Innovative Enterprise and Historical Transformation

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The social conditions that affect innovation change over time and vary across productive activities. Hence theoretical analysis of the innovative enterprise must be integrated with historical study through the use of what I call a historical-transformation methodology—a methodology that stands in sharp contrast to, but can nonetheless be complemented by, the constrained-optimization methodology favored by conventional economists. In surveying some major attempts to analyze the role of the business enterprise in generating superior economic performance in the advanced economies, including the works of Oliver Williamson, Alfred Chandler, Edith Penrose, and resource-based theorists, I explain what a historical-transformation methodology is and why such a methodology is needed for understanding how and under what conditions business enterprises can in fact be innovative enterprises.

Innovation is central to the process of economic development. The social conditions affecting innovation change over time and vary across productive activities; hence theoretical analysis of the innova-

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tive enterprise must be integrated with historical study. A theory of innovative enterprise requires an understanding of the historical process that is sufficiently broad and deep so that the assumptions and relations that form the substance of the theory capture the essential reality to which the theory purports to be relevant. The development of relevant theory requires an iterative intellectual approach in which theoretical postulates are derived from the study of the historical record and the resultant theory is used to analyze history as an ongoing and unfolding process. I call this analytical approach the historical-transformation methodology.

There are strong intellectual traditions in economics, including those stemming from the work of Karl Marx, Alfred Marshall, and Joseph Schumpeter, that have recognized the need to integrate theory and history to understand the role of the business enterprise in the process of economic development. Nevertheless, for at least the past half century, the overwhelmingly dominant methodology within the economics discipline has been "constrained optimization," a methodology that, taken on its own, is antithetical to a historical-transformation methodology. Yet there is no inherent reason why the two methodologies cannot be combined to help us understand the process of economic development. As part of a process of understanding how technological and market conditions change over time, it can be very useful to examine how and to what extent economic actors, be they individuals, businesses, or governments, do or do not optimize, subject to these conditions at a point in time, in making resource allocation decisions. Insofar as the analytical problem is to explain the process of economic development, however, the historical-transformation methodology will dominate the constrained-optimization methodology because the process of economic development is fundamentally about how economic actors transform technological and market conditions over time. It is not therefore surprising that the obsession of economists with constrained optimization to the exclusion of historical transformation as a mode of economic analysis is bound up with a neglect of the process of economic development as a central intellectual concern.²

A methodological penchant for constrained optimization is also conducive to an ideological attachment to the market mechanism as the preferred mode of resource allocation in the economy, because a

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cgep). I am grateful to Louis Galambos and Mary O'Sullivan for comments on various drafts, as well as to Pat Denault for editorial assistance and advice.

2. Ibid.
reliance on the market to allocate resources undermines the ability of particular economic actors to exercise extraordinary control over the resource allocation process. Yet the existence in the advanced economies of not only strong governments but also powerful business enterprises—many of which employ tens of thousands and some even hundreds of thousands of people—raises questions about the roles of organizations and markets in generating superior economic performance. A theory of innovative enterprise posits that, under certain conditions, at certain times, and in certain industries, a business enterprise can exert its power over the allocation of labor and capital to transform the technological and market conditions that it faces at a given time to generate higher-quality, lower-cost products over time.

It follows from this definition that an optimizing firm that takes technological and market conditions as given in making its resource allocation decisions cannot generate innovation. The relation between an innovative enterprise and an optimizing firm can be modeled by asking how, by transforming technological conditions, market conditions, or both, a small number of innovative enterprises might be able to differentiate themselves from other firms in an industry to gain sustained competitive advantage. The innovative enterprise becomes dominant by transforming the industry cost structure and producing a larger volume of output that it can sell at lower prices than the industry's optimizing firms. By confronting and transforming technological and market conditions rather than accepting them as constraints on its activities, the innovative enterprise can outperform the optimizing firm. By expanding output and lowering prices, the innovative enterprise grows to be larger than the optimizing firm.

In a theory of innovative enterprise, however, a dominant firm is not necessarily a monopolist that, as in the neoclassical theory of the optimizing firm, restricts output and raises prices. Rather, as through a process of historical transformation the innovative enterprise develops the capability to generate higher-quality products than its competitors, it also has an interest in lowering prices as part of a strategy to increase the extent of the market available to it, which in turn lowers unit costs further as the enterprise reaps economies of scale. Through the transformation of technological and market conditions,

3. Ibid., chap. 3.
the innovative enterprise has the potential not only of outperforming the "perfectly competitive" firms of neoclassical theory but also of generating sufficient surplus revenues to pay higher wages to employees and higher returns to other stakeholders such as suppliers and stockholders. The innovation process, that is, can overcome the "constrained-optimization" tradeoffs between consumption and production in the allocation of resources and between capital and labor in the allocation of returns.

The purpose of this article is to survey some major attempts to analyze the role of the business enterprise in generating superior economic performance in the advanced economies, and, in the process, to illustrate the need for a historical-transformation methodology for understanding how and under what conditions business enterprises can in fact be innovative enterprises. The next section summarizes the transaction-cost approach of Oliver Williamson, which has been put forth to explain how the coordination of economic activity by organizations (that is, "hierarchies") rather than by markets affects economic performance. Williamson's objective is to explain the existence of the modern corporate enterprise. Using the concepts of asset specificity, bounded rationality, and opportunism, I show that he argues that the modern business enterprise is a response to "market imperfections" rather than a manifestation of "organizational success." To make this argument, he employs a constrained-optimization methodology that, in effect, excludes the innovation process from his analysis. Yet, I go on to argue, a historical-transformation methodology permits us to treat Williamson's key analytical categories as conditions that, through organization, the business enterprise can transform rather than accept as given constraints on its behavior and performance, thus making it possible to use the Williamsonian framework for constructing a theory of innovative enterprise.

Next I will turn to the pioneering contributions of Alfred D. Chandler, Jr., and Edith Penrose—one coming from history, the other from economics—to a theory of innovative enterprise as applied to the modern industrial corporation. I will argue that, while Chandler documented the centrality of the industrial corporation as an economic actor in the advanced economies over the course of the twentieth century, his attempts (through the early 1990s at least) to explain the growth and persistence of the business enterprise have focused too much on the utilization of the productive capabilities under the control of the enterprise, to the neglect of the processes that develop the productive capabilities that the enterprise has under its control. Penrose, in *The Theory of the Growth of the Firm*, first published in 1959, sought to understand the same phenomenon as Chandler had,
but her analysis focused much more on the development of productive capabilities, while assuming little if any problem in their utilization.

I then survey some of the resource-based theories of the firm that, influenced by the work of Chandler and Penrose, have sought to explain why some firms in an industry are able to attain and often sustain competitive advantage over others. I argue that, to progress from describing the advantageous positions of particular enterprises at a point in time to explaining the processes that allow them to attain and sustain these positions over time, those theories require a historical-transformation methodology. I conclude this article with some observations on what it means to integrate theory and history, and hence what in practice a historical-transformation methodology entails.

The Modern Corporation: Optimizing Firm or Innovative Enterprise?

Williamsonian Transaction-Cost Theory

The roles of cognitive abilities and behavioral incentives in the organization and performance of the enterprise have been at the core of the transaction-cost theories of the firm that have gained a considerable following in recent years. These theories have their origins in “The Nature of the Firm,” an article published by Ronald Coase in 1937. Coase’s aim was to construct a theory of the firm that would be both realistic and tractable. By realistic, Coase meant a theory that could account for the allocation of economic resources internally within firms rather than in the market via the price mechanism. By tractable, Coase meant that “the nature of the firm” could be analyzed using the Marshallian tool of “substitution at the margin.” Hence, Coase assumed that “the nature of the firm” could be understood as an optimization problem and that constrained optimization therefore provided an adequate methodology for analyzing the conditions under which firms rather than markets allocate resources in the economy.

Coase argued that the firm differs from the price mechanism as a distributor of resources because within the firm such allocations occur through “conscious power.” As Coase put it, “If a workman moves

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from department Y to department X, he does not go because of a change in relative prices, but because he is ordered to do so." But," Coase asked, "in view of the fact that it is usually argued that coordination will be done by the price mechanism, why is such organization necessary? . . . Our task is to discover why a firm emerges at all in a specialized exchange economy."

Coase answered this question by pointing out that there are costs of using the market—that is, transaction costs. Participants in the economy have to discover what relative prices are, they incur costs in negotiating and enforcing contracts for each separate market transaction, they face uncertainty in relying on market relations when planning is required, and they may face taxes on market transactions that could be avoided by organizing the transactions within a firm. The firm arises and then augments its coordinating functions when the cost of organizing these functions internally is less than the cost of using the market.  

Influenced by Coase's contribution, scholars have produced a vast literature on transaction-cost economics, dominated by the theoretical work of Oliver Williamson. Since the 1960s Williamson has sought to elaborate a theory of the firm that applies to the organization and performance of the modern corporation. Like Coase, Williamson has sought to explain why, in a "market economy," hierarchies rather than markets might organize economic activity. Also like Coase, he has conceived of those hierarchies as optimizing firms.  

Unlike Coase, however, Williamson locates transactions, and hence transaction costs, not only in market exchange but also within the firm. Therefore, to assess the relative performance of markets and hierarchies in allocating resources, one must compare the transaction costs of the two different modes of economic organization. Williamson attributes "transaction costs" to a behavioral condition that, following Kenneth Arrow, he calls "opportunism" and a cogni-
tive condition that, following Herbert Simon, he calls “bounded rationality.”¹⁰ Williamson’s inclusion of these behavioral and cognitive conditions as central to the theory of the firm marks his contribution as an important advance over prior theories of the optimizing firm, which treated technological and market conditions as if they were devoid of organizational implications.

Williamson defines “opportunism” as a condition of “self-interest seeking with guile.” “Opportunism,” says Williamson, “refers to the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse.”¹¹ Yet such opportunism becomes a problem only in the presence of bounded rationality. In entering into transactions, economic actors have incomplete access to information and a limited ability to absorb that information to which they do have access. They make decisions that they intend to be rational—by which Williamson means to minimize costs—but they have a limited cognitive competence to do so. Bounded rationality is this condition of being “intendedly rational but only limitedly so.”¹² With unbounded rationality, economic actors would not be reliant on others for information. Indeed, absent limits to their cognitive competence, decision makers would know the opportunistic propensities of other actors and could simply avoid entering into transactions with those known to be prone to “self-interest seeking with guile.”

The critical phenomenon that links the condition of bounded rationality with the condition of opportunism is uncertainty, both cognitive and behavioral. The possibility of unforeseen “disturbances” in the economic environment creates the need for “adaptive, sequential decision making,” and markets and hierarchies “differ in their capacities to respond effectively to disturbances.” If rationality were unbounded, the changing environment would not create cognitive uncertainty and pose problems of adaptation, because “it would be feasible to develop a detailed strategy for crossing all possible bridges in advance.”¹³ The occurrence of these unforeseen disturbances creates opportunities for one party to a transaction to take advantage of the other. In the presence of parties to transactions who are looking for the opportunity to seek their own self-interest in deceitful, dishonest, or guileful ways, cognitive uncertainty is transformed into behavioral uncertainty—that is, “uncertainty of a strategic kind . . . attributable to opportunism.” As Williamson goes on to argue, “Be-

10. Williamson, Economic Institutions of Capitalism, 8, 45.
11. Ibid., 47.
12. Ibid., 45.
13. Ibid., 56–57.
havioral uncertainty would not pose contractual problems if transactions were known to be free from exogenous disturbances, since then there would be no occasion to adapt and unilateral efforts to alter contracts could and presumably would be voided by the courts or other third party appeal.”

So what does the interaction of bounded rationality and opportunism tell us about the choice between markets and hierarchies, and hence about the activities in which a firm will engage as an alternative to using the market? Given the behavioral condition of opportunism and the cognitive condition of bounded rationality, individuals who want to minimize transaction costs should choose to organize their transactions through markets rather than through hierarchies. Markets permit those entering into a contract to attenuate opportunism by switching to other parties, and to operate within the constraint of bounded rationality by engaging in adaptive, sequential decision making.

Why then do firms exist and grow in a modern economy? The critical condition favoring hierarchies over markets, according to Williamson, is “asset specificity.” Williamson introduced asset specificity into his argument as a deus ex machina when it became apparent that the assumptions of opportunism and bounded rationality provided an explanation for why markets, not hierarchies, would organize transactions. The problem that Williamson wanted to explain, however, was why, given the possibility of organizing transactions by markets, hierarchies—that is, business organizations—exist. As Williamson himself puts it, “The absence of asset specificity [would] vitiate much of transaction cost economics.”

Asset specificity is inherent in “transaction-specific durable assets,” both human and physical, that cannot be deployed to alternative uses—that is, to other transactions—without incurring a financial loss. Williamson distinguishes between physical asset specificity and human asset specificity. Physical asset specificity can exist because of what he calls “site specificity”—the physical immobility of invested resources that have been located in a particular place

17. Williamson, Economic Institutions of Capitalism, 56.
to be near a particular supplier or buyer—or because of “dedicated assets”—the special-purpose nature of capital goods (even if they can be easily moved), especially when the investments have been made to service a limited segment of the market (in the extreme, a particular buyer). Human asset specificity can exist because of the need for continuity (“learning by doing”) or collectivism (“team configurations”) in the development of human resources.  

Generally, assets involved in any specific transaction are imbued with “specificity” by the participation of particular parties in the transaction—as investors, workers, suppliers, or buyers. “Faceless contracting,” characteristic of market transactions, is, according to Williamson, “supplanted by contracting in which the pairwise identity of the parties matters.” As a result, transaction-specific assets cannot be reallocated to another use without a loss. Therefore, to generate revenues from these assets, the party that has invested in them requires continuity in his or her ability to utilize them. In effect, asset specificity is a form of Marshallian fixed costs that requires that the asset be utilized for a high “frequency” of transactions if total fixed costs are to be transformed into low unit costs. In Williamson’s framework, however, the governance of these transactions in the presence of asset specificity is critical to minimizing costs because, with bounded rationality, the participation of particular parties in transactions creates the possibility for opportunist behavior.

Nonmarket transactions exist, therefore, because of asset specificity. In the presence of bounded rationality and opportunism, achieving the optimal governance of these relations requires minimizing transaction costs. According to Williamson, “Transactions, which differ in their attributes, are assigned to governance structures, which differ in their organizational costs and competencies, so as to effect a discriminating (mainly transaction cost economizing) match.” Specifically, he hypothesizes that “market contracting gives way to bilateral contracting, which in turn is supplanted by unified contracting (internal organization) as asset specificity progressively deepens.”

But, when confronted with asset specificity, opportunism, and bounded rationality, why does internal organization outperform market contracting? According to Williamson, the economic virtues of internal organization lie in its relative ability to “work things out”: “Whenever assets are specific in nontrivial degree, increasing the de-

18. Ibid., 34, 55–56, 95–96, 104.
19. Ibid., 62; also 69, 195.
20. Ibid., 52, 60, 72–73.
22. Ibid., 78; see also 42.
gree of uncertainty makes it more imperative that the parties devise a machinery to ‘work things out’—since contractual gaps will be larger and the occasions for sequential adaptations will increase in number and importance as the degree of uncertainty increases."23 The internal governance structures that "work things out" add to the fixed costs of internal organization, thus requiring that those costs be spread over larger numbers of transactions (which presumably result in more units of revenue-generating output) to obtain lower unit governance costs.24 As the frequency of transactions organized by a particular governance structure increases, economies of scale and scope appear. But these economies are not the result of spreading out the costs of indivisible technology, the fixed entrepreneurial factor, or both, as post-Marshallian economists assumed. Rather, Williamson contends, these economies of scale and scope are the result of economizing on the combined costs of asset-specific investments and the governance structures needed to "work things out" in the face of opportunism and bounded rationality.

The primary virtue of Williamson's transaction-cost theory of the firm in contrast to the conventional theory is his focus on relationships among people who have specified cognitive and behavioral characteristics. The main problem with his theory is his use of the constrained-optimization methodology to analyze the organizational and performance implications of bounded rationality, opportunism, and asset specificity. Williamson takes these cognitive, behavioral, and technological conditions as given, and he asks how those who control corporate resources optimize subject to these conditions as constraints. Hence Williamson's perspective contains no theory of innovative strategy—that is, a strategy for confronting and transforming the constraining conditions.25 Indeed, Williamson specifically denies the importance of strategic corporate behavior in the evolution of the U.S. economy in the twentieth century (to which his transaction-cost analysis purportedly applies). In any case, he makes it clear that he views corporate strategy as inherently predatory behavior that would raise prices and restrict output, whereas a theory of innovative enterprise sees corporate strategy as integral to an innovation process that can lower prices and expand output.26

23. Ibid., 60; see also 79, 151, 204.
24. Ibid., 60; also 72–73.
25. See the discussion in Lazonick, Business Organization, chaps. 6 and 7.
26. To quote Williamson: "Suffice it to observe here that strategic behavior has relevance in dominant firm or tightly oligopolistic industries. Since most of the organizational change reported [here] occurred in nondominant firm industries, appeal to strategic considerations is obviously of limited assistance in explaining the reorganization of American industry over the past 150 years." Wil-
From Transaction-Cost Theory to Innovation Theory

In taking "asset specificity" as a given constraint on the behavior and performance of the firm, Williamson avoids the analysis of the characteristics of an innovative enterprise. As he himself recognizes explicitly: "The introduction of innovation plainly complicates the earlier-described assignment of transactions to markets and hierarchies based entirely on an examination of their asset specificity qualities. Indeed, the study of economic organization in a regime of rapid innovation poses much more difficult issues than those addressed here."27 By portraying corporate strategy as solely predatory behavior and the organization of transactions by "hierarchies" as a second-best solution to their organization by markets, Williamson's transaction-cost theory explains the modern corporate enterprise as a response to "market imperfections." The basic market imperfection is "asset specificity"—a technological condition that is given to the firm—while the market imperfections that make this condition economically problematic are opportunism, which is inherent in "human nature as we know it," and bounded rationality, which results from the limited capacity of individuals to absorb information.28 From the Williamsonian perspective, markets create "high-powered" incentives for participants in the economy because the returns that participants can reap from the application of their efforts are not constrained by the need to share them with any other participants on a continuing basis. The modern business corporation, in contrast, offers only "low-powered incentives," as exemplified by the payment of salaries that segment remuneration from productive effort.29 In the presence of asset specificity, and given the inherent limits on cognitive competence and the inherent human pursuit of self-interest with guile, in the Williamsonian firm "working things out" means opti-

27. Williamson, Economic Institutions of Capitalism, 128.
29. Williamson, Economic Institutions of Capitalism, 132, 144–45.
mizing subject to these technological, cognitive, and behavioral constraints.

In sharp contrast, for a theory of innovative enterprise, "working things out" concerns how, through an investment strategy and an organizational structure, the enterprise transforms industrial and organizational conditions so that the resulting asset specificity supports the generation of higher-quality, lower-cost products than had previously been available. From this perspective the modern corporation can be viewed as a manifestation of "organizational success" based on what I call "organizational integration" rather than as a response to "market imperfections."

The critical determinant of the success of an innovative strategy is "organizational integration"—a set of social relations that provides participants in a complex division of labor with the incentives to cooperate in contributing their skills and efforts toward the achievement of common goals. Organizational integration can be strategic, functional, and hierarchical, and indeed the three types of organizational integration interact dynamically in the innovation process. As such, organizational integration provides an essential social condition for an enterprise to engage in and make use of organizational learning—that is, learning that is collective and cumulative. Organizational learning is collective because it depends on the integration of an array of people with specific productive capabilities based on intimate knowledge of particular organizational and industrial conditions. Organizational learning is cumulative because the extent of the collective learning necessary for innovation requires learning to be stored and built upon within an integrated organization.

From the perspective of the innovative enterprise, and as illustrated in Figure 1, the essence of organizational integration is that,

by making possible organizational learning, it transforms “bounded rationality” and “opportunism” so that the cognitive and behavioral characteristics of participants in the enterprise contribute to the innovation process. Organizational integration can transform “individual rationality” into “collective rationality” and thus unbounds the cognitive abilities available to the enterprise. Organizational integration can transform opportunism—and indeed transform “human nature as [Oliver Williamson] know[s] it”—by both generating and sharing the gains of the innovation process in ways that create “high-powered” incentives—employment security, career opportunities, collective purpose—for the people on whom the enterprise relies to develop and utilize productive resources.

As a result, from the perspective of the innovative enterprise, it is organizations, not markets, that provide economic actors with “high-powered incentives.” The essence of the modern corporation as an innovative enterprise is that through its investment strategy it relies on asset specificity as a developmental source of competitive advantage and that through its organizational structure it unbounds ration-

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33. The seminal work on the role of the executive in integrating the individual into the organization is Chester Barnard, The Function of the Executive (Cambridge, Mass., 1938), whose classic study basically focused on how organizations can transform opportunism into cooperation.
ality and reduces opportunism—or even transforms opportunists into cooperative members of a learning organization. To analyze the modern corporation as a manifestation of organizational success rather than as a response to market imperfections requires a methodology that integrates theory and history, because it is the innovative enterprise's transformative process that the theory must explicate. Moreover, it is only when one has developed a viable explanation of the social foundations for organizational success in the modern corporation that one can begin to analyze how, within an existing business organization, success turns to failure. Organizational integration dissolves into organizational segmentation as participants in the enterprise, particularly, one might argue, those at the top, become prisoners of bounded rationality, act opportunistically, and seek to use accumulated assets as if they were general sources of revenues rather than the historical accumulations of organizational learning that provide the indispensable foundations for sustained competitive advantage.

The Modern Corporation as Innovative Enterprise

Chandler and Penrose as Intellectual Foundations

If one is looking for intellectual foundations on which to base a historically relevant theory of the modern corporate enterprise, the work of two scholars—one a historian and the other an economist—stand out. As applied specifically to the modern industrial corporation, the works of Alfred D. Chandler, Jr., on the strategy and structure of business enterprise and of Edith Penrose on the theory of the growth of the firm represent pioneering efforts to understand the business enterprise as a process of historical transformation. Both gained their central insights from studying the historical experience of the U.S. industrial corporation as it evolved in the first half of the twentieth century, when the developmental success of the American corporate enterprise had enabled the United States to dominate the global economy. Both emphasized the role of managerial organization as the foundation for corporate success. A critical evaluation of the contributions of Chandler and Penrose can enable us to build on their work to integrate the theory and history of the modern industrial corporation as innovative enterprise.34

34. It is worth noting that Penrose researched and wrote The Theory of the Growth of the Firm (Oxford, U.K., 1959) in the 1950s while a researcher and lecturer in the Department of Political Economy of Johns Hopkins University, the
Chandler and Economies of Scale and Scope

From the perspective of the history of innovative enterprise, *The Visible Hand* is Chandler's most successful work, largely because he brings a broad and deep familiarity with the social context of American economic development to his relentless focus on the evolution of management structure in the largest U.S. enterprises in the late nineteenth and early twentieth centuries.  

Chandler's work has demonstrated the centrality of the "managerial revolution" to the evolu-

same university where Chandler was a professor in the Department of History from 1963 to 1971. Nevertheless, they had little intellectual influence on each other. In the Introduction to *The Visible Hand*, Chandler includes Penrose in a list of economists who "have studied the operations and actions of modern business enterprise," and in the conclusion cites *The Theory of the Growth of the Firm* as showing how the inability "for all units in [a large integrated industrial enterprise] to be operating at the same speed and capacity [created] constant pressure for the growth of the firm." Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977), 5, 489. See also Alfred D. Chandler, Jr., "Scale, Scope, and Organizational Capabilities," in Thomas K. McCraw, *The Essential Alfred Chandler: Essays toward a Historical Theory of Big Business* (Boston, Mass., 1991), 498n, and the reference to Penrose's case study of Hercules Powder Company in Chandler, *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass., 1990), 758n67. In the Foreword to the third edition of *The Theory of the Growth of the Firm* (New York, 1995), ix, Penrose writes, "Chandler's book [Strategy and Structure] was finished before *The Theory of the Growth of the Firm* appeared, but the analytical structure within which its historical analysis was cast was remarkably congruent with my own work, using much the same concepts and very nearly the same terminology at many points." Penrose notes that she "did not have access [to Chandler's research] in writing my own work," but credits "the superb historical discussion of the growth of major American firms by Chandler" as confirming her own analysis of "the process of diversification combined with the analysis cf the costs of growth on the supply side," and of making possible "the most important extensions and modifications made by others over the past few decades." Penrose, *Theory of the Growth of the Firm*, xiii. See also, Edith Penrose, "The Theory of the Growth of the Firm Twenty-Five Years After," *Acta Universitatis Upsaliensis: Studia Oeconomiae Negotiorum* 20 (Uppsala University, 1985). For an early recognition of the importance of the Penrosian theory to business history, see Louis Galambos, "Business History and the Theory of the Growth of the Firm," *Explorations in Entrepreneurial History*, 2d ser., 4 (Fall 1966): 3–14.

tion of American industrial enterprise in the twentieth century. The main weakness of his historical analysis, even for the U.S. case, is his reluctance to consider the modern business enterprise itself as a social organization. For example, in *The Visible Hand*, he states as follows: “Modern business enterprise is easily defined. . . . [I]t has two specific characteristics: it contains many distinct operating units and it is managed by a hierarchy of salaried managers.”

The only issue that Chandler raises about the social organization of the enterprise is the professionalization of management—a subject that he does not, however, analyze.

On the theoretical plane, in *The Visible Hand*, Chandler emphasized “economies of speed” in the utilization of productive resources, but he did not extend his analysis to the shop floor. In my own work, Chandler’s focus on “economies of speed” has permitted me to link my research on the development and utilization of productive resources on the shop floor with his research on managerial organization. Yet, given that in the twentieth century most U.S. industrial corporations have pursued strategies of utilizing rather than developing human resources on the shop floor, it is ironic that my greatest problem with Chandler’s approach is his neglect of the development of productive resources as a source of competitive advantage. Indeed, in *Scale and Scope*, published in 1990, Chandler replaced the process-oriented concept of “economies of speed” with the positions-oriented concepts of “economies of scale and scope,” thus reinforcing his emphasis on the utilization of productive resources as the distinctive contribution of the modern corporation to economic growth.

To be sure, in all his work, Chandler presents historical material that provides considerable information relevant to the development, as distinct from the utilization, of productive resources in the modern industrial corporation. The problems arise in his attempt to transform the historical research into theoretical explanation. The shortcomings of Chandler’s theorizing on the basis of his historical work are evident in his article, “Organizational Capabilities and the Economic History of the Industrial Enterprise,” published in the *Journal of Economic Perspectives* in 1992 and directed at the economics profession.


37. Ibid., 8–9. As Chandler states, “I have not tried to describe the work done by the labor force in these units or the organization and aspirations of the workers. Nor do I attempt to assess the impact of modern business enterprise on existing political and social arrangements.” Ibid., 6.

Chandler does not articulate a theory of innovative strategy, another irony in view of the centrality of the "strategy-structure" framework to his earlier historical research. Rather, in his view, the capital-intensity of industries constrains enterprise strategy, as though even within a particular industry "capital-intensity" were not to some extent a result of the investment strategies and organizational structures of particular enterprises. He summarizes the era of industrial and enterprise transformation in the late nineteenth and early twentieth centuries: "Firms in these transformed or new industries differed from older ones. . . . The new firms were far more capital-intensive and able to exploit the potential economies of scale and scope made possible by the new technologies of production far more effectively."30

But how were these new technologies that created the potential for economies of scale and scope developed and utilized? In terms of the development of new technologies—that is, productive capabilities—answers to this question require an understanding of the organizational integration of people with different hierarchical responsibilities and functional specialties into learning processes that can generate higher-quality products and processes. But this process of developing productive capabilities tends to burden the enterprise with high fixed costs because of both the size and the duration of the development process. If the enterprise does not spread the high fixed costs of developing productive capabilities over large quantities of sold output, then a firm that pursues an innovative strategy will be at a competitive disadvantage, not a competitive advantage.40 "Economies of scale and scope" derive from the more complete utilization of the productive capabilities that the enterprise has developed. The high fixed costs of developing these capabilities means that the achievement of scale and scope are not only a potential source of competitive advantage but also a necessity for an innovative enterprise to transform a possible competitive disadvantage into an actual competitive advantage. Moreover, in diversifying its products, the innovative enterprise must invest in the development of new productive capabilities in order to make use of existing productive capabilities, so that the quest for economies of scale constantly re-creates the necessity to achieve economies of scale in the new industrial activities.41


40. See the earlier discussion of the innovative enterprise and the theoretical analysis in Lazonick, Business Organization, chap. 3.

Economies of scale and scope are therefore outcomes of the innovation process that need to be explained. As Chandler recognizes, it is the organization of the enterprise that permits it to achieve economies of scale and scope. But what does enterprise organization do? In his efforts to transform his comparative history into a theory of the dynamics of industrial enterprise, Chandler invokes the concepts of "organizational capabilities" and "organizational learning," which he locates within the managerial structure. But what do such capabilities and learning accomplish? For Chandler, managerial learning is related to the utilization of productive capabilities, not the development of productive capabilities, as he states in his "Organizational Capabilities" article:

For most [industrial enterprises], the long-term continuing strategy of growth was expansion into new geographical or product markets. The move into geographically distant areas was normally based on the competitive advantages provided by organizational capabilities learned through exploiting economies of scale. Moves into related product markets rested more on capabilities developed from exploiting of the economies of scope.42

Chandler goes on to give a detailed summary of the sources of organizational learning that implicitly involve the development of new technologies, and he recognizes that "such learned skills and knowledge were company-specific and industry-specific."43 Nevertheless, he continually emphasizes that it is the utilization of resources—the achievement of economies of scale and scope, given the investments that the enterprise has made—that creates both the need for organizational learning and the context for the acquisition of skills that permit the realization of economies of scale and scope.

On the surface, Chandler closes this gap in his theoretical analysis by endowing the otherwise analytically empty concept of "first-mover advantage" (borrowed from conventional industrial-organization economics) with the substance of investment in productive resources, both physical and human: "The first firms to make the three-pronged investments in manufacturing, marketing, and management essential to exploit fully the economies of scale and scope quickly dominated their industries. Most continued to do so for decades."44 But the notion of a "three-pronged investment" raises more

43. Ibid., 83–84.
44. Ibid., 81.
theoretical questions than it answers. What were the capabilities that were developed by these “three-pronged investments”? How were these capabilities integrated strategically, functionally, and hierarchically so that those people involved in the innovative enterprise had the incentives to cooperate in the development and utilization of productive resources?

Chandler is aware of the need to answer such questions. At the conclusion of his *Journal of Economic Perspectives* article, he poses a number of “significant questions for study” that derive from an “evolutionary theory” of the firm:

How precisely were the learning processes carried out? How and why did industry-specific and particularly company-specific characteristics vary? Why were some capabilities more easily transferred to different geographic and new product markets than others? What were the contents of the routines developed to evaluate and capture new markets and move out of old ones? Why has functional and strategic competition in modern capitalistic economies played a larger role in changing market share and profit than price? What are the determinants of competitive success in national industries and national economies?45

Chandler then goes on to argue: “In pursuing these questions, I am convinced that the unit of analysis must be the firm... Only by focusing on the firm can theory predict the firm’s continuing role as an instrument of economic growth and transformation, and assist in developing policies and procedures for maintaining industrial productivity and competitiveness in an increasingly global economy.”46

The Penrosian Theory of the Growth of the Firm

In *The Theory of the Growth of the Firm*, Edith Penrose argued that the modern corporate enterprise has to be viewed as an organization that administers a collection of human and physical resources. Human resources are by far the most critical, because they render services that can enable the firm to make unique contributions as a generator of higher-quality, lower-cost products. People contribute these unique labor services to the firm, not merely as individuals, but as members of teams who engage in learning about how to make best use of the firm’s productive resources—including their own. At any point in time, this learning endows the firm with experience that

45. Ibid., 99.
46. Ibid.
gives it productive opportunities that are unavailable to other firms, even in the same industry, that have not accumulated the same experience.

The Penrosian firm is an innovative enterprise. As Michael Best has put it, "Penrose's theory of the growth of the firm is based upon two assumptions: everything cannot happen at once, and a person cannot do everything alone." For Penrose the accumulation of developmental experience enables the firm to overcome the "managerial limit" that in the theory of the optimizing firm causes the onset of increasing costs and constrains the growth of the firm. This developmental experience enables the firm to transfer its existing productive resources to new productive opportunities and even to shape the market for its products to generate new market opportunities.

Each move into a new product market enables the firm to utilize unused productive services but also requires investments in the creation of new productive services that are the basis for the continuing growth of the firm. These unused productive services can enable a firm to grow not only through diversification of its products but also through the acquisition and absorption of other firms that have developed complementary productive services. Key to the determination of which productive opportunities the firm pursues and, in the case of merger and acquisitions, which firm absorbs which, is the possession of what Penrose calls "entrepreneurial services" by the growing firm.

But, in a growing enterprise, entrepreneurial services will not yield success if the productive resources under the firm's control are not administered in an integrated way. Hence "managerial services" that engage in "administrative integration" are of critical importance to the growth of the firm. Through this process of the growth of the firm, innovative capability becomes embedded in its very operations. To grow over time the enterprise must utilize its unique pool

48. Penrose, Theory of the Growth of the Firm, chaps. 5-7. In the Foreword to the 1995 edition of The Theory of the Growth of the Firm (p. xii), Penrose states that "the growing experience of management, its knowledge of the other resources of the firm and the potential for using them in different ways, create incentives for further expansion as the firm searches for ways of using the services of its own resources more profitably. The firm's existing human resources provide both an inducement to expand and a limit to the rate of expansion. Even growth by acquisition and merger does not escape the constraints imposed by the necessity of using inputs from existing managerial resources to maintain the coherence of the organization."
49. Ibid., 182-89.
50. Ibid., 189-94, 112-16. In this view of the routinization of industrial research, Penrose's views are close to those of Schumpeter in his later work, which
of resources to generate new products, developed in the past, while building on the existing pool of resources to generate new unique capabilities.

"The proposition," says Penrose, "that enterprising firms have a continuous incentive to expand and that there is no limit to their absolute size (other than that imposed by our conception of the nature of an industrial firm) stands in sharp contrast to the notion of an 'optimum' size of firm."\(^5\) How then can one characterize the economies that result when the "enterprising firm" is able to utilize the productive resources that it has developed? Penrose makes a distinction between "economies of size" and "economies of growth," arguing that "growth is a process; size is a state." "Economies of size," she argues,

are present when a larger firm, because of its size alone, can not only produce and sell goods and services more efficiently than smaller firms but also can introduce larger quantities of new products more efficiently. In discussion of the economies of size, so-called "technological economies," derived from producing large amounts of given products in large plants, are commonly distinguished from "managerial" and "financial" economies, derived from improved managerial division of labor and from reductions in unit costs made possible when purchases, sales, and financial transactions can be made on a large scale.\(^5\)

After a discussion of these different types of "economies of size" and their interaction, Penrose makes it clear that once one recognizes that firms can differ in their managerial capabilities it is futile to attempt to specify the "optimum" size of the firm without reference to these particular capabilities. "Only for firms incapable of adapting their managerial structure to the requirements of larger operations," she argues, "can one postulate an optimum size."\(^5\) In other words, a unique "optimum" applies only to those firms that, because of inferior managerial capabilities, must take as constraints the technological and market conditions that other enterprises, with superior managerial capabilities, are able to transform.

For such an enterprise with superior managerial capabilities, and hence the potential to continue to grow, "the economies of growth" she cites on this point. As "a perceptive discussion of research and innovation as an 'ordinary' business activity," Penrose also cites the well-known article, influencen by Schumpeter's work, by Carolyn S. Solo, "Innovation in the Capitalist Process," Quarterly Journal of Economics 65 (Aug. 1951): 417–28.

52. Ibid., 89.
53. Ibid., 98.
that it can reap depend on a unique process that evolves over time. Hence the outcome of this process—an eventual “optimal” state that derives from the process of growth—cannot be known before the productive resources that can generate this growth have been developed and utilized. As Penrose puts it,

Economies of growth are internal economies available to an individual firm which make expansion profitable in particular directions. They are derived from the unique collection of productive services available to it, and create for that firm a differential advantage over other firms in putting on the market new products or increased quantities of old products. At any time, the availability of such economies is the result of the process [discussed earlier in the book] by which unused productive services are continually created within the firm.54

Penrose adds that economies of growth “may or may not be also economies of size,” because “under given circumstances, a particular firm may be able to put additional output on the market at a lower average cost than any other firm, whether larger or smaller.” “For one of the significant characteristics of the economies of growth,” she goes on to explain, “is that they depend on a particular collection of productive resources possessed by the particular firm, and the exploitation of the opportunities provided by these resources may be quite unrelated to the size of the firm.”55

The main methodological strength of Penrose’s work is her explicit recognition of the theoretical difference between the innovative enterprise and the optimizing firm. The basis for this distinction is her understanding that a firm is a unique social entity that can engage in learning that is both collective and cumulative.56 She also emphasized the dynamic relation between the development of productive resources and their utilization, and hence between the achievement of high quality and low cost. She understood, therefore, that innovative strategies could place the enterprise at a competitive disadvantage if the productive resources that the enterprise develops are not sufficiently utilized.

The main theoretical strength of Penrose’s work is that she placed organizational learning at the center of the analysis. She equated the “firm” with its managerial organization, and organizational learning with managerial learning.57 Penrose’s perspective on the enterprise

54. Ibid., 99.
55. Ibid., 99, 100.
56. See O’Sullivan, Contests for Corporate Control, 15–17, 63–65.
57. Penrose explains in the Foreword to the 1995 edition of her book: “I elected to deal with what was called the ‘managerial firm’—a firm run by a man-
as managerial organization represents an important advance on economic theories of the firm in which social organization plays no role. Typically, in such theories the "firm" is assumed to be either a solitary actor—the individual "entrepreneur"—or a unified entity, with no attention paid to the motivations of the various participants in the enterprise and the types of incentives to which they respond. Moreover, Penrose's emphasis on managerial organization as defining the boundaries of organizational learning in the modern corporation reflected a reality of the U.S. industrial enterprises that she studied in the mid-twentieth century.

In comparative and historical perspective, however, the main weakness of the Penrosian "theory of the growth of the firm" for building a theory of innovative enterprise is its implicit assumption that, in all times and places, organizational learning is inherently managerial learning. Such a perspective has difficulty explaining, for example, why most Japanese and many European enterprises in the post—World War II decades extended organizational learning to shop-floor workers and independent suppliers, and how this development and utilization of deeper skill bases affected international competitive advantage and national economic performance.\(^{58}\) Even at the managerial level, Penrose's theory of the growth of the firm lacks a theory of the organizational—strategic, functional, and hierarchical—integration of administrative, technical, and professional personnel into the managerial structure of the modern corporation.

Writing in the late 1950s, Penrose assumed that the modern industrial corporation would always try to utilize the unused productive resources at its disposal. She understood that to make use of these available productive resources to enter new markets means investing in new, complementary, productive resources, including reinvestment in the productive capabilities of current personnel. Penrose equates the profit motive and the growth motive in determining the investment strategy of the firm.\(^{59}\) This equation holds, however, only if those who control the allocation of corporate resources cannot or will not seek higher returns for the "firm"—now defined as those who remain in the enterprise's employment, including them—

\(^{58}\) See Lazonick and O'Sullivan, "Organization, Finance and International Competition"; Lazonick and O'Sullivan, "Big Business and Skill Formation in the Wealthiest Nations."

selves—by shedding “unused productive resources”—that is, those “human assets” whose services are deemed to be no longer of value by those who exercise strategic control.60

As the experience of many U.S. corporations over the past few decades has shown, internal growth may reach a point where diseconomies of growth outweigh economies, because of either a separation of strategic decision making from organizational learning or the emergence of new competitors with superior organizational capabilities.61 In the Foreword to the 1995 edition of The Theory of the Growth of the Firm, Penrose recognizes that, writing in the late 1950s, one had yet to witness the advent in the United States of the conglomerate movement of the 1960s, the subsequent divestments of conglomerate divisions of the 1970s, the rise of the market for corporate control under the slogan of “creating shareholder value” in the 1980s, and the consolidation of the practice of running companies to “maximize shareholder value” in the 1990s.62 In the widespread corporate downsizings of the 1980s and 1990s, the services of once valued “human assets”—both managers and workers—were thrown on the market rather than being mobilized for the further growth of the firm.

From Resource-Based Theory to Dynamic Capabilities

Penrose’s theory of the growth of the firm provides a highly perceptive explanation of the growth and persistence of the industrial corporation from the late nineteenth century through the 1950s, with particular reference to the U.S. experience.63 Penrose insisted that


61. O’Sullivan, Contests for Corporate Control, chap. 5.


63. See the discussion in Yasemin Y. Kor and Joseph T. Mahoney, “Penrose’s Resource-Based Approach: The Process and Product of Research Creativity,” Journal of Management Studies 37 (Jan. 2000): 109–39. Penrose herself stated that her theory of the growth of the firm “is concerned only with the incorporated industrial firm operated for private profit and unregulated by the state... and is applicable only to an economy where the corporation is the dominant form of industrial organization; historically, therefore, only to the period since the last quarter of the 19th century. To be sure, the corporation was widely used in certain areas much earlier, but it did not dominate the field of manufacturing as it has since,
the business enterprise had to be analyzed as a social organization and that "growth is essentially an evolutionary process [that is] based on the cumulative growth of collective knowledge in the context of a purposive firm."  

During the 1960s Penrose's *The Theory of the Growth of the Firm* was cited by economists such as William Baumol, Robin Marris, and Oliver Williamson in the debates on the relationship between the profitability of the firm and its growth, but it was otherwise generally ignored by economists—possibly because, as a theory of innovative enterprise, the historical transformation of industrial conditions that her theory implied could not be reconciled with constrained-optimization methodology. How else could one explain the fact that in his 1966 American Economic Association Presidential Address entitled, "Theories of the Firm: Marginalist, Behavioral, and Managerial," Fritz Machlup, Penrose's dissertation advisor and mentor at Johns Hopkins when she was researching and writing *The Theory of the Growth of the Firm*, made no reference to her work? The published version of Machlup's address took up thirty-one pages of text, and contained a total of forty-eight bibliographic references, but no mention of Penrose is to be found. Given the way in which Machlup summed up his survey of "theories of the firm," it is not surprising that he lacked an appreciation for Penrose's contribution:


65. William Baumol, "On the Theory of Expansion of the Firm," *American Economic Review* 52 (Dec. 1962): 1078–87; Robin Marris, *The Economic Theory of "Managerial" Capitalism* (New York, 1964); Oliver Williamson, "Hierarchical Control and Optimum Firm Size," *Journal of Political Economy* 75 (April 1967): 123–38. The articles by Baumol and Williamson, and excerpts from Marris's book, were included in *The Theory of the Firm: Selected Readings*, ed. G. C. Archibald (Harmondsworth, U.K., 1971). In his article, Williamson argued that the growth of the firm was accompanied by increases in the span of hierarchical control that resulted in control loss and hence increasing costs, thus placing a limit on firm growth and making it possible to determine the optimal size of the firm. Williamson referred to Penrose's proposition that the rate of growth of the firm is limited by the internal experience of management; in an appendix to his article, he interpreted the Penrosian arguments to imply that the span of control was inversely related to the rate of growth. In his later work, Williamson made only passing references to Penrose—see, for example, Williamson, *Economic Institutions of Capitalism*, 135; Williamson, *The Mechanisms of Governance*, 225, 309.

Now what conclusions from all our reviewing may we draw on the conflicts between marginal analysis, behavioral theory and managerial theory of the firm? ... As far as the proponents of managerial theories are concerned, they have never claimed to be anything but marginalists, and the behavior goals they have selected as worthy for incorporation into behavior equations, along with the goal of making profits, were given a differentiable form so that they could become part of marginal analysis. Thus, instead of a heated contest between marginalism and managerialism in the theory of the firm, a marriage between the two has come about.  

In the early 1980s, however, many economists who were developing resource-based and evolutionary theories of the firm began to cite Penrose’s book as they sought to understand the existence and persistence of the corporate enterprise in advanced economies. The resource-based perspective took as its theoretical starting point a market economy in which the market allocation of resources should result in all firms in an industry optimizing subject to the same cost structures and hence experiencing the same performance outcomes. Yet, for anyone concerned with “competitive strategy” and “competitive advantage,” what had to be explained were the facts that, in the real world, firms that competed in the same industry had control over different resource bases and experienced different performance outcomes, whether measured in terms of growth or profitability. While the transaction-cost perspective of Coase and Williamson asked why firms exist in a world of market transactions, the resource-based perspective asked why firms differ in a world of markets. Scholars of strategic management needed to explain how, in a market economy, different firms acquired unique resource bases, how they maintained control over those resource bases over time, and how those unique resource bases might contribute to superior economic performance—that is, sustained competitive advantage.

Early proponents of the resource-based theory, such as Birger Wernerfelt, Richard Rumelt, and Jay Barney, sought to answer these questions within the neoclassical paradigm of an economy in which markets, rather than organizations, allocate resources. Lacking a de-

velopmental theory of the economy in which the strategic allocation of resources and returns by business enterprises provided the motive force, resource-based theorists simply delineated the “firm-specific” characteristics of the unique and presumably valuable resource bases held by firms that would keep other firms from imitating those resource positions or competing them away by means of market resource reallocations. In effect, resource-based theorists asked how, in a market economy, firm-specific resource bases could function as barriers to entry to other firms that had not had the luck or foresight to establish comparable resource-base positions.

In taking this approach, resource-based theory followed Michael Porter, who in his 1980 book *Competitive Strategy* had turned mainstream industrial organization, based on the neoclassical monopoly model, on its head. Working in economics departments, industrial-organization economists such as Joe Bain and Richard Caves had asked how monopolistic barriers to entry could be brought down to improve the allocation of resources in the economy as a whole. In contrast, working within a business school, Porter had constructed his “five forces” analysis to ask how a company could secure competitive advantage by erecting barriers to entry against existing rivals, deterring new entrants from competing in the industry, avoiding competition with substitutes, and increasing its bargaining power vis-à-vis buyers and suppliers.

By asking how a firm's resources enhanced its ability to exert market power, Birger Wernerfelt saw a resource-based theory of the firm as an extension of Porter's analysis. Through “first-mover advantages” in acquiring “attractive resources,” a firm could create “resource-position barriers” to entry. Influenced by the work of game theorists such as Michael Spence, Wernerfelt supposed that attractive resources acquired by first movers could be machine capacity, which deters entry by others through fear of creating excess capacity in an industry; production experience, which gives first movers “experience curve” advantages; customer loyalty, which is difficult to replicate; and technological leads, which, by yielding higher returns, attract better personnel to the first mover. As Wernerfelt stressed, “What a firm wants is to create a situation where its own resource


position directly or indirectly makes it more difficult for others to catch up."  
Wernerfelt did not have anything to say about why or how a firm could be a first mover, and he also recognized the possibility of what Richard Foster was later to call "the attacker's advantage."

So too, neither Rumelt nor Barney provided an analysis of why one firm might be a first mover or why a first-mover advantage necessarily became translated into a competitive advantage. Rumelt defined "strategy" as "the concept . . . that a firm's competitive position is defined by a bundle of unique resources and relationships and that the task of general management is to adjust and renew these resources and relationships as time, competition, and change erode their value." He emphasized that "a firm's strategy may be explained in terms of unexpected events that created (or will create) potential rents together with the isolating mechanisms that (will) act to preserve them . . . . Firms that are lucky or insightful enough to make early commitments to what turn out to be defensible positions can be stunningly successful." In a later contribution, Barney posited, "To be a first mover by implementing a strategy before any competing firms, a particular firm must have insights about the opportunities associated with implementing a strategy that are not possessed by other firms in the industry, or by potentially entering firms."

But how do "insights" (or luck) get translated into a "resource-based" competitive advantage? The resource-based argument can easily reduce to the tautology that if a firm somehow comes to possess resources that are both valuable (yield sustained competitive advantage) and difficult for other firms to acquire through the market or to replicate, then one can account for differences in the performance among firms in terms of the resources that they possess. Such an argument describes an advantageous position that a particular firm has attained at a point in time, but it does not provide a theory of the organizational process that enabled that particular firm to attain

73. Rumelt, "Towards a Strategic Theory of the Firm"; Barney, "Strategic Factor Markets."
75. Ibid., 568 (emphasis in original).
that position, in competition with other firms in its industry. As such, resource-based theory lacks a theory of innovative enterprise. Yet the resource-based argument that, within an industry, some firms could sustain an advantageous position over others signaled the need for a historical-transformation methodology that could analyze the organizational process that made such an outcome possible.

Within the resource-based perspective, Ingemar Dierickx and Karel Cool helped to move the positions perspective a step toward a process perspective in a short article that was a critique of Barney’s notion of “strategic factor markets.” Dierickx and Cool recognized that (a) “strategic assets” have to be nontradeable if the firm is to capture the competitive advantages attributable to these assets, and (b) the way in which a firm can achieve such a result is through the accumulation of a “firm-specific” stock of capabilities inherent in such assets over an extended period. Asking the question, “Can a scholar buy his or her reputation for quality work in a strategic factor market?” Dierickx and Cool drew “the managerial implication . . . that firms should focus their analysis mainly on their ‘unique’ skills and resources rather than on their competitive environment.”

Dierickx and Cool couched their arguments in terms of imperfections in factor markets rather than, as I would put it, the dynamics of organizational success. Hence for them the line of causation is from an imperfection in the factor market to an internal process of what they call “the accumulation of asset stocks”—that is, from a market position to an organizational process. “Being nontradeable,” they argue, “the firm-specific component [of the asset stock] is accumulated internally.” Yet, from their discussion of the asset-stock accumulation process, they conclude, “The common element in all these cases is that the strategic asset is the cumulative result of adhering to a set of consistent policies over a period of time.” One might conclude, therefore, that the line of causation runs the other


80. Ibid., 1506.
way: from an organizational process that allocates resources and returns for the sake of accumulating "firm-specific" assets to the creation of a market position that is superior to that attained by those enterprises that have not undertaken such an organizational process. If such is the case, the focus of the study of strategic management should be on the organizational processes whereby corporations allocate resources and returns rather than on how firms exploit market imperfections to create unique resource positions in an economy characterized by a reliance on the market mechanism to allocate resources and returns.\textsuperscript{81}

Reflecting the underlying adherence of the resource-based perspective to the theory of the market economy—that is, to a theory in which markets rather than organizations direct the allocation of resources—its proponents habitually refer to the returns on unique resources as rents.\textsuperscript{82} As used in economics, rent is a return to a factor of production the supply of which is fixed—for example, land in a particular location. Its supply cannot be increased through the process of production. Yet the innovation process contributes to economic development by transforming the production process to overcome conditions of scarcity imposed by the resource base. A surplus generated by the innovation process is the result of the ability of the enterprise to produce a larger quantity or higher quality of output with a given quantity and quality of inputs. This surplus is not a "rent," and it is a fundamental error of economic analysis to call it such. It has long been recognized by students of economic development (including economic anthropologists) that the process of economic development generates economic surpluses, in which various groups of participants in the process can potentially share. These surpluses, not rents, are the basis for the achievement of higher standards of living. The use of the term "rents" in resource-based theory, as in other economic theories that rely on the theory of the market economy, reflects the perspective's lack of a theory of innovation and economic development. One cannot use such a "rent-generating" perspective to analyze the relation between the allocation of corporate returns and the process of innovation.

Moreover, if one insists upon using the concept of rents as the explanation for "residual" returns to unique resource bases, one has to account for a lack of quasi-rents (a concept dating to the late nine-


\textsuperscript{82} Lazonick, \textit{Business Organization}.
teenth century, much used in Marshallian economics) that, in a market economy, would erode the competitive advantage of the firm that employed unique resource bases. The existence of quasi-rents means that market competition for the unique resources enables the scarcity value of these resources to be appropriated by the owners of the resources who can trade them on the market, not by the firm that employs them. Hence Dierickx and Cool's insight that, within the framework of resource-based theory, one has to assume that a unique resource is "nontradeable" for it to be a source of competitive advantage. But then the critical question for understanding the allocation of corporate returns among participants in the enterprise is whether a condition of "nontradeability" represents simply a barrier to exit for a particular factor of production—in which case it is difficult to see why the unique resource generates any residual (that is, surplus revenues), whatever one labels it—or whether it represents (as I have claimed Dierickx and Cool implicitly argue) the outcome of an organizational process that integrates the resource into the cumulative and collective structure of an innovative enterprise. In this case, the surpluses that accrue to the enterprise after all factors of production are paid their market rates of return derive from the enterprise's development of the unique resources that can generate higher-quality, lower-cost products—and in doing so has made these resources less scarce than they had previously been.

The failure of resource-based theorists to recognize that a theory of sustained competitive advantage must be rooted in a theory of "organizational success" is indicated by Birger Wernerfelt's comments, published in 1997, on the limited progress of the resource-based perspective. Wernerfelt stated that in his original 1984 contribution to the resource-based perspective he had "assumed that resources were leveraged inside the firm and took as given that firms had heterogeneous resource endowments." 83 Wernerfelt recognized that in the ensuing years, the resource-based perspective had been enhanced by work on such phenomena as "competencies," "the evolutionary perspective," "commitments," and "dynamic capabilities." 84 Nevertheless, he observed, "many resources remain mystical":

We have made progress in discussing them in terms of their effects, but we do not really know what they are. I feel that we need

84. Ibid.
to move towards a more specific understanding of the nature of different resources, rather than of their effects. We have some understanding of reputational resources, including brand names, as well as irreversible investments in physical assets. However, many resources are only known indirectly. A good example of this is “group resources.” What is it exactly that makes one group of people better at doing something than another? I suspect that this class of resources contains most of the critical ones. However, at the moment its contents are in a black box, and unless we open it, we will not be able to say much about it.  

Yet, as we have seen, almost forty years earlier Edith Penrose had published *The Theory of the Growth of the Firm*, a book that surely looked “inside the black box” at the operation of “group resources.” Indeed, in his 1984 article, Wernerfelt stated that “[t]he idea of looking at firms as a broader set of resources goes back to the seminal work of Penrose (1959).”

So fond have resource-based theorists been of claiming Penrose’s book as part (or the entirety) of their intellectual tradition that in a comparison of “process-oriented” evolutionary theory with “equilibrium-oriented” resource-based theory, Nicolai Foss, Christian Knudsen, and Cynthia Montgomery included Penrose (along with the “strategic management tradition” and “Chicago industrial economics”) within the “intellectual heritage” of resource-based theory, as exemplified by what I have called the “position perspective” contributions of Wernerfelt, Barney, Rumelt, and Dierickx and Cool. But Penrose’s contribution to the theory of the firm as a social organization confronts the market-oriented ideology and equilibrium-oriented methodology of resource-based theory. The problem for Foss, Knudsen, and Montgomery may be that they could not possibly have included Penrose as an intellectual predecessor of evolutionary theory, given that they include (along with Joseph Schumpeter) Armen Alchian within that tradition. In 1952, as a prelude to work that resulted in *The Theory of the Growth of the Firm*, Penrose published a devastating critique of Alchian for his use of the biological analogy in economics to analyze phenomena such as the nature of the firm that clearly had to be analyzed as social processes. Referring to this 1952 article, Penrose wrote at the beginning of *The Theory of the Growth of the Firm*:

85. Ibid., xvii–xviii.
86. Wernerfelt “Resource-Based View of the Firm.” 171.
In addition to the traditional approaches [to the theory of the growth of the firm], there have been sporadic attempts to develop theories of the growth of firms using biological analogies and treating firms as organisms whose processes of growth are essentially the same as those of the living organisms of the natural world. There are many difficulties with this type of analysis, one of the most serious being the fact that human motivation and conscious human decision have no place in the process of growth. This alone, I believe, is sufficient grounds for rejecting such theories of the growth of firms. All the evidence we have indicates that the growth of the firm is connected with attempts of a particular group of beings to do something; nothing is gained and much is lost if this fact is not explicitly recognized.  

Nevertheless, three decades after Penrose’s critique, Richard Nelson and Sidney Winter combined a Schumpeterian perspective on innovation with the biological analogy to mount a major attack on the failure of neoclassical economics to analyze the existence and persistence of business enterprises as repositories of “organizational capabilities” in the economy. Especially in the hands of Nelson, the evolutionary approach has fostered a research agenda in which the biological analogy has faded into the background in favor of comparative-historical analyses of national determinants of innovation and industrial leadership. In “Why Do Firms Differ, and How Does It Matter?” Nelson articulates the need for a theory of organizational capabilities as a basis for a theory of innovative enterprise: “I want to put forth the argument that it is organizational differences, especially differences in abilities to generate and gain from innovation, rather than differences in command over particular technologies, that are the source of durable, not easily imitable, differences among firms. Particular technologies are much easier to understand, and imitate, than broader firm dynamic capabilities.” He goes on to say that “the

91. Richard R. Nelson, “Why Do Firms Differ, and How Does It Matter?” *Strategic Management Journal* 12 (Winter 1991): 61–74; reprinted in Nelson, *Sources of Economic Growth*, 118. In this essay Nelson states that the evolutionary theory of the firm that he had developed with Sidney Winter “drew significantly on Simon (1957), on Cyert and March (1963), and on Penrose (1959), as well as on Schumpeter.” Ibid, 110. Yet if one looks for the Penrosian influence in the Nelson and Winter treatise *An Evolutionary Theory of Economic Change* it is to argue that “Penrose (1959) provided the elements of an analysis linking firm growth,
‘dynamic capabilities’ view of firms being developed by scholars in the strategy field can be seen to be important not only as a guide to management, but also as the basis for a serious theory of the firm in economics.”92

The most developed statement of this perspective to date is that of David Teece, Gary Pisano, and Amy Shuen, in an article published in the Strategic Management Journal in 1997.93 They contrast the dynamic capabilities perspective with a perspective dominant in the management literature on “strategizing” that entails “engaging in business conduct that keeps competitors off balance, raises rival’s costs, and excludes new entrants” and that conceives of “rents” as “flow[ing] from privileged product market positions.”94 Teece, Pisano, and Shuen argue that

the [dynamic capabilities] framework suggests that private wealth creation in regimes of rapid technological change depends in large measure on honing internal technological, organizational, and managerial processes inside the firm. In short, identifying new opportunities and organizing efficiently and effectively to embrace them are generally more fundamental to private wealth creation than is strategizing [against existing and potential rivals].95

Teece, Pisano, and Shuen see the distinctiveness of firms as opposed to markets as residing in the capabilities in “organizing and getting things done” in ways that “cannot be accomplished merely by using the price system to coordinate activity.” They emphasize, “The very essence of capabilities/competences is that they cannot be readily assembled through markets.”96 Of the three elements of their

structure, and the nature of the management function [that] is largely consistent with [Coase’s transaction cost approach to the nature of the firm].” Ibid., 36. The only other reference to Penrose in the Nelson and Winter book is to object to her rejection of the biological analogy on the grounds that Winter “made the connection to the work of the behavioralists, proposing that the observed role of simple decision rules as immediate determinants of behavior, and operation of the satisficing principle in the search process for new rules, provided the required genetic mechanism.” Ibid., 42.

95. Ibid., 509–10.
96. Ibid., 517.
framework—positions, processes, and paths—it is organizational processes that define their approach: "We define dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage, given path dependencies and market positions." Or, as they state later in the paper, "The essence of a firm's competence and dynamic capabilities is presented here as being resident in the firm's organizational processes, that are in turn shaped by the firm's assets (positions) and its evolutionary path." "Organizational processes," they argue, "often display high levels of coherence, and when they do, replication may be difficult because it requires systemic changes throughout the organization and also among interorganizational linkages, which may be hard to effectuate." 97 Teece and his coauthors liken "coherence" to Nelson and Winter's notion of "routines," with the caveat that "the routines concept is a little too amorphous to properly capture the congruence among processes and between processes and incentives that we have in mind." They stress the importance of learning processes that are "intrinsically social and collective" and argue that the "concept of dynamic capabilities as a coordinative management process opens the door to the potential for interorganizational learning." 98

Organizational processes transform the capabilities of the firm over time, whereas asset positions determine the firm's "competitive advantage at any point in time." 99 Teece, Pisano, and Shuen describe asset positions under the separate headings of "technological," "complementary," "financial," "reputational," "structural," "institutional," "market structure," and "organizational"—that is, they include under the label "asset positions" virtually any descriptive dimension of the firm as an organizational entity at any given moment. 100 And, although organizational processes can transform these characteristics of the firm, and hence its competitive capabilities over time, the firm's evolutionary path—its particular history, or "path dependency"—constrains the types of industrial activities in which a firm can be competitive. The authors stress, however, that an enterprise nevertheless has the capacity to take advantage of technological opportunities created by "new scientific breakthroughs." The techno-

97. Ibid., 516, 524, 519.
99. Ibid., 521.
100. Ibid., 521–22.
logical opportunities created by these breakthroughs, moreover, “may not be completely exogenous to industry, not only because some firms have the capacity to engage in or at least support basic research, but also because technological opportunities are often fed by innovative activity itself.”

Nevertheless, they argue, the firm’s “evolutionary path, despite managerial hubris that might suggest otherwise, is often rather narrow.” Strategic change is generally incremental, as new capabilities have to build cumulatively on the capabilities previously put in place. From the dynamic capabilities perspective, “strategy involves choosing among and committing to long-term paths or trajectories of competence development.”

But by whom and for whom are such strategic choices made? Teece, Pisano, and Shuen say nothing specific about the locus of strategic control ensuring that the enterprise seeks to grow by using the collective processes and along the cumulative paths that are the foundations of its distinctive competitive success; that is, they have nothing to say about who within the organization’s hierarchical and functional division of labor should make strategic decisions to maintain the integration of strategy and learning and thereby sustain the innovation process. Nor do they have anything to say about how returns should be allocated to ensure the financial commitment and organizational integration required to sustain the innovative process. As a result, the dynamic capabilities approach has thus far provided no insights into the conditions under which strategic control might become segmented from the organizational learning processes that are central to the development of an enterprise’s core competencies, or how, under such circumstances, the structure of strategic control can be transformed to effect the reintegration of strategy and learning.

Nor has the dynamic capabilities approach provided guidance for understanding how an enterprise can and should respond strategically when it is confronted by new competitors whose dynamic capabilities render the enterprise’s processes and paths, and hence asset positions, obsolete. But the dynamic capabilities approach is an emergent perspective that, in its general orientation to the study of “innovative enterprise,” recognizes the need for a historical-transformation methodology. At the conclusion of their paper, Teece,

101. Ibid., 523–24.
102. Ibid., 524, 529.
Pisano, and Shuen call for further theoretical and empirical work for understanding

how firms get to be good, how they sometimes stay that way, why and how they improve, and why they sometimes decline. Researchers in the field of strategy need to join forces with researchers in the fields of innovation, manufacturing, and organizational behavior and business history if they are to unlock the riddles that lie behind corporate as well as national competitive advantage. There could hardly be a more ambitious research agenda in the social sciences today.\textsuperscript{104}

Integrating Theory and History in Economic Analysis

To implement such an “ambitious research agenda” requires a theory of economic development that can comprehend the social conditions of innovative enterprise. In turn, the elaboration of such a theory requires a research methodology that integrates theory and history.

“History” is not just a set of facts. Rather, it is a complex process of change from which, if we can learn both to understand it and abstract from it, can be drawn a theoretical perspective that can help us comprehend the problems of the present and the possibilities of the future. To make use of history to understand the process of economic development, it is not enough to say, as have proponents of “path dependency,” that “history matters.”\textsuperscript{105} Depending on the configuration of industrial, organizational, and institutional conditions, path dependency can either promote or constrain the innovation process, and for the analysis of economic development it is of central importance to identify what social conditions have which impact. For a particular business enterprise or national industry, a set of social conditions that yielded innovation and economic development in the past may now become obstacles to change.\textsuperscript{106} Under such conditions, however, decline is not inevitable if through the interaction of institutions and organizations new social conditions of innovative enterprise can be put in place. The development of an understanding of the relation of different social conditions to economic perfor-

\textsuperscript{104} Teece, Pisano, and Shuen, “Dynamic Capabilities and Strategic Management,” 530.


\textsuperscript{106} See, for example, Elbaum and Lazonick, Decline of the British Economy.
mance in different times and places and for different units of analysis requires comparative-historical research on the successes and failures of economic development.

A theoretical understanding of how to identify the problems and possibilities of such institutional, organizational, and industrial change requires that theory be used for the purposes of exploring a complex and changing reality, not for ignoring it. Theory captures the essence of what we know and provides a guide for what we need to know. The integration of theory and history provides intellectual discipline by forcing us to reconsider our theoretical models when the hypotheses that have been posed by them lack empirical support.

Economists have long argued that, since all theory is based on abstraction from reality, the particular assumptions one makes in building a model do not matter, so long as the model’s predictions stand up. Even if one accepts the dubious proposition that the economics profession judges the merits of the contributions of its members on the strength of their predictions, there are two basic problems with this methodological position. First, if one’s predictions do not prove correct, then a methodology is needed for exploring the underlying reality to see where the model went wrong. Second, even if one’s models do yield correct predictions at one time or in one place, the same model may generate incorrect predictions at another time or in another place. If so—and the comparative-historical study of economic development leads us to expect that such will be the rule rather than the exception—then a methodology is needed for studying, and learning from, differences in the relation between social conditions and economic performance over time and across institutional environments.

The most profound hypothesis emerging from the comparative-historical study of the development of advanced economies over the past century is that organizations—not markets—drive the process of economic development. A general theoretical implication of the organizational hypothesis is that positing the “perfect market economy” as the ideal set of conditions for superior economic performance, as indeed most economists do, is a fundamental error.

110. Lazonick, Business Organization; Lazonick, “Public and Corporate Governance.”
Joseph Schumpeter argued perceptively, well before the work of Penrose and Chandler served to bolster his position:

What we have got to accept is that [the large-scale enterprise] has come to be the most powerful engine of [economic] progress and in particular of the long-run expansion of total output not only in spite of, but to a considerable extent through, [a] strategy that looks so restrictive when viewed in the individual case and from the individual point of time. In this respect, perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency. 111

To develop a useful theory of innovative enterprise, there is a need for systematic comparative-historical research on the organizational, not to mention institutional, determinants of the processes that transform technological and market conditions to generate goods and services that are higher quality and lower cost than those that previously existed.

As I have shown, the transaction-cost perspective of Oliver Williamson, transformed through the use of a historical-transformation methodology to make technology (asset specificity), cognition (bounded rationality), and behavior (opportunism) endogenous rather than exogenous to the enterprise, can provide an important framework for understanding the evolution of the innovative enterprise. Indeed, in their book Firms, Markets, and Economic Change Richard Langlois and Paul Robertson have explicitly sought to integrate business history and transaction-cost theory to generate what they call a “dynamic theory of business institutions.” 112

Both Alfred Chandler and Edith Penrose, focusing primarily (although not exclusively) on the evolution of the U.S. industrial corporation during the first half or so of the twentieth century, have shown the importance of an understanding of the role of managerial organization for the behavior and performance of the innovative enterprise. In combination, their work shows the need to analyze the role of managerial organization in both the development and the utilization

of productive capabilities in a theory of innovative enterprise. Extending their analyses across nations and over time to the present, however, reveals the need to adopt a broader and deeper perspective on the types of organizational structures—one that includes the managerial structure but that may also extend into the production process and across related firms—to understand new modes of business organization that generate innovation.\textsuperscript{113} Moreover, the integration of the theory and history of innovative enterprise that builds on the Chandlerian and Penrosian perspectives forms a prelude for understanding how the very growth of the firm, the rise of new competition, and changes in the institutional environment may cause the innovative enterprise to reach the limits of its success and how those who control its allocation of resources respond to these challenges.\textsuperscript{114}

As we have seen, much of this work of integrating the theory and history of innovative enterprise is being done in business schools, often by scholars trained in economics who, in recognizing the importance of business strategy and structure to the pursuit of competitive advantage, have strayed from the neat and safe confines of constrained-optimization analysis as their exclusive methodological approach.\textsuperscript{115} With a historical-transformation methodology, the intellectual challenge is to expand this research agenda from a concern with how individual companies gain and sustain competitive advantage to a broader economic analysis of the social conditions related to financial, employment, and regulatory institutions that foster innovative enterprise. Systematic comparative-historical research is needed to understand what it is that the business enterprise does that can make it “the most powerful engine of progress,” and the social conditions under which such innovative outcomes do—or do not—occur.\textsuperscript{116}

I have also argued that in carrying out such a research agenda, the constrained-optimization methodology remains a useful tool: an

\begin{itemize}
\item \textsuperscript{114} See Lazonick and O’Sullivan, “Maximizing Shareholder Value”; O’Sullivan, \textit{Contests for Corporate Control}, chaps. 3–6; and Lazonick, “The U.S. Industrial Corporation.”
\item \textsuperscript{115} The most important journal for publication of this type of research is \textit{Industrial and Corporate Change}.
\end{itemize}
understanding of the industrial, organizational, and institutional conditions that "constrain" economic activity at a point in time can help us be more systematic in analyzing how, why, and under what conditions certain "constraints" are transformed over time. As a dominant methodology, however, constrained-optimization can become an excuse for ignoring history, when what is required is a methodology that both uses theory to explore history and uses history to reshape theory.

Finally, the development of a methodology designed to integrate theory and history can help historians and economists who are concerned with the processes of innovation and economic development to work together without creating an artificial, and often destructive, distinction between what constitutes "theory" and what constitutes "history." As Edith Penrose put it in an article written late in her career,

"Theory" is, by definition, a simplification of "reality" but simplification is necessary in order to comprehend it at all, to make sense of "history." If each event, each institution, each fact, were really unique in all aspects, how could we understand, or claim to understand, anything at all about the past, or indeed the present for that matter? If, on the other hand, there are common characteristics, and if such characteristics are significant in the determination of the course of events, then it is necessary to analyse both the characteristics and their significance and "theoretically" to isolate them for that purpose.

If we need theory to make sense of history, so we also need history to make sense of theory. As Penrose concluded: "universal truths without reference to time and space are unlikely to characterise economic affairs."


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