, electric lamps, and rubber, changed the nature of business. Instead of struggling for a better position vis-à-vis their competitors, firms cooperated to improve overall conditions in their industry. The most efficient companies still enjoyed larger sales and profits, but they obtained these through negotiation rather than competition. The possibility remained that companies might take aggressive steps against rivals, cutting prices or suing to invalidate key patents, but the role of such tactics was analogous to that of war in eighteenth-century European diplomacy—kept discreetly in the background and, when invoked, managed with restraint. Even when a firm did break with a cartel, its object was usually a better agreement, not the end of cooperation. Industrial diplomats came to hold important, sometimes dominant, positions in companies. One study of the heavily cartelized chemical industry noted, "Each of the major integrated chemical enterprises—I.G. Farben, I.C.I., Du Pont—developed a 'foreign policy' that encompassed a range of mutual problems, including not only market restraints but also technological exchanges, joint ventures, intercompany investments, and related matters. Each of these companies also established administrative departments to monitor negotiations and implementation of agreements."[64] Executives like Harry McGowan of Imperial Chemical and Gerard Swope of GE rose to leadership in their firms on their skills as industrial diplomats.

Of course, cartels did not abolish markets. An organization that pushed prices too high and took advantage of its customers, such as Phoebus in the 1930s or the rubber cartel in the 1920s, risked attracting outsiders that could wreck its schemes. Yet, managed conservatively, cartels could substantially reduce the risks of doing business, allowing firms to stabilize market share and command better prices.