To compete globally you have to be big. History explains why.

The Enduring Logic of Industrial Success

by Alfred D. Chandler

In 1881, John D. Rockefeller combined Standard Oil and 39 allied companies to form the Standard Oil Trust. His aim was not monopoly. Linked by financial ties, the companies in the Trust already controlled close to 90% of the kerosene produced in the United States. Rockefeller's goal was the cost advantages that could only be realized by placing the companies' refining facilities under a single management.

Quickly, the Trust's management concentrated close to one-quarter of the world's production into three 6,000 barrel-a-day refineries. Thanks to economies of scale, the unit cost per gallon dropped from 2.5 cents in 1879 to 0.5 cents in 1884 and to 0.4 cents in 1885. With this fivefold reduction in costs, Standard Oil could undersell kerosene made from Russian oil in Europe and kerosene made from Southeast Asian oil in China and still generate profits that created at least three of the world's largest industrial fortunes. Its successor, Exxon, remains the nation's biggest oil company.

At the same time in Germany, Bayer, BASF, and Hoechst—the world's oldest and still largest chemical companies—were driving down the price of dyes and pharmaceuticals by using economies of scope to reduce their production costs. Alizarin, a new, man-made red dye widely used in yarns, fabrics, and leather products, is representative. When the German companies began producing the dye, its price
was close to 200 marks per kilo. By 1878, the price per kilo had dropped to 23 marks, and by 1886, it had fallen even further, to 9 marks. By the end of the 1880s, the large German plants were producing more than 500 different dyes and pharmaceuticals at unit costs far below those of smaller competitors.

Over the next century, these stories were repeated in the other industries that have been most critical to the growth of modern economies. Whether we look at chemicals and electrical equipment in the 1880s and 1890s, motor vehicles in the 1920s, or computers today, the same pattern recurs. The dominant companies are those whose founders and senior executives understood what I call the logic of managerial enterprise, that is, the dynamic logic of growth and competition that drives modern industrial capitalism.

By conforming to this logic, entrepreneurs and managers helped to make Germany the most power-


Siemensstadt circa 1930
ful industrial nation in Europe before World War I, the United States the most productive country in the world from the 1920s to the 1960s, and Japan their most successful competitor since that time. Conversely, ignoring the logic—departing from its basic principles—in large part explains why the United States lost its competitive capabilities in such vital industries as semiconductors, machine tools, and consumer electronics.

The term managerial enterprise refers to large industrial concerns in which operating and investment decisions are made by a hierarchy of salaried managers governed by a board of directors. Recently, such organizations have been roundly attacked for dissipating wealth and stifling innovation. In fact, they have been the engines of economic growth and social transformation in industrial nations for the past 100 years. This lesson emerges clearly from my 10-year study of the 200 largest manufacturing companies in the United States, Britain, and Germany from the 1880s, when the modern industrial corporation first appeared, until World War II. [The insert “The Making of Scale and Scope” contains a brief overview of this research.] But we also see it reflected in the pages of the current business press. The logic that drives the creation and growth of large managerial enterprises is as relevant now as it was when John D. Rockefeller put together Standard Oil.

The Logic of Managerial Enterprise

The logic of managerial enterprise begins with economics—and the cost advantages that scale and scope provide in technologically advanced, capital-intensive industries. In these industries, large plants can produce products at a much lower cost than small ones because the cost per unit drops as the volume of output rises. [This is what is meant by economies of scale.] In addition, large plants can use many of the same raw and semifinished materials and intermediate production processes to make a variety of different products. [This is what is meant by economies of scope.] But these potential cost advantages can be fully realized only if the flow of materials through the plant can be kept constant to assure capacity utilization. That is why entrepreneurs like Rockefeller did not build giant industrial works until the 1880s, when integration of the railroad, the telegraph, the steamship, and the cable made it possible to speed goods and messages through an entire economy for the first time. It is also why large plants quickly became so common in chemicals, branded packaged foods, steel, agricultural machinery, and all the other “high technology” industries of the late nineteenth century.

But size alone is not enough to fully exploit the cost advantages of scale and scope. To capitalize on their manufacturing investments, the entrepreneurs who built these large plants had to make two related sets of investments. They had to create national—and then international—marketing and distribution organizations. And they had to recruit teams of managers: lower and middle managers to coordinate the flow of products through production and distribution, and top managers to coordinate and monitor current operations and to plan and allocate resources for future activities. Those who first made these large investments—the companies I call first movers—quickly dominated their industries and continued to do so for decades. Those who failed to make these investments rarely became competitive at home or in international markets, nor did the industries in which they operated.

The advantages of being a first mover were immense. To benefit from comparable costs, challengers had to build plants of comparable size—even as the first movers were working out the bugs in the new production processes. Challengers had to create distribution and sales organizations to capture markets where first movers were already established. They also had to recruit management teams to compete with those already well down the learning curve in their specialized activities of production, distribution, and research and development. Challengers did appear. But they were few.

First movers’ investments also transformed the structure of the industries in which they competed. These soon came to be dominated by a small number of large companies that vied for market share and profit in new ways. In these competitive battles, innovation and strategy were more powerful weapons than price. As far back as the 1890s, companies like Singer Sewing Machine, Procter & Gamble, and National Cash Register were competing by improving quality and creating new markets as well as by lowering costs. They searched for ways to carry out production and distribution more capably. They engaged in systematic research and development to improve their products and processes. They located better sources of supply and provided more effective marketing services. They differentiated their products in branded packaged products, primarily through adver-

1. It is important to distinguish first movers from the inventors of a product or process and from the pioneers who first commercialize an innovation. In mainframe computers, for example, several pioneers invested in marketing the new machines on a national scale. But it was IBM’s massive investments in the production, distribution, and management of the System 360 that made it the industry’s first mover. Often there is more than one first mover in an industry: BASF, Hoechst, and Bayer were all first movers in chemicals.
The Making of Scale and Scope

The historical data in this essay are drawn from Scale and Scope: Dynamics of Industrial Capitalism (Harvard University Press, 1990), a comparative study of managerial enterprise in the United States, Great Britain, and Germany from the 1880s through the 1930s. For more than half a century, these three countries accounted for some two-thirds of the world’s industrial output. Thus their 200 largest manufacturing companies—the companies whose collective histories Scale and Scope reports—constitute a global sample from which the patterns of growth and competitiveness described in this essay clearly emerge.

For information on individual companies I consulted a wide variety of sources: company and industry histories, scholarly monographs, journal articles and other secondary sources; investment directories such as Moody’s Manual for the United States, The Stock Exchange Yearbook for Great Britain, and the Handbuch der deutschen Aktiengesellschaften for Germany; published company and governmental reports, and, for those whose histories were most revealing, archival records. These sources provide information on changing product lines, production processes, shifts in markets, and sources of supply. They also indicate how and when companies grew: by direct investment, by merger and acquisition, by expansion overseas, and by expansion into new product lines. Finally, in many cases, they identify the company’s senior decision makers as well as the nature of the critical decisions these managers had to face and the decision-making processes they used.

Geographic expansion was usually based on economies of scale, while moves into related product markets more often rested on economies of scope. In both cases, however, organizational capabilities honed by oligopolistic competition provided the dynamic for continuing growth—of the companies themselves, the industries they dominated, and the national economies in which they operated.

Competitive Dynamics: Where Britain Went Wrong

The dynamics of the new competitive battles—and the costs of disregarding the logic of managerial enterprise—are evident in the history of British industry in the years before the second world war. Chemicals is a case in point. Of all the industries developed in this period (which historians rightly call the Second Industrial Revolution), chemicals was the most technologically advanced and provided the widest range of new industrial and consumer products. Among those products were medicines, fertilizers, textiles, film, and the industry’s first major innovation—synthetic dyes.

An Englishman, William Perkin, invented the first man-made dyes in 1856, and in the 1860s and 1870s Britain had almost every comparative advantage in the new industry. Dyes are made from coal, and Britain had the largest supplies of high-quality coal in Europe. Its huge domestic textile industry constituted the world’s largest market for the new dyes. All it lacked was experienced chemists, and British entrepreneurs had little trouble hiring trained German chemists for their factories. By any economic criteria, British entrepreneurs should soon have dominated the world in this new industry. Instead, German companies—Bayer, BASF, Hoechst, and three smaller enterprises—took the lead. Why? Because they made the essential investments in production, distribution, and management that the British industrialists failed to make.

Bayer’s experience is representative. In the late 1870s, Friedrich Bayer & Co. was a relatively small pioneer. Under the guidance of Carl Duisberg, a chemist still in his twenties, the company began exploiting economies of scope—developing first new dyes and then pharmaceuticals. Then in 1891, it decided to expand by purchasing a dye maker on the Rhine at Leverkusen, near Cologne, a location that was better for receiving raw materials and shipping finished goods than Bayer’s original works at Elberfeld. At first, plans called for enlarging the Leverkusen plant. But then Duisberg convinced his
colleagues to scrap the existing facilities and build a giant new works that would meet the company's needs for the next half century. (Today, almost 100 years later, Leverkusen is still one of the most efficient chemical plants in the world.)

Duisberg designed the new works to assure a steady flow of material from arrival through production to storage and shipment of the final products. He also made sure that each of the five production departments had its own laboratories and engineering staff and that the offices of the production engineers were close to the chemical laboratories so that "works chemists can at any time get into direct communication with the works engineers." As a result, Leverkusen's laboratories became and remained among the most innovative in the world, producing a stream of new dyes, pharmaceuticals, films, pigments, resins, and other products.

At the same time, Bayer invested heavily in marketing, distribution, and management. By the time the Leverkusen works went into operation, Bayer's global sales force of experienced chemists was contacting and working with more than 20,000 customers, all of whom had to be taught how to apply the new synthetic dyes to their materials. And by the turn of the century, Bayer had created one of the largest and most carefully defined managerial hierarchies the world had yet seen.

The Germans' competitive advantages demolished Britain's economic comparative advantages. In 1913, 160,000 tons of dye were produced. German companies made 140,000 (with the big three accounting for 72% of that output); 10,000 more came from Swiss neighbors up the Rhine. Total British production—4,400 tons. Figures for pharmaceuticals, films, agricultural chemicals, and electrochemicals tell much the same story.

A similar scenario was played out in the electrical equipment industry after 1882, when the first central power station opened in New York City. The industry sparked by Thomas Edison's inventions transformed economic life in myriad ways: by providing sources of light and power that altered urban living and transportation; by changing the ways of the workplace; and by giving rise to new industrial methods such as electrolytic processes for producing copper and other materials. British pioneers were as active in this industry as any in Germany or the United States. Sir William Mather, the senior partner of Mather & Platt, one of the largest British textile machinery manufacturers, obtained the Edison patents at the same time that Emil Rathenau did at AEG. But in the 1880s and 1890s, it was AEG and Siemens—and General Electric and Westinghouse in the United States—that made the essential first-mover investments, not Mather & Platt.

Again, the German story is instructive. In 1903, after merging with a major competitor, Siemens embarked on a ten-year plan to assure its global position, systematizing and rationalizing production by concentrating its operations under a single management. The result was the world's largest industrial complex, a giant set of works covering several square miles that Siemens financed largely from retained earnings. (The municipality of Berlin that the complex dominated soon became officially known as Siemensstadt.) Where Bayer had built a single works, Siemens constructed several in which more than 20,000 workers made telecommunications equipment and instruments, large machinery, small motors, dynamos, electrochemicals, and cables. Its domestic rival AEG built a similar though somewhat less massive set of works only a few miles away during these same years.

By 1913, two-thirds of the electrical equipment machinery made in British factories by British labor came from subsidiaries of GE, Westinghouse, and Siemens. AEG sold more products in Britain than the largest British company. Mather & Platt had become a minor producer of electrical equipment for factories. From the 1890s on, research and development to improve existing products and develop new ones was carried out in Schenectady, Pittsburgh, and Berlin—but not in Britain.

What was true of chemicals and electrical equipment was also true in heavy and light machinery, steel, and copper and other metals. In metals the British pioneered, but Germans and Americans made the essential investments that drove the British out of international markets. In machinery the British did not even try. German companies quickly took the lead in producing heavy processing machines and equipment for the new industries of the second industrial revolution (as well as many of the old). Americans acquired a near-global monopoly in sewing, business, agricultural, and other light machinery produced by fabricating and assembling standardized parts. By the 1880s, this high-volume production process was already known as "the American system of manufacturing."

If Britain had almost every comparative advantage in the new dye-making industry, why did German companies take the lead?
Regaining Competitive Capabilities

By 1900, the German chemical companies had driven nearly all the pioneering companies in Britain out of business. Earlier, the dye makers had petitioned Parliament for tariff or other protective legislation. But the British textile manufacturers—the most powerful industrial group in England—were delighted with the low price and high quality of the German products, while British scholars and policymakers had come to accept free trade as both an economic theory and an article of faith. (The fact that in the 1890s Britain was still the world’s largest exporter of machine-made goods doubtless deepened their commitment.) So the dye makers had little hope of government protection, and their enterprises failed.

Then came World War I. To meet acute shortages, the British producer expanded its output. The government set up another enterprise, British Dyestuffs Corporation, and then, in 1918, acquired the private company. This expansion of capacity plus the greatly enlarged output of the Swiss producers (Ciba, Geigy, and Sandoz) permitted Britain to obtain essential dyes at high cost.

Once the war was over, however, the German companies came back quickly. By 1921, the newly appointed head of British Dyestuffs told the Board of Trade that he saw little hope of making the company competitive unless it acquired technical skills from the Germans. The latter were willing enough to strike a deal, but their proposal would give them de facto control. British Dyestuffs would become little more than their selling agents in Britain. Neither the Conservative nor the Labour party could accept such terms.

In 1925, the government pulled out, but British Dyestuffs did little better in private hands. As 1926 opened, Reginald McKenna, head of the Midland Bank, former Chancellor of the Exchequer, and former chairman of the Board of Trade’s committee to supervise British Dyestuffs, began to plead with one and then the other of the two largest British chemical companies, Nobel Industries and Brunner, Mond, to take British Dyestuffs under their wing. His pleas set off a series of complex negotiations that led to the formation of Imperial Chemical Industries (ICI) in the fall of 1926. (By then, both industry and government saw the merger as an essential response to the creation of I.G. Farben, which consolidated Bayer, BASF, Hoechst, and five smaller German chemical companies.)

Nobel Industries and Brunner, Mond were the only two chemical companies in Britain that had recruited a substantial set of top and middle managers. And both had strengthened their organizational capabilities after the war. Nobel Industries had acquired several small explosives producers and then become one of the first companies in Britain to do what had become standard practice in the United States—reorganize and rationalize the merged companies. Explicitly following the example of its American ally, E.I. du Pont de Nemours, Nobel Industries centralized its administrative structure, created functional departments, closed down 44 older factories, sold off obsolete plants and equipment, and invested in up-to-date machines.

Brunner, Mond, the other merger partner, had grown more by direct investment in plant and personnel than by acquisitions. Of these investments, by far the most costly and important was one to produce synthetic nitrates for fertilizers through a process acquired from the Germans as a spoil of war. By 1926, Brunner, Mond had invested £3 million in the project (undertaken at the urging of the British government) and had yet to show a profit. Once fully in operation, however, it assured Britain a strong position in international markets.

More reorganization and rationalization followed the formation of ICI. Eventually, management created a multidivisional structure with autonomous integrated divisions, or “groups,” for explosives, synthetic alkalins, dyestuffs, nitrates and fertilizers, and chemicals, among others. By the 1930s, ICI was becoming an effective global competitor in all these products. Agreements struck by international cartels during the depression years reflect its growing strength. In the nitrate agreement of 1932, for example, ICI received a quota of close to 20% and exclusive marketing rights in several large markets. That same year, it obtained close to 10% in comparable agreements on dyes—a far cry from the outcome of the British Dyestuffs negotiations in the early 1920s. As one ICI executive observed, “the only way BDG [ICI’s Dyestuff Group] could get into the dye business was to invent its way in. The I.G. [Farben] never took much notice of BDG until they found that BDG could invent.”

As this comment indicates, capabilities developed in exploiting economies of scale and scope encouraged process and product innovation. From 1933 through 1935, the dyestuffs laboratory came up with 87 new products including rubber goods, chemicals, synthetic resins and lacquers, detergents, pesticides, and pharmaceuticals.

The moral! Through management’s decisions and actions, ICI and its two predecessors were able to achieve what too few British industrial enterprises have ever done: develop the product-specific facilities and skills essential to obtain and maintain a competitive position in world markets.
As these examples suggest, the opportunity to make first-mover investments and create a managerial enterprise is short-lived. And once the opportunity is lost, it is hard for an enterprise and its national industry to regain competitive capabilities, even in its own domestic market. The British did succeed in chemicals through the creation of Imperial Chemical Industries [ICI], as the insert “Regaining Competitive Capabilities” relates. But that was the only major technologically advanced industry in which they ever regained a strong competitive edge.

Competitive Dynamics: What IBM Did Right

The passage of time has not made the logic of managerial enterprise obsolete. On the contrary, its principles were clearly at work in the development of the computer industry after World War II, and they drive competition in the industry today. But there is one striking historical difference: most of the computer industry’s pioneers were long-established managerial enterprises in closely related industries, not entrepreneurs.

U.S. business machine companies were the first to see the commercial possibilities of the costly giant computers initially developed for scientific and military purposes. In 1951, Remington Rand, the nation’s leading typewriter company, began to develop UNIVAC, the first computer designed for business uses. Other leading business machine companies—IBM, Burroughs Adding Machine, National Cash Register, and Honeywell [all players in their industry for decades]—quickly followed. Still other pioneers were large, established enterprises with electronic capabilities—Raytheon, General Electric, RCA, and Philco. The only new company to enter the competition was Control Data, founded by William Norris in 1957.

All these pioneering companies made substantial investments in producing and distributing the new machine. But IBM was the first to make the investments that transformed it into the industry’s first mover. The strategy of IBM’s top managers, particularly Thomas Watson, Jr., was to pursue as wide a commercial market as possible. Several years of intensive investment in research and production led, in 1964, to the introduction of the System 360, a broad line of compatible mainframe computers with peripherals for a wide range of uses. IBM’s massive investment in research and production, the swift expansion of its international marketing organization, and an impressive increase in its management ranks gave the company the dominant industry position it retains today.

With the single exception of Control Data, IBM’s successful mainframe competitors continued to be business machine companies, all of which acquired electronics companies to improve their production and research competences. In contrast, the electronics companies dropped out of the business. Raytheon and General Electric sold their operations to Honeywell. RCA’s computer activities were acquired by Sperry Rand. And Philco dropped its computer operations soon after it was taken over by the Ford Motor Company. These companies had as great a potential for success in computers as the business machine companies did. But by the 1960s, they had become widely diversified. Because computers were only one of many product lines, top management was unwilling to allocate the time and make the large investments necessary to build an effective competitive capability. (Much the same thing has happened more recently in consumer electronics.)

Entrepreneurial companies played a greater role in mini- and microcomputers where opportunities existed to design machines using different technologies for different markets. Nevertheless, the logic holds: the successful companies followed a first-mover strategy. At Digital Equipment, for example, heavy investments in manufacturing for the PDP-8 line of minicomputers were accompanied by the creation of a worldwide marketing network and a sharp rise in the number of managers. Edson de Castro, the engineer who headed the design team for the PDP-8, made a comparable set of investments when he left DEC in 1968 to form Data General. However, the third pioneer, Scientific Data Systems, failed to scale up and quickly disappeared from the scene after it was acquired by Xerox in 1969.

The most successful challengers to DEC and Data General were not entrepreneurial enterprises but managerial companies. By 1980, DEC ranked second and Data General fourth in revenues generated. IBM was first, Burroughs third, and Hewlett-Packard, an established producer of electronic measuring and testing instruments, fifth. The sixth was Wang Laboratories, a first mover with a new product for a different market—word processing and office systems. Together these six accounted for 75% of the revenues generated in the minicomputer branch of the industry.

Much the same pattern appears in personal [micro] computers. By 1980, the first entrepreneurial companies to make extensive three-pronged investments—Apple Computer, Tandy, and Commodore—accounted for 72% of U.S. dollar sales. The three pioneers that accounted for 50% of sales in 1976 had already
dropped by the wayside. Two years later, however, three established companies—IBM, NEC, and Hewlett-Packard—moved in and captured 35% of the market, driving the entrepreneurial first movers' share down to 48%.

Like American machinery manufacturers in earlier years, these computer companies quickly moved abroad. IBM almost immediately became the leading producer of mainframe computers in Europe. DEC led in microcomputers. By the mid-1980s, Apple and IBM were already world leaders in personal computers. Long-established enterprises created all but one of the successful European or Japanese competitors. True to form, British pioneers failed to make the necessary investments in production, distribution, and management. By 1974, only a little over a quarter of all computer installations in Britain came from British producers.

Major players in the industry have changed little in the past decade. Of the 20 largest hardware producers in 1987, only two were founded in the 1980s. The single successful challenger in existing sectors was Compaq (ranked fourteenth in total revenues), whose management announced in its very first annual report that it thought of itself “as a major company in its formative stage rather than as a small company with big plans” and invested accordingly. The other new company, Sun Microsystems (ranked twentieth), followed the path entrepreneurial companies had traditionally taken and developed a new architecture for a new market, workstations.

Conforming to the logic of industrial growth kept U.S. computer companies competitive—even as they encountered hurdles like the rising cost of capital, the fluctuating dollar, and antitrust and other regulatory legislation that are often cited to explain the decline of other industries. In 1987, U.S. companies still enjoyed just under 60% of the European market in mainframe and minicomputers and just over 20% of the Japanese market. In Europe, IBM's market share was 35%, DEC's 7%, Unisys's (formed by the merger of Burroughs and Sperry Rand in 1986) 5%, and Hewlett-Packard's 3%. In Japan, IBM has 15%, Unisys 3%, and NCR 2%. In microcomputers, Apple and IBM (with Japan's NEC) accounted for 50% of the world market. Foreign competition in the United States remains limited except in some peripherals.

In semiconductors, the story has been very different. This industry, which supplies critical components for computers, telecommunications, factory automation, robotics, aerospace, and production controls, was created in the United States. In the mid-1970s, the pioneering American companies held 60% of the world market, 95% of the domestic market, half the European market, and a quarter of the Japanese market. By 1987, their world market share had fallen to 40%, while the Japanese share had risen to 50%. The United States had become a net importer, with the Japanese supplying 25% of its market. Japanese enterprises controlled over 80% of the world's sales of DRAMs invented by the U.S. company, Intel. IBM, the only world-class producer of semiconductors in the United States, is working with the Defense Department through Sematech to try to save the industry.

What happened? Again, the diversified electronics companies with the greatest capabilities for production and continuing research in semiconductors—RCA and GE—pulled out, while Ford's takeover of Philco destroyed the potential there. More serious, though, was the pioneering companies' failure to invest and grow. If IBM is the prototype of the giant managerial enterprise as first mover, surely the semiconductor companies in Silicon Valley epitomize entrepreneurial enterprise. Instead of making the long-term investments to create organizational capabilities and then continuing to reinvest, they remained small or sold out, often to the Japanese. Repeatedly, groups of engineers left their companies to start new ones. Too many companies—both old and new—ignored the logic of industrial growth. Those few that did not—Texas Instruments, Motorola (both established well before World War II), and
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Intel—remain significant players, America's major hope (with IBM) of staving off the Japanese challenge. In Japan, on the other hand, makers of semiconductors followed the logic to its profitable conclusion. Like IBM, all made computers; unlike IBM, they produced semiconductors not only for themselves but also for the larger domestic and international markets. These companies—NEC, Hitachi, Toshiba, Mitsubishi Electric, Oki Electric, Fujitsu, and Matsushita—were long-established producers of electrical and telecommunications equipment. They had diversified but only into closely related product lines. Moreover, all belonged to keiretsu—groups of allied, independent enterprises with their own bank and trading companies—and these allies provided further financial, marketing, and research benefits.

By aggressively exploiting the cost advantages of scale and scope, these Japanese companies easily drove entrepreneurial American competitors and the large, more widely diversified electronics companies out of the business or into specialized niches. Efforts by the very few remaining U.S. semiconductor companies may permit them to win back market share. But if the experience of British entrepreneurs in the chemical, electrical, and machinery industries is any indication, such restructuring is difficult and the opportunity to regain competitiveness, fleeting.

When Large Is Not Logical

If size makes sense, as I have been arguing, why have so many large U.S. companies done so poorly in the last few decades? Why is size so often a disadvantage rather than an asset? One answer is that like any human institution, managerial enterprises can stagnate. In the 1920s, Henry Ford destroyed his company's first-mover advantages with a series of wrongheaded decisions, including the firing of his most effective executives. Both GM and Chrysler seized the opportunity to challenge Ford's dominance, first by investing in mid- and high-priced cars and then by moving into the low-price range where Ford had held a worldwide monopoly. Only after Henry Ford died—and his son had hired a group of GM managers to restructure the company—did the automaker begin to regain competitive strength and profits. A similar tale is unfolding today, of course, as the Big Three struggle to regain market share and profitability lost to foreign competitors in the 1970s.

More serious to the long-term health of American companies and industries was the diversification movement of the 1960s—and the chain of events it helped to set off. When senior managers chose to grow through diversification—to acquire businesses in which they had few if any organizational capabilities to give them a competitive edge—they ignored the logic of managerial enterprise. Under these circumstances, bigger was worse, not better.

The catalyst for this diversification was unprecedented competitive pressure. Growth has always been a basic goal of managerial enterprises. And as I have already pointed out, growth came primarily by moving abroad or into new markets in related industries. But until the 1960s, the full impact of this international and interindustry competition was held back by world events.

World War I and the massive inflation and military occupation of the Ruhr and the Rhineland that followed kept German companies out of international markets for almost a decade. They returned with impressive strength between 1925 and 1929, only to be reined in again by the coming of the Great Depression, Hitler's command economy, and the disastrous second world war. Depression, global war, and post-war recovery also dampened or redirected the growth of U.S. enterprises and those in other European nations. As a result, the international competition that had been developing before 1914 only became a full-fledged reality in the 1960s, once the economic health of the European nations was fully restored and Japan (following a massive technology transfer) was rapidly industrializing. At the same time, unprecedented investments in research and development were intensifying interindustry competition in the United States and Europe.

This new competition challenged many American companies as they had not been challenged since their founding decades earlier. The challenge was particularly unexpected because the American economy was so prosperous. Even so, markets became saturated. And with capacity underutilized, costs rose.

Many U.S. managers responded as the business machinery executives did, by reinvesting to improve their capabilities in their own and closely related industries. But others began to grow by moving into industries in which their enterprises had no particular competitive advantage. Because they had had little competition abroad since well before World War II—

Too many managers made the mistake of listening to academics who told them management was a general skill.
and because they were being told by academics that management was a general skill—many of these executives had come to believe that if they were successful in their own industries they could be just as successful in others. Moreover, their companies were cash-laden precisely because the postwar years of American hegemony had been so prosperous. So they sought to invest retained earnings in industries that appeared to show a greater profit potential than their own, even though those industries were only distantly related or even unrelated to their companies’ core capabilities. And because they lacked knowledge of their targets’ operations, they obtained these plants and personnel not through direct investment as in the past but through acquisitions or, occasionally, mergers.

The Tangled Logic of Diversification

By the late 1960s, acquisitions and mergers had become almost a mania. The number rose from just over 2,000 in 1965 to over 6,000 in 1969. From 1963 to 1972, close to three-fourths of the assets acquired were for product diversification, and one-half of these were in unrelated product lines. From 1973 to 1977, one-half of all assets acquired through merger and acquisition came from unrelated industries.

Such unprecedented diversification led to another new phenomenon: the separation of top management at the corporate office from the middle managers who were responsible for running the operating divisions and battling for profits and market share. This separation occurred for two reasons. First, top managers often had little specific knowledge of or experience with the technological processes and markets of the divisions or subsidiaries they had acquired. The second was simply that the large number of acquired businesses created an extraordinary overload in decision making at the corporate office. Before World War II, the corporate executives of large, diversified international enterprises rarely managed more than 10 divisions, and only the largest companies had as many as 25. By 1969, many companies were operating with 40 to 70 divisions, and a few had even more.

Because few senior executives had either the training or the experience to evaluate the proposals and monitor the performance of so many different divisions, they had to rely more and more heavily on financial data. But as H. Thomas Johnson and Robert S. Kaplan point out in Relevance Lost: The Rise and Fall of Management Accounting, such data were no longer very helpful for understanding the complexities of competitive battles. The reason was simple: accounting methods developed by Carnegie, Brown of Du Pont and General Motors, and other industrialists to manage costs had been replaced by financial reporting techniques devised by professional independent public accountants (imported from Britain) that focused on defining profits.

Managerial weaknesses arising from the separation of top and operating management quickly led to another new phenomenon—the sale of operating units in unheard-of numbers. Before the mid-1960s, divestitures were rare. By the early 1970s, they had become commonplace. In 1965, there was only one divestiture for every 11 mergers; by 1970, it was 1 to 2.4; and from 1974 to 1977, the ratio was close to or even under 1 to 2.

All these mergers, acquisitions, and divestitures established the buying and selling of corporations as a business—and a lucrative one at that. While the industrialists pioneered in this business, the financial community prospered most from it. Many financial institutions (particularly investment banks) turned away from what had been their basic function for almost a century: providing funds to supplement retained earnings to keep people and plants competitive. (Financial institutions in Japan and continental Europe still perform this function effectively.)

The new business was further encouraged by another unprecedented change—this one in the ownership of U.S. industrial companies. Before World War II, most securities were held by relatively wealthy individuals and families. Even as late as 1952, only 4.2% of the American population held corporate securities (and this includes owners of mutual funds). The major institutional investors were insurance companies and the trust departments of commercial banks, which normally invested for growth and assets rather than for short-term gains in share prices and dividends.

After World War II, however, growing numbers of shares were held by pension and mutual funds. Begun in the 1920s, these funds grew little during the depressed years of the 1930s. But by the 1960s, they had come into their own, and their managers were being measured by how well their portfolios performed against the Standard & Poor’s indexes. To succeed they had constantly to buy and sell securities. As time passed, they increasingly traded securities in large blocks of 10,000 shares or more.

As the number of such funds and the volume of the securities traded increased, both block sales and turnover rose rapidly. And this made possible still another new phenomenon—the coming of an institutionalized market for corporate control. For the first

time, individuals, groups, and companies could obtain control of well-established companies in industries in which the buyers had no previous connections simply by purchasing their shares on the stock exchange. Large blocks of stock were being traded regularly and such buyers had little trouble raising funds for their purchases from financial institutions and financiers.

By the mid-1970s, widespread restructuring was clearly required. Continuing intense competition made it imperative that senior managers reinvest in reshaping and rationalizing operations to maintain—or regain—competitiveness. The same was true for enterprises that had grown huge and unwieldy through unbridled diversification. But the desire of investment banks and other financial institutions to maintain their new and profitable business and the need of pension and mutual fund managers to maintain the current value of their portfolios clearly affected how managers could proceed.

Restructuring for Competitiveness

Taken together, these phenomena have greatly facilitated corporate restructuring. Large companies can be bought, sold, split up, and recombined in ways that would have been impossible before the acquisition wave of the 1960s. Such restructuring can be destructive. It contributed greatly to the dissolution of powerful U.S. companies such as International Harvester and Singer Sewing Machine, to the loss of others like B.F. Goodrich and Uniroyal to foreign control, and to the destruction of the U.S. machine tool industry. Nevertheless, this flexibility has not been all bad. On the contrary, it can help enhance competitive capabilities if it is used in the service of a carefully considered long-term strategy. Again, the chemicals industry provides a case in point.

The intensified interindustry and international competition of the 1960s hit chemical companies especially hard. Forced to restructure, the managerial enterprises that had long dominated their national industries—Du Pont, Union Carbide, Dow, and Monsanto in the United States—as well as BASF, Bayer, and Hoechst in Germany, Ciba-Geigy in Switzerland, and ICI in Britain—reshaped their product lines and organizational strategies. In the process, they also restructured the industry.

These companies narrowed their product lines, spinning off many of the commodity products, particularly petrochemicals. (At Dow, for example, commodities dropped from 63% of sales to 35% in five years.) They expanded output in existing higher value-added specialties. And they moved into new areas such as pharmaceuticals, biotechnology, and advanced materials, often through acquisitions of pioneering companies. In other words, they stuck to the same basic strategy they had followed for a century—pursuing growth through economies of scope and developing markets that best fit their distinctive core production and research technologies.

New entrepreneurial companies played almost no role in the restructured industry, although some smaller businesses did appear to operate and occasionally consolidate the petrochemical activities the giants had spun off. Today the United States remains an exporter of chemicals. Japanese companies have yet to become serious competitors in U.S. or international markets.

Other manifestations of the market for corporate control can also build competitiveness. Take conglomerates. As long as their executives concentrate on a relatively small number of divisions (as, for example, those at Tenneco do), they can often provide a more effective and immediate discipline over managerial inertia than the product markets can. Similarly, outside directors representing financial institutions or large stockholders can play an important role in reviving stagnant companies by bringing in outsiders to turn the company around. But the basic task of conglomerate managers, outside directors, and new CEOs must be to recruit managers with the experience and skills to understand the enterprise's complex technological products and processes, the intricacies of its many markets, and the activities of its competitors.

Individual financiers, managers, and shareholders have often profited from ignoring the dynamics of managerial enterprise in capital-intensive industries. But the consequences of their actions have hurt the long-term health of the enterprises and industries involved. The development, production, and distribution of goods for national and global markets require a wide variety of activities calling for many different facilities and skills. Only when all these activities are carefully coordinated can they be integrated in ways that reduce price, assure quality, and provide essential services. Such cooperative efforts are so profitable that if entrepreneurial enterprises fail to become managerial and managerial enterprises fail to maintain and nourish their competitive capabilities, they will lose markets and profits to those in other nations and other industries that do. At least that has been the experience of the industries that have done most to transform the world since the coming of modern transportation and communication networks more than a century ago.

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