Richard N. Langlois

THE CAPABILITIES OF INDUSTRIAL CAPITALISM

Alfred D. Chandler, Jr. is a worthy successor to Joseph Schumpeter as analyst of the large corporation and its role in economic growth. His new book, Scale and Scope, a comparative history of corporate capitalism in the U. S., Britain, and Germany, is animated by a vision of the large corporation as the leading force in economic growth, outdistancing older owner-managed forms of organization with a superior ability to invest entrepreneurially in large-scale production, mass distribution, and professional management. Chandler's account implicitly relies on a dynamic "capabilities" theory of competition that reveals the fundamental irrelevance of neoclassical theory and policy, including antitrust policy. In some ways, however, Chandler's vision is too narrow, underplaying the role of markets in economic growth. One needs to know how economic systems build capabilities, not merely how the corporate institution does so. Moreover, there is reason to think that the last few decades have seen an organizational revolution with a dynamic rather different from the one that animates Chandler's account. As a result, Chandler's work is important for understanding the present-day issues of industrial competitiveness, but is only one piece of the puzzle.

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Richard N. Langlois, Professor of Economics, University of Connecticut, Storrs, CT 06269-1063, telefax (203) 486–4463, is editor of Economics as a Process: Essays in the *New* Institutional Economics (New York: Cambridge University Press, 1986) and lead author of Microelectronics: An Industry in Transition (London: Unwin Hyman, 1988). **He would like to thank Fred Carstensen, Alfred Chandler, Paul Robertson, and the editor for helpful comments and discussions.**

In 1932, Adolf Berle and Gardiner Means made an important discovery. The American economy was no longer driven by small, owner-operated businesses, but had come to be dominated by the large corporation.' More interestingly, they noticed, corporations were coming increasingly to be managed by salaried professionals rather than by their equity owners. From this the authors concluded that one could no longer count on markets to discipline corporations, and that one could expect managers to "plunder" stockholders for personal gain. Here at once were fanned the two great populist fears about the corporation: concentrated power and the separation of ownership from control.

Berle and Means were long on ominous statistics but short on analysis of the corporation as an institution. What was its rationale, its logic, its dynamic? What was its role in the economic process? Neoclassical economic doctrines were not much help. Like Berle and Means, they started from the assumption of small, owner-managed firms as a normative standard, and thus what light they could shed revealed the same dark possibilities of concentration and plunder. On the whole, indeed, the Depression decade of the **30s** was an ideological low-point for the large corporation, an institution never blessed in any era with favorable press.

But the corporation was not entirely without its defenders. Perhaps the most important was Joseph Schumpeter, Harvard economist by way of Vienna, whose ***Capitalism, Socialism, and Democracy*** appeared a decade after Berle and Means? If one takes the trouble to look at economic history, Schumpeter observed, one cannot conclude that the development of the large enterprise has brought monopolistic restriction of output or corporate plunder. Quite the reverse.

> As soon as we go into details and inquire into the individual items in which progress was most conspicuous, the trail leads not to the doors of those firms that work under conditions of comparatively free competition but precisely to the doors of the large concerns—which, as in the case of agricultural machinery, also account for much of the progress in the competitive sector—and a shocking suspicion dawns upon us that big business may have had more to do with creating [the modern] standard of life than with keeping it down.[4]

To Schumpeter, the power of the corporation, over which Berle and Means had fretted, was in fact what turned the engine of capitalist growth. The competition that drives the large enterprises is not—and ought not be—the polite competition of a large number of small powerless firms. "The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of pro-

duction or transportation, the new markets, the new forms of industrial enterprise that capitalist enterprise creates."[5]

Schumpeter provided a provocative vision of the large corporation and its role in history. But, despite his appeal to the past, he did not actually provide us with much history. The same cannot be said of Alfred D. Chandler, Jr., the dean of modern business historians,[6] who has indeed taken the trouble to look at economic history. And what he sees is Schumpeter's corporation, not that of Berle and Means or the neoclassical economists.

The Dynamics of Industrial Capitalism

In *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1990), Chandler offers a voluminous set of "collective histories" of corporate enterprise through World War 11. Despite the encyclopedic detail, however, his objective is persuasive, not antiquarian. As the subtitle suggests, Chandler is out to distill the essence of the modern corporate enterprise and demonstrate its role in economic growth. Those enterprises, he writes, "whose collective histories are presented in this study—those enterprises that were most responsible for the economic growth of the world's three largest industrial nations—have provided a fundamental dynamic or force for change in capitalist economies since the 1880s" (4).

The basic argument is not new to this volume. Chandler has been telling much the same story for some three decades.' But there are two things distinctive about the new book. First, it is a comparative exercise, looking at the development of the large corporation not only in the United States but also in Britain and Germany. Second, the vision of the corporation that emerges from *Scale and Scope* seems clearer and stronger—or at least narrower—than in the earlier books.

What is Chandler's thesis? It is, in a sense, an organizational variant on Adam Smith's famous observation that the division of labor grows with the extent of the market. As technological change—notably the railroads and the telegraph - lowered the costs of transportation and communication in the nineteenth century, the potential arose for high-volume production enjoying economies of scale. The large corporation sprang up as an organizational response to these emerging possibilities. The firms that were most successful, those that contributed the most to economic growth, were the ones that built and maintained the organizational capabilities necessary to exploit economies of scale (and later of scope). Building such organizational capabilities required an investment in the capital equipment necessary for high-volume production. It meant investing in a

regional, national, or international network of marketing and distribution. And it also meant turning over the reins of management to a hierarchy of salaried professionals. "It was this three-pronged investment in production, distribution, and management," Chandler writes, "that brought the modern industrial enterprise into being."

> The first entrepreneurs to create such enterprises acquired powerful competitive advantages. Their industries quickly became oligopolistic, that is, dominated by a small number of first movers. These firms, along with the few challengers that subsequently entered the industry, no longer competed primarily on the basis of price. Instead they competed for market share and profits through functional and strategic effectiveness. They did so ***functionally*** by improving their product, their processes of production, their marketing, their purchasing, and their labor relations, and ***strategically*** by moving into growing markets more rapidly, and out of declining ones more quickly and effectively, than did their competitors. (8, emph. original)

It would be hard to find a clearer statement anywhere of the notion of Schumpeterian dynamic competition.

Entrepreneurial Success, Entrepreneurial Failure

Chandler's story is not a deterministic one. Although it sometimes seems as if economic preconditions led naturally to the development of the large corporation, usually it is clear that human judgment and accidents of history mattered: there were roads not taken and out-and-out blunders.

As far as economic preconditions are concerned, Chandler agrees with a number of writers' that the large internal market within the United States led more naturally to the formation there of capabilities for large-scale production and distribution than did the more fragmented urban markets in Europe. Because of the highly rural character of the population, the railroad had a greater impact in America, and mass distribution—as practiced by Sears and Montgomery Ward, for example—mattered more. It is not surprising, then, that the U. **S.** led the way in the development of the large corporation. Yet success, at least at the level of the firm, was never inevitable. Henry Ford in automobiles and Judge Gary of U. **S.** Steel both dissipated their firms' capabilities and allowed others to approach or surpass them.

But the most interesting story of paths not taken is the failure of the British to develop the corporate institution and the competitive capabilities that go with it. Here Chandler enters the much-trod ground of the British entrepreneurial-failure debate." As the pioneer of the First Industrial Revolution, Britain was well out in front when the so-called Second

Industrial Revolution—driven by the innovations in transportation and communication mentioned earlier—rolled around. Many of the industries from the earlier period, notably textiles, offered scant potential for economies of scale. Britain had also invested heavily in earlier infrastructure, including an extensive canal system. The kingdom was also smaller and more urban than the U. S. All of this meant that the railroads and telegraph made less of an impact. Moreover, its relatively sophisticated, diverse, and close-at-hand urban consumers made mass marketing of mass-produced goods less attractive. Nonetheless, Chandler thinks, there were times and places in which British businesses had the potential to jump in front if they had only adopted the corporate form and built the necessary capabilities. For example, in light machinery, electrical equipment, chemicals, and metals, the British squandered a potential that was as large as any in the U. S. or Germany (275). They did so by failing to make the necessary entrepreneurial investments in production, distribution, and management.

Why? Chandler knows the proximate cause, but is fuzzy on the ultimate cause. The immediate problem was the British attachment to the family firm, a mode of organization Chandler calls personal capitalism. That is, Britain's legacy from its industrial lead was the kind of owner-managed firm idealized in neoclassical theory and mourned by populists. As markets—and with them firms—grew, British businessmen opposed consolidation and rationalization because they feared the loss of family control. Thus they tried to manage growing concerns from small central offices, and predictably failed to take the bold, entrepreneurial steps of their American and German rivals. But why? Chandler mentions the familiar cultural arguments, but in the end leaves the issue unresolved. The matter **is** particularly puzzling because, in all three countries, the development of the large corporation often came through stages of merger and consolidation. First came federations or trade groups of small firms (trying contractually to share markets and limit competition), followed by holding-company trusts, followed in turn, especially in the U. S. and Germany, by rationalized, competitive, professionally managed corporations employing the multidivisional organizational form. The British owners were especially recalcitrant in yielding control, often thereby preventing the move to the third stage. But why didn't vested interests in the U. S. and Germany oppose rationalization as strongly?

The Irrelevance of Antitrust

Germany affords an equally interesting comparative perspective, but one with quite different messages. In terms of economic preconditions, Ger-

many fell between the U. S. and Britain. It was not as large, new, or rural as the U. S., but it was bigger, industrially newer, and more rural than Britain. The railroads made more of an impact. But along another dimension, Germany was a lot less like the U. S. than was Britain. Chandler makes a point of describing Germans as practicing "cooperative" capitalism, in which inter-firm cooperation was the norm and cartels were welcomed openly. In both the U. S. and Britain, cartel agreements were unenforceable under common law, whereas German law allowed for enforceable price-fixing and market-sharing contracts. In America, this difference was sharpened by the Sherman antitrust act of 1890, which formally outlawed cartel agreements. Chandler asserts—or at least allows us to infer—that the Sherman Act was helpful in directing the competitive energies of American firms away from restraint of trade and toward the building of capabilities: because cartels were forbidden but mergers were not, American firms were more inclined to merge than to collude, which made rationalization easier. Yet Germany, the land of the cartel, was somehow able to rationalize and to create capabilities without antitrust laws of any kind. And Britain's common-law hostility to cartels was no spur to rationalization.

The German case suggests the relative unimportance of antitrust policy to the development of the large corporation—let alone to comparative economic success. Indeed, this is something of a theme in ***Scale and Scope,*** albeit one that emerges out of silence. Chandler is convincing that the hated trusts of the late nineteenth century were actually in the business of increasing output, lowering costs, and competing vigorously. It is true that these firms, like all organizations, would have preferred not to compete. And they certainly did try to limit competition, especially price competition, through various kinds of inter-firm arrangements. But cartels always proved fragile. They were especially poor at preventing non-price competition, the competition in functional and strategic effectiveness that is the strong suit of the modern corporation. Many firms recognized that competitive advantage through superior capabilities was in the end an alternative far superior to limiting competition. Chandler offers a telling quotation from a letter by one Albert Moxham to his boss Coleman du Pont, one of the trio of cousins who consolidated and rationalized the fragmented American explosives industry at the turn of the century:

> **I have been urging upon our people the following arguments. If we could by any measure buy out all competition and have an absolute monopoly in the field, it would not pay us. The essence of manufacture is steady and full product. The demand of the country for powder is variable. If we owned all therefore when slack times came we would have to curtail product to the**

> extent of diminished demands. If on the other hand we control only 60% of it and made the 60% cheaper than others, when slack times came we would still keep our capital employed to the full and our product to the maximum by taking from the other 40% what was needed for this purpose. In other words, you could count upon always running full if you make cheaply and control only 60%, whereas, if you own all, when slack times came you could only run a curtailed product. (76).

The successful firms were the ones who adopted this strategy of superior efficiency, not those who sought monopoly.

Yet many successful first movers were in fact broken up by the axe of early antitrust policy. Chandler is peculiarly silent about the virtue of these dismemberments. In fact, we are left with the strong impression that they were largely either irrelevant or positively harmful. For Chandler, the firms broken up – Du Pont along with Standard Oil and American Tobacco – were dynamic innovators who were building competitive advantage through rationalization and large-scale production. At best the breakups created several dynamic competitors where there had been few domestically (but of course several internationally). At worst, though, the breakups destroyed capabilities, and the fear of breakup deterred the building of capabilities. This last possibility Chandler thinks is a partial explanation for the failures of U. S. Steel, which declined to press its competitive advantages lest it suffer the fate of Standard Oil or Du Pont. (Judge Gary's personal aversion to competition is offered elsewhere as another part of the explanation.)

As to the Sherman Act itself, Chandler is suitably pious. He is puzzled by the ease of its passage, and assumes therefore that it "was more an expression of fundamental American values than a result of pressure groups at work"(72)[11]. Even if this is true, however, what was at work was a cultural aversion to bigness per se, not to inefficient restraints on trade. Unlike many other students of the history of antitrust," Chandler thinks that early enforcers were concerned not with ***size*** but with inefficiency, and spared those large combinations that increased output and lowered costs (79). Thus the only result of antitrust policy was to outlaw interfirm agreements. This, Chandler claims, had a profound effect on the shape of American industry. But, once again, it doesn't seem to have differentiated the U. S. from Germany in overall competitive competence.

The Capabilities Theory of the Firm

In many ways, of course, it should not be entirely surprising that antitrust policy is at best tangential to Chandler's account of the corporation. As I

have argued, Chandler's vision is one of dynamic competition, a vision, as Schumpeter emphasized, that is fundamentally at odds with the neoclassical picture of competition that forms the intellectual—if not necessarily the political—basis of antitrust policy. Neoclassical theory had its beginnings in the simple static models of price competition developed by the French mathematician Cournot in 1838. His wonderfully Gallic starting point was a mineral-water monopolist. Such a firm produces less and charges a price higher than is socially optimal. As the number of firms selling mineral water increases, the industry's output increases and prices decline until, with a large number of firms, they approach socially optimal levels. All later neoclassical models share this logical structure and this obsession with the numbers, what in the jargon is called market concentration. An obsession with price collusion, which could raise price and lower output for any given level of concentration, is the other neoclassical legacy to antitrust policy. None of this is to say that there is anything logically incorrect about the neoclassical theory. It is simply irrelevant to the world Chandler describes.

What theory *is* relevant? It is no accident, I think, that Chandler talks continually about the ***capabilities*** of the corporation. By using this language Chandler connects with a developing body of theory that might loosely be called the capabilities view of the firm,[13] a view that Chandler himself has influenced. Unlike the neoclassical theory, this approach does not take production in the economy to be a purely technical question, a matter of combining given inputs according to known blueprints. Instead, it sees economic activity as requiring skills and organization. Neither of these is in any sense "given." Economic actors must struggle with what Herbert Simon, in a famous phrase, called "bounded rationality."[14] And what those actors know is mostly know-how, the inarticulate form of knowledge Michael Polanyi described as "tacit."[15] As a result, capabilities—individual and organizational skills—develop in idiosyncratic and historically dependent ways.

In this view, competition is the learning process through which capabilities are created in the economy.[16] Sometimes the competitive process lends itself to the smooth augmentation of capabilities—a learning or experience curve. Sometimes, however, competition generates new capabilities that render obsolete existing bodies of skill and organization—Schumpeter's famous process of "creative destruction." Quite apart from its value as pure history, Chandler's work, in this book and before, is important for the attention it pays to the role of the corporation as an institution for the creation and preservation of economic capabilities.

A Paean Too Loud?

Scale and Scope helps to vindicate the large corporation of any charges of economic "sabotage" and indeed to raise that institution to a hallowed niche in the ideological pantheon of capitalism. One may worry, however, whether it has raised the corporation to somewhat too lofty a place. What has happened to "the market?" Where in Chandler are the benefits of coordination and knowledge-creation that so many writers have assigned to it?[17] One could easily read Chandler as suggesting that administrative coordination by hierarchies of trained professional managers has proven so effective as to render obsolete "the market" as traditionally understood.[18]

The difficulty here is not so much the cloak of power with which Chandler invests the corporation. Rather, the problem lies with Chandler's interpretation of the ***nature*** of that power. There are, in fact, two related problems with Chandler's vision, and both are arguably matters of emphasis. One is Chandler's too-exclusive focus on the corporate form as an institution for creating capabilities. The other is Chandler's vague and often misleading characterization of the "managerial" aspect of managerial capitalism.

"The market" is a term with many meanings. The idea that the large corporation has superseded "the market," and therefore that its success has rendered "the market" obsolete, is a deduction based in part on a confusion of two meanings of the word. It is true, as Ronald Coase long ago pointed out, that one can view the firm as having superseded the market." But by the market Coase meant coordination through price-mediated spot contracts. This is scarcely the same thing as "the market" in the political sense. The market in this larger sense means a system of private property and free contract, with minimal administrative intervention by the state. To have superseded the market in the narrow sense is not to have superseded the market in the larger sense. As Thomas Sowell has observed, there is too often tendency to "refer to 'the market' as if it were an institution parallel with, and alternative to, the government as an institution. The government is indeed an institution, but 'the market' is nothing more than an ***option*** for each individual to choose among numerous existing institutions, or to fashion new arrangements suited to his own situation and taste.""" The corporation is one of those arrangements that springs up within the confines of "the market."

Having said this, of course, the success of the large corporation might remain potentially troubling even if it reflects a fundamental supersession only of markets in the narrow sense. Happily, such would be a misreading of fact—and even of Chandler's story. Chandler argues that the success of the corporate form was linked to investments in high-throughput produc-

tion and mass distribution. In many if not most cases, this certainly implied integration of manufacturing functions and the elimination of middlemen. But it did not really imply massive vertical integration. The corporation often took purchasing out of the hands of brokers and middlemen—but it **still** purchased components and inputs. For the most part, Chandler seems to think, vertical integration was (and ought to be) merely "defensive,"that is, designed to ensure secure flows of components, materials, and sales. Integration beyond this has no economic function, and, as in the case of Ford in th1920s, can be positively dysfunctional.

Reading ***Scale and Scope*** carefully, one sees that, although the corporation ***led*** economic growth, it was supported at every stage by an increasingly dense network of market relations. The auto industry relied (and continues to rely) on thousands of parts suppliers. That industry as well as agricultural equipment relied on franchised dealers for retail sales. Consider also the railroads, which Chandler has described as the seedbed of managerial capitalism.[21] Despite their systemic character, railroads were quite able to manage via contracts a nationwide network of independently owned lines. Moreover, tankers, refrigerated cars, and other special facilities were owned by shippers, not the railroads. And the entire business of passenger travel was under contract to Pullman. Thus, Chandler's account provides a kind of back-door or second-hand tribute to markets as agents of economic growth.

Capabilities and Economic Change

To put markets and "administrative hierarchies" in their proper perspective, however, we need to turn back to Schumpeter. That is, we need to look at how markets and hierarchies generate and respond to economic change and innovation?' This is something Chandler's history will help **us** with, even if his analytical framework disguises some important issues.

First of all, we need to give markets—"the market" in the narrow sense—more credit as repositories and generators of economic capabilities. The price system is an often elegant mechanism for linking together decentralized capabilities, one that has a marvelous ability to economize on information transmission.[23] But it is wrong to think that markets use ***only*** price information. Contracting requires many other kinds of messages, which are often transmitted in the same manner as in a firm. In short, as Alfred Marshall understood, both firms and markets "are structures for promoting the growth of knowledge, and both require conscious organization."[24] The issue is this. How do firms and markets, both understood as complex organizations, generate and respond to various kinds of change?

The answer depends on the structure of the change involved. In some

cases, the virtues of markets—their decentralization—can be a vice. When change is "systemic,"[25] that is, when it requires simultaneous and coordinated adjustments in many different spheres of activity, a decentralized system may prove harder to nudge onto a new path than a system under unified ownership. This may be so because of vested interests or simply because it is more costly to inform and persuade many independent agents than simply to do it oneself.[26] Such costs may be especially high in the case of large-scale systemic innovation, since, because the capabilities required to make the innovation work are new virtually by definition, those capabilities are simply not available for purchase on the market. An example would be Henry Ford's moving assembly line. Because of this systemic change in the way parts were assembled, it was cheaper for Ford to make the parts himself than to teach the innovation to outside suppliers; and what had been a highly disintegrated industry became a highly integrated one.[27] Followers like General Motors, however, could take advantage of the eventual spread of Ford's ideas to the market, and needed far less vertical integration.

In short, then, the coordinating virtues of managerial capitalism lie not, as Chandler frequently implies, in the ability of managers rationally to plan and coordinate high-volume throughput. In a static world, markets can do that just fine. The real virtue of an internal hierarchy rests in its ability to effect large-scale rearrangements of economic capabilities in certain circumstances—to make, as Chandler would put it, the necessary large-scale investments in mass production and distribution. The role of professional management in this process is, in fact, a centrifugal not a centripetal one. Once the large-scale investments have been made, once the economic capabilities have been forcibly rearranged, the imperative then becomes one of *decentralization.* This is so for all the reasons now well known to erstwhile socialist regimes. As Chandler has documented, the successful firms were the ones which not only invested in new capabilities but also adopted the so-called multidivisional (or M-form) structure. Under this system, day-to-day decision making is removed from the lap of top management and deposited with separate operating divisions, each of which "could theoretically act as an independent business enterprise"(14). Successful administrative coordination turns out to involve a kind of simulation of the market. Indeed, the problem with British personal capitalism was not that the British firms were too market-like but rather the opposite: in trying to run far-flung enterprises from small central offices, the British were encountering the fundamental problems of central planning.

The M-form structure does, however, differ from the market (that is, from a set of fully independent enterprises) in one important respect. Top management of the multidivisional corporation retains the crucial strategic

function. The job of top management is to take the longer view and to reshape the firm's capabilities when necessary. This means, among other things, seeking out new markets and abandoning declining ones. Bogged down in day-to-day management, the non-divisionalized British capitalists lacked the longer-run perspective of their American and German counterparts, and were unable to act entrepreneurially. As Frank Knight understood long ago, the real ***raison d'être*** of the corporate form is its ability to change and react to change. "When uncertainty is present," he wrote, "and the task of deciding what to do and how to do it takes the ascendancy over that of execution, the internal organization of the productive groups is no longer a matter of indifference or a mechanical detail. Centralization of this deciding and controlling function is imperative, a process of 'cephalization,' such as has taken place in the evolution of organic life, is inevitable, and for the same reasons as in the case of biological evolution."[28]

Markets As Networks of Capabilities

Lest the reader think I havejoined Chandler in the adoration of the corporation, however, let me add a dollop of perspective. The successful creation of capabilities within the corporation, I have argued, is likely when it is somehow costly to acquire access to those capabilities though decentralized market arrangements. This would be the case when either the capabilities available in the market are very different from those the entrepreneur requires or, what is a special case of the same thing, when market capabilities are simply few or non-existent. How costly it is to develop capabilities in the market may in turn depend on how quickly the market is asked to develop those capabilities. This suggests that the extent of vertical integration—the extent of the primacy of the corporation—may depend not so much on the extent of the market or the level of technical advance as on the ***rate of change*** of demand and technology.[29] Thus an industrial leader that came to primacy slowly may be less "corporate" than a follower nation industrializing quickly along a well-marked path. And the supremacy of the large enterprise in, say, the nineteenth-century United States or present-day Korea may reflect less the inherent virtues of the corporation than the relative paucity of market capabilities in those follower economies.

More significantly, there may be reasons why markets are a superior form of organizational capabilities for economies at the leading edge of development. Advance in such economies comes from pushing forward the frontier, not from imitating. The kinds of uncertainties involved are much more serious. In such an environment, knowledge and capabilities arguably advance more rapidly when there is a diversity of simultaneous approaches.[30] This may be more likely in a world of many independent

organizations. It may well be, of course, that the corporation, with its large-scale investments in complementary assets, may be best able to exploit new developments once their outlines have become clear enough for managers to react strategically?' But markets may often be indispensable for making advances possible in the first place, especially when those advances involve the radically new. Silicon Valley obviously comes to mind.

The advantages of a decentralized market network are greater the smaller the costs of coordinating change across the network. When change is not systemic but autonomous—that is, when change can take place locally without affecting the larger system—the coordinating benefits of administrative hierarchies are of little value. When can change be autonomous? When the system is a modular one, in which common standards guide the connections among the parts. Examples would include the microcomputer, with its modular bus and standard operating system, as well as a number of mechanical industries in which standards permit the use of off-the-shelf parts. In the case of such modular systems, the market is often able to organize capabilities far more extensive than even the largest corporation could marshal.[32]

Indeed, large corporations are often a central part of such networks. This may be particularly true in Japan, where, as Ken-ichi Imai has argued, the large corporation practices "network industrial organization" rather than vertical integration in the American mold.[33] The large concern is the so-called ***kaisha*** or lead firm, which orchestrates the capabilities of the network. Even in the product-development stage, the Japanese corporation relies heavily on the market, reaching for standard off-the-shelf parts to a far greater extent than in the U. S.[34] One might argue that this system is a further advance of "cephalization" in Knight's sense, a structure that, as Imai describes it, is not only obsessed with learning but which learns in a decentralized way.[35]

The Present and Future

Chandler does not deny that the fundamental source of competitive capability in the corporation has changed over time. He agrees with other writers[36] that, since World War II, the source of competitive advantage in the large corporation—and with it the source of industrial leadership in the U. S.—has shifted from the exploitation of economies of scale to the exploitation of economies of scope. By this he means that advantages grounded in high-throughput manufacturing and distribution have increasingly given way to advantages grounded in the extension of capabilities into domains that are secondary to the initial business.[37] Originally, such economies of scope were of the sort understood by neoclassical

theory. For example, meat packing firms took advantage of the by-products of their trade to move into leather, soap, fertilizer, etc. Beginning with the late nineteenth-century German dyestuffs industry, however, firms took advantage of economies of scope grounded in generic technological and marketing capabilities, which had often been created or bolstered by formal research and development. Du Pont used its knowledge in making and marketing explosives to move into a wide range of chemicals; General Motors used its capabilities in internal-combustion engines to create the diesel-locomotive industry; and General Electric and Westinghouse used their knowledge of electric generators and motors to enter the manufacture of a broad array of electrical equipment. This process of related diversification fueled by R&D was particularly important to the success of American firms after the Second World War.

Chandler does not extend his history to this later period, but he does provide a speculative chapter on present-day developments, including the debate over American competitiveness now raging. A kind of successor to the British entrepreneurial-failure debate, the modern discussion worries that Japan (perhaps with various Asian NICS in tow) will come to outpace the U. S. in the Third Industrial Revolution the way America outpaced Britain in the Second. This new industrial revolution is based on post-World War II innovations in aviation and electronics that, like railroads and the telegraph before them, lowered costs of transportation and communication. Chandler is not upbeat. Despite notable successes like IBM, he thinks, the recent evolutionary trend in American managerial capitalism has not been a healthy one.

Things began to go wrong in the 1960s with the wave of conglomerate diversification, that is, with diversification by companies into areas wholly unrelated to their "core competence."[38] ITT was the paradigm of this phenomenon. Originally an international maker of telephone switching equipment, it bought, among other things, an insurance company and the maker of Hostess Twinkies. Chandler sees this as an inefficient practice, with many of the disbenefits of overextended British personal capitalism. There is no historical precedent for such unrelated diversification, he notes, except for German ***Konzerne*** during the hyperinflation of the 1920s. What is interesting—and what Chandler doesn't mention—is that it is precisely inflation, in this case the Lyndon Johnson inflation of the 1960s, to which many have pointed as the cause of the wave of conglomerate mergers. The conglomerate is in effect an "internal capital market" that invests in a diversified portfolio of unrelated interests.[39] But why? The stock market is much better at diversifying away risk than is such an arrangement, and it has many other advantages as well. In a time of inflation, the argument goes, price signals become distorted as managers

find it difficult to disentangle changes in relative prices (that is, real prices) from changes in the price level. In such a world, the internal information and control within a conglomerate may have advantages that outweigh the disadvantages.[40]

But, in any case, the trend in the less-inflationary 80s was the opposite one, the breaking apart of corporate holdings. This, along with institutional investing, the market for corporate control, and various other financial innovations of the last decades, Chandler also finds troubling. With all this attention to buying and selling corporations, he fears, the economy may be sacrificing long-term investment in capabilities for short-term gain. Notice that we have come full circle from Berle and Means. Instead of worrying that managers might plunder stockholders, Chandler is anxious to protect farsighted managers from the plunder of nearsighted owners.[41]

Chandler is certainly right that the creation and maintenance of capabilities is the important issue in the American competitiveness debate. He may well be right about the effects of corporate finance. On the other hand, he presents little evidence to back up his speculations. One also cannot help remembering that earlier waves of financial remodeling of the economic system were equally worrisome to contemporaries. Rationalization—creative destruction—is not a tidy business. We may not know the answer until Chandler (or his successor) writes the sequel to *Scale and Scope,* a sequel whose vision of the capitalist dynamic encompasses, but does not limit itself to, the large corporation of the late nineteenth and early twentieth centuries.

NOTES

1. Adolf A. Berle, Jr., and Gardiner C. Means, The *Modern Corporation and Private Property* (New York: Macmillan, **1932).**

2. As I will suggest below, neoclassical theory still addresses the issue of concentration in much the same static way it did in the **1930s.** On the issue of the separation of ownership from control, however, modern theory has produced a spirited and persuasive defense of the corporate form. It is true, the theory holds, that such separation creates costs, what are now termed the agency costs of managers pursuing goals different from those of the owners. But such costs are in fact mitigated by a number of devices, including stock markets (in which stockholders vote with their feet); the market for managerial talent (which rewards conscientious managers and penalizes bad ones); boards of directors; and the market for corporate control (that is, the threat of a takeover). More telling, however, is the observation that Berle and Means neglected the *benefits* of the separation of ownership from control. Unbundling the two functions allowed efficient specialization into management and risk-bearing. The first of these spe-

cializations is an important theme of this essay. The latter—specialization in ownership—lowered the cost of capital dramatically by tapping the funds of small investors uninterested in management. It also reduced risk for all investors by permitting them more easily to diversify their portfolios. See Michael C. Jensen and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3 (1976): 305-60.

3. Joseph A. Schumpeter, ***Capitalism, Socialism, and Democracy*** (New York: Harper and Brothers, **1942).**
4. Ibid., **82.**
5. Ibid., **83.**
6. Indeed, some would credit Chandler with having single-handedly created the present-day field of business history.
7. The most important of his earlier works are ***Strategy and Structure*** (Cambridge, Mass.: MIT Press, **1962)** and especially ***The Visible Hand: The Managerial Revolution in American Business*** (Cambridge, Mass.: The Belknap Press of Harvard University Press, **1977).**
8. In neoclassical theory, economies of scope exist in the "production function" when it is cheaper per unit to produce (or distribute) two different goods together than to produce (or distribute) them separately. For example, there may be economies of scope to growing apples and producing honey together, since the bees pollinate the apple trees and the trees provide food for the bees. (Whether such economies of scope require joint ownership of the relevant assets is another matter. See David J. Teece, "Economies of Scope and the Scope of the Enterprise," *Journal of Economic Behavior and Organization* 1, no. *3* [1980]: 223-47.) Although he cites the neoclassical literature, however, Chandler does not in fact mean by this term what neoclassical writers mean, a point I cannot develop here. The term is useful as a metaphor, however.
9. Nathan Rosenberg, "Why in America?" in Otto Mayr and Robert Post, eds., ***Yankee Enterprise: the Rise of the American System of Manufactures*** (Washington, D.C.: Smithsonian Institution Press, 1981); Richard R. Nelson, "U. S. Technological Leadership: Where Did It Come From and Where Did It Go?" ***Research Policy*** 19, no. 2 (April 1990):117-32; and Gavin Wright, "The Origins of American Industrial Success, 1879-1940," ***American Economic Review*** 80 (September **1990):651-8.**
10. For an excellent bibliography of which, see S. B. Saul, ***The Myth of the Great Depression, 1873-1896*** (London: Macmillan, 2nd ed., **1985).**
11. For a contrary view, see Thomas J. DiLorenzo, "The Origins of Antitrust: Rhetoric vs. Reality," ***Regulation*** 13, no. 3 **(Fall 1990):26-34.**
12. See, for example, Robert Bork, ***The Antitrust Paradox: A Policy at War with Itself*** (New York: Basic Books, 1978).
13. In addition to some of the works cited below, see Richard R. Nelson and Sidney G. Winter, ***An Evolutionary Theory of Economic Change*** (Cambridge,

Mass.: The Belknap Press of Harvard University Press, 1982) and G. B. Richardson, "The Organisation of Industry," ***Economic Journal*** **82 (1972): 883-96.**

14. Herbert A. Simon, ***Models of Bounded Rationality,*** vol. 2 (Cambridge, Mass.: MIT Press, **1982).**
15. Michael Polanyi, ***Personal Knowledge*** (Chicago: University of Chicago Press, **1958).**
16. **F.** A. Hayek has long argued that the discovery of new knowledge—not the setting of some optimal price with given knowledge—is the essence of competition. See his "The Meaning of Competition,'' in his ***Individualism and Economic Order*** (Chicago: University of Chicago Press, **1948)** and "Competition as a Discovery Procedure," in his ***New Studies in Philosophy, Politics, Economics, and the History of Ideas*** (Chicago: University of Chicago Press, **1978).** See also Paul J. McNulty, "Economic Theory and the Meaning of Competition," ***Quarterly Journal of Economics*** **82 (1968):639–56.**
17. Most notably F. A. Hayek, "The Use of Knowledge in Society,"***American Economic Review*** **35,** no. **4 (1945):519-30.**
18. This is a leap of logic that John Kenneth Galbraith took long ago in ***The*** New Industrial State (Boston: Houghton-Mifflin, 1967). William Lazonick, a Marxian–influenced disciple of Chandler, has recently put forward a more subtle and sophisticated version of this thesis. See his ***Business Organization and the Myth of the Market Economy*** (New York: Cambridge University Press, **1991).**
19. Ronald H. Coase, "The Nature of the Firm," ***Economica*** (N.S.) **4** (November **1**937):386-405.
20. Thomas Sowell, ***Knowledge and Decisions*** (New York: Basic Books, 1980), 41, emph. original.
21. In ***The Visible Hand*** to a greater extent than in ***Scale and Scope.***
22. In fact, this distinction greatly—and sometimes dangerously—oversimplifies the world. Markets and hierarchies are in fact complex institutions that come in many, often overlapping, varieties. But the distinction will do for present purposes.
23. Hayek, "The Use of Knowledge in Society."
24. Brian J. Loasby, "Firms, Markets, and the Principle of Continuity," in J. K. Whitaker, ed., ***Centenary Essays on Alfred Marshall*** (Cambridge: Cambridge University Press, **1990),120.**
25. This terminology is from David Teece, "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy," ***Research Policy*** 15 (December 1986):285-305.
26. Morris Silver, ***Enterprise and the Scope of the Firm*** (London: Martin Robertson, 1984).
27. Richard N. Langlois and Paul L. Robertson, "Explaining Vertical Integration: Lessons from the American Automobile Industry," Journal ***of Economic*** History 49, no. 2 (June 1989): 361-75.

28. Frank H. Knight, ***Risk, Uncertainty, and Profit*** (Boston: Houghton Mifflin, 1921), 268. For an analysis of the M-form in terms of cybernetic theory, see Oliver E. Williamson, ***The Economic Institutions of Capitalism*** (New York: The Free Press, 1985).
29. Richard N. Langlois, "Economic Change and the Boundaries of the Firm," ***Journal Of Institutional and Theoretical Economics*** 144, no. 4 (November 1988): 635-57.
30. Richard R. Nelson and Sidney G. Winter, "In Search of More Useful Theory of Innovation," ***Research Policy*** 5 (Winter 1977):36-76.
31. Teece, "Profiting from Technological Innovation."
32. See Richard N. Langlois and Paul L. Robertson, "Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries," ***Research Policy,*** forthcoming.
33. Ken-ichi Imai and Hiroyuki Itami, "Interpenetration of Organization and Market: Japan's Firm and Market in Comparison with the U.S.," ***International Journal of Industrial Organization*** 2 (1984):285-310, and Imai, "Network Industrial Organization in Japan," in Bo Carlsson, ed., ***Industrial Dynamics: Technological, Organizational, and Structural Changes in Industries and Firms*** (Dordrecht: Kluwer, 1989), 123-55.
34. Anonymous, "What Makes Yoshio Invent," ***The Economist,*** January 12, 1991: 61.
35. Ken-ichi Imai, Ikujiro Nonaka, and Hirotaka Takeuchi, "Managing the New Product Development Process: How Japanese Companies Learn and Unlearn," in Kim B. Clark, Robert H. Hayes, and Christopher Lorenz, eds., ***The Uneasy Alliance: Managing the Productivity-Technology Dilemma*** (Boston: Harvard Business School Press, 1985).
36. See especially Nelson, "U. S. Technological Leadership."
37. As Edith Penrose argued many years ago, a prime motive for the growth and diversification of firms is their possession of "excess capacity," especially excess technical and managerial capacity, which can be put to use profitably in related areas. See Penrose, ***The Theory of the Growth of the Firm*** (Oxford: Basil Blackwell, 1959).
38. C. K. Prahalad and Gary Hamel, "The Core Competence of the Corporation," ***Harvard Business Review*** (May-June 1990):79-91.
39. Williamson, ***Economic Institutions.***
40. For empirical evidence of this effect, see Donald J. Boudreaux and William F. Shugart, II, "The Effects of Monetary Instability on the Extent of Vertical Integration," ***Atlantic Economic Journal*** 17, No. 3 (June 1989): 1-10.
41. This is not, of course, a view peculiar to Chandler. It is widely held in various forms. Lazonick ***(Business Enterprise)*** presents an unabashed version that builds on Chandler's concerns. In fact, this view was also well known at the time Berle and Means wrote, having been popularized by Thorstein Veblen, ***The Engineers and the Price System*** (New York: Viking, 1924).