



Understanding Innovative Enterprise

Toward the Integration of Economic Theory and Business History

WILLIAM LAZONICK

What determines the growth of an economy? How does a society share among its members the costs of generating economic growth and the benefits that are derived from it? These fundamental questions of growth and distribution are as old as the discipline of economics. But modern economics has not been very successful in providing cogent answers. The main problem is that the conventional theory of the market economy lacks a theory of economic development.

This intellectual deficiency is neither inevitable nor accidental. During the nineteenth century, the elaboration of a theory of economic development was the central project of what came to be called "classical" economics. But during the twentieth century, the economics discipline displayed an ever-growing commitment to the individualistic ideology and ahistorical methodology of "neoclassical" economics. Given these ideological and methodological orientations, adherents to the neoclassical

The original version of this essay was prepared for the conference "Business History around the World at the End of the Twentieth Century," Milan, October 15-17, 1998. A revised version was presented at the Business History Workshop, Saïd Business School, University of Oxford, March 19, 1999. The substantial elaboration, amendment, and refinement of the arguments in this essay have been made under a grant from the Targeted Socio-Economic Research Programme of the European Commission, DGXII, Contract No. SOE1-CT98-1114. I am grateful to Louis Galambos and Mary O'Sullivan for comments on various drafts.

perspective neglected to build a theory of economic development that can comprehend the historical experiences of economic growth and income distribution in the world's most advanced national economies.¹

Indeed, the neoclassical research agenda by its very definition – the study of *the allocation of scarce resources among competing uses* – places the process of economic development beyond its analytical scope. Using this definition, conventional economic analysis assumes that, in the determination of economic performance, technological and market conditions can be taken as exogenous. The neoclassical economist takes the “scarcity” of resources – technology – and the “competing” uses to which they can be allocated – markets – as given constraints in the resource allocation process. Economic actors are assumed to operate subject to these exogenously determined constraints as they seek to optimize their objectives.

In contrast, a theory of economic development takes as given neither the quantity nor the quality of productive resources available, nor the uses to which these resources can be applied. Economic development occurs through the transformation of prevailing technological and market conditions so that higher-quality, lower-cost goods and services become available to enhance the standards of living of the society's population. The neoclassical economist considers as optimal those outcomes that reflect responses to *given* technological and market conditions. Yet it is precisely such optimal outcomes that must be changed for the wealth of nations to grow.

A theory of economic development indicates how transformations of technologies and markets occur and how these transformations affect the creation and distribution of income and wealth. The quest for such a theory raises a number of key questions for empirical analysis, with methodological implications for how this research is to be performed:

- What technological and market conditions stand in the way of economic development at any point in time? The very notion that conditions that constrained economic activity at a point in time can be transformed to generate economic development means that the study of the economy requires a *historical analysis of the process of change*.²

¹ I have elaborated on this argument in William Lazonick, *Business Organization and the Myth of the Market Economy* (New York, 1991).

² Such was the great analytical insight of Joseph A. Schumpeter. For a discussion of Schumpeter's ideas on historical analysis, see Lazonick, *Business Organization*, 122–30,

- Are such historical transformations the work of entrepreneurial individuals, innovative enterprises, nonprofit institutions, or developmental states? The answer to this question determines the social units of analysis that are the foci of our research and ultimately permits us to determine *how different social units interact in the process of economic development*.

I call the analytical approach that seeks to integrate theory and history in this way the “historical-transformation methodology” – an approach that stands in sharp contrast to the constrained-optimization methodology that conventional economists use to analyze the economy. In this essay, I offer a perspective on the interaction of different social units in the historical-transformation process. In particular, I focus on the role of *innovative enterprise*, as distinct from entrepreneurial individuals, nonprofit organizations, and developmental states, in this historical-transformation process. I argue that the innovative enterprise is a *social organization* that is central to the processes of change that results in economic development and that, as a social organization, its investment strategy, organizational structure, and productive capabilities reflect to some extent the institutional environment in which it operates.³

How then do we analyze innovative enterprise? Innovation entails the transformation of productive inputs into salable outputs to generate products and services that are higher in quality – more desirable to users – and lower in cost – more affordable to users – than the previously attainable quality/cost of these goods and services at prevailing factor prices. “Innovative enterprise” refers to the business organization, both within a firm as a distinct unit of strategic control and across an allied network of firms, that undertakes this transformation process. I shall argue that, whether within a firm or across a network of firms, innovation must be analyzed as a collective process requiring the *organizational integration* of the activities of large numbers of people who participate in a specialized division of labor.

and id., “The Integration of Theory and History: Methodology and Ideology in Schumpeter's Economics,” in *Evolutionary and Neo-Schumpeterian Approaches to Economics*, ed. Lars Magnusson (Norwell, Mass., 1994), 245–63.

³ This insight, which is by no means readily apparent to someone trained in modern economic theory and analysis, derives from the work of business historians, the current state of the art of which is summarized in the contributions to this volume. See also *Big Business and the Wealth of Nations*, ed. Alfred D. Chandler, Jr., Franco Antonicelli, and Takashi Hikino (New York, 1997).

The particular types of specialized activities that the innovative enterprise integrates into a collective process depend on the particular transformations of prevailing technological and market conditions that current competitive conditions require. The intellectual challenge is to develop a theory of the social processes that transform *industrial* (technological, market, and competitive) conditions to yield innovative outcomes. The prime purpose of this essay is to articulate a theoretical perspective on those processes.

In the following section, drawing on research carried out by Mary O'Sullivan and me over the past several years, I outline what I call "the social conditions of innovative enterprise," or the "SCIE" perspective.⁴ Then I go on to consider how Edith Penrose's theory of the growth of the firm and Alfred Chandler's strategy-structure approach relate to the SCIE perspective. I conclude by briefly considering the relation of the SCIE perspective to two recent attempts by economists to bring economic theory and business history into closer relation to one another.

THE SCIE PERSPECTIVE

How does an innovative enterprise transform technological and market conditions to generate higher-quality, lower-cost products? To undertake the research that can begin to answer this fundamental question requires a theoretical perspective on the processes of historical transformation in which business organization is central. Given that business enterprises are social structures that are embedded in broader (typically national) institutional environments, the theory models the relations among *industrial conditions*, *organizational conditions*, and *institutional conditions* in the process of historical transformation. I thus provide a theoretical perspective on the social conditions of innovative enterprise. The fundamental assumptions, relations, and principles of the SCIE perspective are themselves derived from prior comparative-historical research.⁵ Central to this perspective is the specification of

⁴ See our elaboration of this perspective in William Lazonick and Mary O'Sullivan, "Perspectives on Corporate Governance, Innovation, and Economic Performance," report to the European Commission, Targeted Socio-Economic Research Programme, under contract number SOE1-CT98-1114 (<http://www.insead.edu/cgep/>).

⁵ William Lazonick and Mary O'Sullivan, "Organization, Finance and International Competition," *Industrial and Corporate Change* 5, no. 1 (1996): 1-49; id., "Finance and Industrial Development, Parts 1 and 2," *Financial History Review* 4, nos. 1 and 2 (1997): 7-39, 113-34; id., "Big Business and Skill Formation in the Wealthiest Nations: The Organizational

the key characteristics of the industrial, organizational, and institutional conditions that can promote or constrain the innovation process. The key characteristics are

- industrial conditions: *technological, market, and competitive*
- organizational conditions: *cognitive, behavioral, and strategic*
- institutional conditions: *employment, financial, and regulatory*

To understand how these different social conditions influence the innovation process, I also specify the key characteristics of that process. Drawing on the theoretical and empirical literature on innovation and relating it to resource allocation in the economy as a whole, Mary O'Sullivan has argued that the innovation process can be characterized as *cumulative, collective, and uncertain*.⁶ The innovation process is cumulative because the possibilities for transforming technological and market conditions today and tomorrow depend on the development of those conditions in the past. Hence, an innovative enterprise engages in cumulative learning. The innovation process is collective because the transformation of technological and market conditions requires the integration of large numbers of people with specialized knowledge and skills so that they interact to develop and utilize productive resources. Hence, an innovative enterprise engages in collective learning. The innovation process is uncertain because the cumulative and collective processes that can transform technological and market conditions to generate higher-quality, lower-cost products are unknown at the time when resources are committed to these processes. Hence, an innovative enterprise must be strategic in how it engages in cumulative and collective learning.

Revolution in the Twentieth Century," in *Big Business and the Wealth of Nations*, ed. Chandler, Amatori, and Hikino, 497-521; William Lazonick, "Organizational Learning and International Competition," in *Globalization, Growth, and Governance*, eds. J. Michie and J. G. Smith (Oxford, 1998), 284-34. For the development of the analysis of strategic control as a critical condition of innovative enterprise and the role of financial, employment, and regulatory institutions in setting social conditions through which strategic control affects the allocation of corporate resources and returns, see Mary O'Sullivan, *Contests for Corporate Control: Corporate Governance and Economic Performance in the United States and Germany* (Oxford, 2000).

⁶ See Mary O'Sullivan, "The Innovative Enterprise and Corporate Governance," *Cambridge Journal of Economics* 24, no. 4 (2000): 393-416, which analyzes the implications of the characterization of the innovation process as cumulative, collective, and uncertain for alternative theories of resource allocation and corporate governance as put forth by economists.

THE SYSTEM OF SOCIAL CONDITIONS

Industrial Conditions

"Technological conditions" refer to the productive capabilities, embodied in both human and physical capital, that characterize an industry or an enterprise within an industry at a point in time. "Market conditions" refer to the existing demand (in terms of quantity, quality, and price) for an industry's products and the existing supply of factors of production. "Competitive conditions" refer to the differential ability of enterprises in an industry or the same industries in different institutional environments to transform productive resources into revenue-generating products.

Innovation entails the transformation of existing technological and/or market conditions to generate higher-quality, lower-cost products. A successful enterprise transforms the competitive conditions facing other enterprises in the industry. These new competitive conditions may or may not induce an innovative response from rivals. Challenged by an innovative enterprise, the competitor's response may entail a strategy of either *adaptation* on the basis of the preexisting technological and market conditions or *innovation* by itself seeking to transform these conditions to generate higher-quality, lower-cost products.⁷

Organizational Conditions

"Cognitive conditions" refer to the cumulated knowledge and available skill base on which an enterprise can expect to develop and utilize its productive resources. "Behavioral conditions" refer to the set of incentives that can motivate participants in the enterprise to use their knowledge and skill to develop and utilize productive resources. "Strategic conditions" refer to the enterprise's structure of control over its financial, physical, and human resources. Embodying these organizational conditions within the enterprise is a division of labor based on different functional capabilities and hierarchical responsibilities, which is itself influenced by the combination of industrial and institutional conditions in which the enterprise has evolved.

The implementation of an innovative strategy to transform technological and market conditions entails strategic choices concerning (a) whose knowledge and skill within the organization will be developed

⁷ See Lazonick, *Business Organization*, chap. 3.

and utilized and (b) what incentives will be offered to these participants to motivate them to cooperate in the pursuit of enterprise goals. Hence, the process of transforming industrial conditions generally entails the transformation of cognitive and behavioral conditions, with the types of organizational transformations that take place depending on the competitive strategy of the enterprise.

Institutional Conditions

Financial institutions determine the ways in which a society allocates financial resources to states, enterprises, and individuals for investment and consumption, as well as the ways in which that society distributes financial returns to the holders of various forms of financial claims. Employment institutions determine how a society develops the capabilities of its present and future labor forces (and hence include education, research, and training systems), as well as how it structures the availability of employment and the conditions of work and remuneration. Regulatory institutions determine how a society assigns rights and responsibilities to different groups of people over the management of society's productive resources and how it imposes restrictions on the development and utilization of these resources.

A fundamental hypothesis that derives from the SCIE perspective is that institutional, organizational, and industrial conditions interact historically to determine a unique set of rights, responsibilities, and restrictions that characterize a particular economy and society in a particular era. This perspective hypothesizes that the historical emergence of institutional conditions related to finance, employment, and regulation reflect the changing requirements of business enterprises (and especially corporate enterprises in a society in which they dominate business activity) for the development and utilization of productive resources. Over time these financial, employment, and regulatory practices become institutionalized in laws and norms, as well as the practices of related nonbusiness organizations that play important roles in undertaking financial, employment, and regulatory functions. Insofar as they derive from the requirements of business organizations, these institutions become "embedded" in the financial, employment, and regulatory practices of these business organizations themselves. The SCIE perspective argues that, at a point in time, these social conditions determine the types of industrial transformations, and hence the types of industrial innovations, that can occur in the economy. Over time, however, the transformation of certain dimensions of

these institutional and organizational conditions – in effect transformations of what may be called the “political economy” – can open up new possibilities for innovative activity.

SOCIAL CONDITIONS OF INNOVATIVE ENTERPRISE

We can identify three social conditions of innovative enterprise: financial commitment, organizational integration, and strategic control. Financial commitment involves allocating financial resources to sustain the process that develops and utilizes productive resources until the resultant products can generate financial returns. The need for financial commitment derives directly from the cumulative character of the innovation process. Hence, a theory of innovative enterprise must show how, given the financial requirements of industrial transformation, institutions and organizations combine to provide the requisite financial commitment. Organizational integration involves creating incentives for participants to apply their skills to engage in interactive learning in pursuit of common goals. The need for organizational integration derives directly from the collective character of the innovation process. A theory of innovative enterprise must show how institutions and organizations combine to create the necessary incentives for those who must engage in interactive learning. Entailing as it does the combination of access to financial commitment and influence over organizational integration, strategic control enables people within an enterprise who possess certain “visions” of how technology and markets can be transformed to generate innovation to implement those visions as enterprise practice. The need for strategic control derives directly from the uncertain character of the innovation process.

The SCIE perspective posits a dynamic historical relation between organizations and institutions. One can in principle treat the business enterprise as an independent social entity in analyzing the social conditions of innovative enterprise. To treat the enterprise as an independent social entity, however, would run the risk of ignoring how the institutional environment proscribes and enables the enterprise to acquire certain types of knowledge bases, to structure employment incentives for participants, and to consider strategic options. Thus, the SCIE perspective seeks to understand the dynamic interaction between business enterprises and the institutional environments in which they operate, as well as the implications of this interaction for the transformation of technological and market conditions in different industrial activities.

HISTORICAL-TRANSFORMATION METHODOLOGY

The very nature of the innovation process means that the social conditions that constrain or promote innovation change over time and vary across different productive activities. The theoretical analysis must be integrated with the historical study of the development process through an “historical-transformation methodology.”

The application of this methodology requires what Schumpeter called “historical experience.”⁸ This experience enables the analyst to make intelligent judgments concerning which conditions must be analyzed as endogenous to the process of change and which conditions can be treated as exogenous. In my own work, I have sought this experience not only through empirical studies of innovation and development⁹ but also through a critical evaluation of the efforts by other economists to integrate theory and history.¹⁰

A consideration of the work of Alfred Marshall (1842–1924) provides useful insights into the problems and possibilities of the two methodologies.¹¹ The most influential economist of his era, Marshall spent all of his adult life as a student and a professor at Cambridge University. Influenced by the concern with economic development of such classical economists as Adam Smith and John Stuart Mill, Marshall’s main empirical focus was the evolution of British industry. During the third quarter of the nineteenth century, Britain had emerged as the world’s leading industrial economy. After the turn of the twentieth century, with the rise of large-scale enterprise abroad, Marshall extended his study to comparisons of industrial organization in the United States, Germany, and France – nations that were challenging Britain’s economic leadership.¹²

On this empirical basis, Marshall elaborated a theory of economic development that had innovative enterprise at its core. At the same time, looking forward to what would become the dominant methodological approach in economics, Marshall sought to analyze how “substitution at the margin” would determine the optimal allocation of scarce resources. The crowning achievement of Marshall’s career was to combine these two

⁸ Joseph A. Schumpeter, *History of Economic Analysis* (Oxford, 1954), 12–13.

⁹ See William Lazonick, *Organization and Technology in Capitalist Development* (Aldershot, U.K., 1992).

¹⁰ See William Lazonick, *Competitive Advantage on the Shop Floor* (Cambridge, Mass., 1990), chaps. 1 and 2; id., *Business Organization*, chaps. 4–9.

¹¹ See Lazonick, *Business Organization*, chap. 5.

¹² See especially Alfred Marshall, *Principles of Economics*, 9th edition (London, 1961); id., *Industry and Trade* (London, 1919).

methodological approaches – historical transformation and constrained optimization – in one book, *Principles of Economics*, a treatise that, published in eight editions between 1890 and 1920, was the economics textbook for two generations.

Ironically, as it turned out, the work of Alfred Marshall was central to a critical transition in the economics discipline from the broad concern of the classical economists with its focus on economic development to the narrow focus of neoclassical economists on the optimal allocation of scarce resources among alternative existing uses. At the microeconomic core of this transition was a shift in Marshall's analysis from a theory of innovative enterprise to a theory of the optimizing firm.¹³ The Marshallian analysis of the firm that optimizes subject to technological and market constraints, as further elaborated by Marshall's followers, remains embedded in the economics textbooks of today, while the constrained-optimization methodology is, in the words of one well-known industrial organization economist, "mother's milk to the well-trained economist."¹⁴ As a result, the mainstream of the economics profession has focused almost exclusively on the theory of the optimizing firm – as if it were an ideal to be pursued rather than a condition to be transformed – to the neglect of a theory of innovative enterprise. The intellectual result has been that, for the "well-trained economist," acuity in the use of the constrained-optimization methodology has been accompanied by a trained incapacity to employ an historical-transformation methodology.

These two methodologies need not be mutually exclusive – so long as it is recognized that the constrained optimization methodology cannot be used to analyze the innovation process per se. That methodology can function as a transitional analytical device for rendering tractable the complexities of historical transformation. The shift from innovative enterprise to optimizing firm can serve the purpose of providing a rigorous and relevant analysis of the "constraints" on the development and utilization of productive resources that faced enterprises at a point in time. Then one could know what conditions facing the enterprise would have to be transformed over time for economic development to occur.¹⁵

¹³ See Lazonick, *Business Organization*, chap. 5.

¹⁴ Richard Caves, "Industrial Organization, Corporate Strategy and Structure," *Journal of Economic Literature* 18, no. 1 (1980): 88.

¹⁵ For an example, see William Lazonick, "Factor Costs and the Diffusion of Ring Spinning in Britain prior to World War I," *Quarterly Journal of Economics* 96, no. 1 (1981): 89–109, and the subsequent debates with Lars Sandberg in the *Quarterly Journal of Economics* 99, no. 2 (1984): 387–92; and with Gary Saxonhouse and Gavin Wright in *Economic*

On the basis of such a methodology, the static optimizing analysis with which Marshall concluded his *Principles of Economics* could have facilitated the transition to a dynamic developmental analysis comprehending the role of innovative enterprise in the ongoing structural transformation of the economy. Rather than make this *transition* from optimizing firm to innovative enterprise, however, the followers of Marshall, and subsequent generations of economists, accepted the theory of the optimizing firm as a sufficient mode of analysis of the role of the business enterprise within the economy.

Using the historical-transformation methodology, what is the unit of analysis for understanding innovative enterprise? In nineteenth-century Britain, as Marshall recognized, innovative enterprise occurred within industrial districts rather than within industrial corporations. The sources of development were mainly external to any particular firm but internal to a particular region. Yet from the late nineteenth century on, in various places around the world, the focus of innovative enterprise shifted from the industrial district to the industrial enterprise. The transformation of innovative proprietary enterprises into managerial corporations allowed nations such as Germany, the United States, and Japan to become global economic leaders in the twentieth century.

Quite incongruously, the historical transition from industrial districts to dominant corporations as the organizational units in the developmental economy was accompanied by a theoretical transition within economics from a developmental approach to an obsession with conditions of equilibrium in general and the optimizing firm in particular. Thus economists avoided an analysis of, among other things, the historical reality and theoretical implications of the managerial revolution. This is not to say that, armed with the historical-transformation methodology, economists or historians should assume that the dominant industrial corporation is the only relevant organizational unit of analysis. To capture the full range of possibilities for innovative enterprise in the twentieth century and beyond, a relevant theory of innovative enterprise must also be able to account for, as the proponents of "flexible specialization" have sought to do,¹⁶ innovative industries, regions, and even nations in which

History Review, 2nd ser., 40, no. 1 (1987): 87–94. See also William Mass and William Lazonick, "The British Cotton Industry and International Competitive Advantage: The State of the Debates," *Business History* 32, no. 4 (1990): 9–65; and, more generally, Lazonick, *Organization and Technology*, part 1.

¹⁶ For a recent elaboration of the flexible-specialization approach, see Charles E. Sabel and Jonathan Zeitlin, eds., *World of Possibilities: Flexibility and Mass Production in Western*

the dominant corporate enterprise remains the exception rather than the rule.

THE MODERN CORPORATION AS INNOVATIVE ENTERPRISE

In Edith Tilton Penrose's book *The Theory of the Growth of the Firm*, first published in 1959, the author elaborated on a theory of the operation and performance of the modern corporation as an evolving developmental organization. Penrose's now classic book contains numerous testable hypotheses for empirical investigation. Unfortunately the economics profession has largely ignored the developmental dimensions of her work¹⁷ – a neglect that is not surprising given the intellectual hegemony of the constrained-optimization approach.

Fortunately, coming from business history rather than economics, Alfred Chandler has synthesized the historical evidence on the evolution of the modern corporation in ways that provide unprecedented insights into the characteristics of innovative enterprise in the twentieth century. Chandler has circumscribed his theoretical contribution to our understanding of the modern corporation, however, by his use of *theoretical* constructs that emphasize the utilization of productive resources to the neglect of the development of productive resources. The theoretical concepts such as "first-mover advantage" and "economies of scale and scope" that Chandler employs derive from an empirical tradition in industrial organization that has neither confronted the limits of the constrained-optimization methodology nor developed an historical-transformation methodology.

Both Penrose and Chandler placed heavy emphasis on American-style "managerial organization" as it prevailed in the 1950s.¹⁸ In their choice

Industrialization (Cambridge, 1997). For my review of this book, see *Business History Review* 73, no. 2 (1999): 309–14.

¹⁷ But see the special issue of *Contributions to Political Economy* 18 (2000), edited by Christos Pitelis, devoted to a consideration of Penrose's book from a developmental perspective. See also William Lazonick, "The U.S. Industrial Corporation and *The Theory of the Growth of the Firm*," in *The Growth of the Firm: The Legacy of Edith Penrose*, ed. Christos Pitelis (Oxford, 2002), 249–78, as well as the papers from the European Institute of Business Administration (INSEAD) Penrosian Legacy Conference, May 11–12, 2001 (<http://www.insead.fr/events/penrose>).

¹⁸ It is worth noting that Penrose researched and wrote *The Theory of the Growth of the Firm* in the 1950s while a researcher and lecturer in the Department of Political Economy of Johns Hopkins University, the same university where Chandler was a professor in the

of subject matter and in their approaches to the study of the modern corporate enterprise, both Penrose and Chandler have created important intellectual foundations for the analysis of innovative enterprise. In different ways, the work of each of these scholars demonstrates the need for a theory of innovative enterprise that can comprehend the historical transformation of not only *industrial and organizational* but also *institutional* conditions in the innovation process. The analysis of the role of innovative enterprise in the historical transformation of industrial, organizational, and institutional conditions that would otherwise constrain innovation must be central to a research agenda that seeks to integrate business history into a theory of economic development.¹⁹

Department of History from 1963 to 1971. Nevertheless, one had little intellectual influence on the 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 *Theory* "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 *The Essential Alfred Chandler*, ed. T. McCraw (Boston, 1988), 498 n., and the reference to Penrose's case study of Hercules Powder Company in Alfred D. Chandler, Jr., *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass., 1990), 758 n. 67. In the foreword to the third edition of *Theory* (p. 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 she 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 of 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." Edith Penrose, *The Theory of the Growth of the Firm* (Oxford, 1995), 3rd edition, xiii. See also Edith Penrose, "The Theory of the Growth of the Firm Twenty-Five Years After," *Acta Universitatis Upsalensis: Studia Oeconomica Negotiorum*, no. 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*, 2nd ser., 4, no. 1 (1966): 3–14.

¹⁹ For the analysis (omitted from this essay due to space limitations) of the historical transformation of organizational conditions in the innovative enterprise, and for a related critique of the constrained-optimization methodology of Williamsonian transaction-cost economics for understanding the evolution and role of business organization in the economy, see William Lazonick, "The Theory of Innovative Enterprise," in *The International Encyclopedia of Business and Management Handbook of Economics*, ed. William Lazonick (London, 2002), 638–59. See also William Lazonick, "Innovative Enterprise and Historical Transformation," *Enterprise & Society* 3, no. 1 (2002): 3–47.

THE THEORY OF THE GROWTH OF THE FIRM

As an economist, Penrose saw her role as the elaboration of a theoretical framework on the basis of limited empirical data so that useful hypotheses could be posed for further study. She used eclectic sources, including business histories, to gain her theoretical insights.²⁰ But she did not prescribe a program for systematic research on the innovative enterprise, and remained vague about the empirical underpinnings of her own theoretical arguments.²¹

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.²² 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 can place the enterprise at a competitive disadvantage if the productive resources that the enterprise develops are not sufficiently utilized.

Compared with the neoclassical theory of the firm, 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*.²³ Penrose's perspective on the enterprise as managerial organization

²⁰ In particular, she stated in a footnote that "Charles H. Wilson's *History of General* (London, 1954) is a model of what good firm histories can be. I have leaned heavily on this type of work (and there are some others), as well as on direct discussions with businessmen, for insights into the processes of firm growth." Penrose, *Theory*, 5.

²¹ In the mid-1950s Penrose carried out a study of Hercules Powder Company, an enterprise that had been spun off from Du Pont Chemical Company in 1907 as a result of antitrust litigation and that, at the time of her study, ranked 165th in *Fortune* magazine's list of the 500 largest U.S. industrial companies. See Edith T. Penrose, "The Growth of the Firm - A Case Study: The Hercules Powder Company," *Business History Review* 34, no. 1 (1960): 1-23. The study was, in Penrose's words, "originally intended for inclusion in my *Theory of the Growth of the Firm*, but was omitted in order to keep down the size of the book." *Ibid.*, 1. There is no mention of the study or reference to Hercules Powder Company in any of the editions of *Theory*, including the third edition of the book, published in 1995 with a new foreword by the author.

²² See O'Sullivan, *Contests*, chap. 1.

²³ As Penrose puts it 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 management assumed to be committed to the long-run interest of the firm, the function of shareholders being simply to ensure the supply of equity capital. Dividends need only be sufficient to induce investment in the firm's shares." Penrose, *Theory*, xii.

represents an important advance on economic theories of the firm in which social organization plays no role.²⁴

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 organizational learning means 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 broader and deeper skill bases affected international competitive advantage and national economic performance.²⁵ 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. As a result, her perspective is ill equipped to comprehend the erosion of cohesive managerial organization in major U.S. industrial corporations that occurred in the 1980s and 1990s. The characteristic feature of this managerial "downsizing" is that the services of once-valued "human assets" are thrown on the market rather than being mobilized for the further growth of the firm or even for the strategic creation of "spin-off" firms.²⁶

Penrose assumes throughout her book that the modern industrial corporation will always try to utilize the unused productive resources at its disposal. She also understands, however, 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. But 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, either because of a separation of strategic decision making from organizational learning or because of the emergence of new competitors with superior organizational capabilities.²⁷ Penrose equates the profit motive

²⁴ For the argument that Penrose's theory of the growth of the firm is a theory of innovative enterprise as I have defined it, see Lazonick, "U.S. Industrial Corporation."

²⁵ See Lazonick and O'Sullivan, "Organization, Finance, and International Competition"; *id.*, "Big Business and Skill Formation."

²⁶ For an elaboration of this assessment of Penrose's analysis in terms of the evolution of the U.S. industrial corporation since the time she wrote her book, see Lazonick, "U.S. Industrial Corporation."

²⁷ O'Sullivan, *Contests*, chap. 5.

and the growth motive in determining the investment strategy of the firm.²⁸ But this equation holds 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 themselves – by shedding unused productive resources – that is, those human assets whose services those who exercise strategic control deem to be no longer of value.

As Penrose recognized in the Foreword to the 1995 edition of her book, writing in the late 1950s one had yet to witness the advent in the United States of the conglomeration movement of the 1960s, the subsequent divestments 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.²⁹ It may be that many of these practices have reflected a tendency for established U.S. industrial corporations to favor competitive strategies that are "optimizing," or more realistically "adaptive,"³⁰ as opposed to those that are innovative.³¹ Rather than confront new industrial, organizational, and institutional conditions by engaging in strategies to transform them, those who control corporate resources may see it as in their interests to view these conditions as constraints, and consequently may be content to optimize subject to them.

What is optimal for those who control corporate resources, however, may not be optimal for other people associated with the corporation or for the economy as a whole – thus raising the question of the relation between corporate strategy and the development of the economy, a central issue that a theory of innovative enterprise must address. One way of conceptualizing Penrose's theory of the growth of the firm is to ask how, by transforming technology and markets, a small number of innovative enterprises might be able to differentiate themselves from other firms

²⁸ Penrose, *Theory*, 26–30.

²⁹ See William Lazonick and Mary O'Sullivan, "Maximising Shareholder Value: A New Ideology for Corporate Governance," *Economy and Society* 29, no. 1 (2000): 13–35.

³⁰ Lazonick, *Business Organization*, chap. 3.

³¹ But for an analysis of "new economy" corporations, such as Intel, Microsoft, and Cisco Systems, that emerged in the last decades of the twentieth century as innovative enterprises and that, in the speculative stock market of the late 1990s, in effect destroyed shareholder value as they used high-priced stock as a currency to accumulate innovative capabilities, see Marie Carpenter, William Lazonick, and Mary O'Sullivan, "The Stock Market, Corporate Strategy, and Innovative Capability in the 'New Economy,'" INSEAD Working Paper, 2002/66/SM, April 2002.

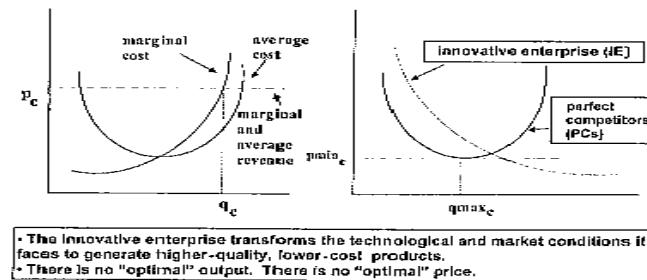


Figure 1 Transforming the conventional theory of the firm. Technological and market conditions are given by cost and revenue functions. The good manager optimizes subject to technological and market constraints. p = price; q = output; m = monopolist; c = perfect competitor; p_{min} = minimum breakeven price; q_{max} = maximum breakeven output.

in an industry to gain sustained competitive advantage (Figure 1).³² It is with the economic performance of such an innovative enterprise that the optimizing firm of neoclassical theory should be compared. To do so, the theory of innovative enterprise must have an analysis of the determinants of total fixed costs, as well as the relation between average fixed costs and average variable costs during the innovation process. The task for a theory of innovative enterprise is to explain how, by changing its cost structure, a particular enterprise can emerge as dominant in its industry.

Unlike the optimizing firm, the innovative enterprise does not take as given the fixed costs of participating in an industry. Rather, given prevailing factor prices, the level of fixed costs that it incurs reflects its innovative strategy. This "fixed-cost" strategy is not dictated by indivisible technology or the entrepreneur as a fixed factor, but rather by the innovative enterprise's assessment of the quality and quantity of productive resources in which it must invest to develop products that are higher in quality and lower in cost than those that it had previously been capable of producing and that (in its estimation) its competitors will be able to produce, given *their* investment strategies. It is this development of productive resources within the enterprise that creates the potential

³² The following arguments are developed in much more detail, including critiques of the neoclassical "monopoly model" and Williamsonian transaction-cost theory, in Lazonick, "Theory of Innovative Enterprise."

for an enterprise that pursues an innovative strategy to gain a sustained competitive advantage over its competitors and emerge as dominant in its industry.

Such development, when successful, becomes embodied in products, processes, and people with productive capabilities superior to those that had previously existed. But even the generation of superior productive capabilities will not result in sustained competitive advantage when innovative competitors have generated even superior productive capabilities and/or when the high fixed costs of the innovative strategy place the innovative enterprise at a cost disadvantage relative to less innovative, or even optimizing, competitors. An innovative strategy that enables the enterprise to generate superior productive capabilities may place that enterprise at a cost disadvantage because innovative strategies tend to entail higher fixed costs than those incurred by rivals that optimize subject to given constraints.

For a given level of factor prices, these higher fixed costs derive from the size and duration of the innovative investment strategy. Innovative strategies tend to entail higher fixed costs than those incurred by the optimizing firm because the innovation process tends to require the simultaneous development of productive resources across a broader and deeper range of integrated activities than those undertaken by the optimizing firm. Hence, at a point in time, the innovative enterprise must generally make a broader range of investments in fixed plant and equipment and a deeper range of investments in administrative organization than would have to be undertaken by the optimizing firm. But in addition to, and generally independent of, the size of the innovative investment strategy at a point in time, high fixed costs will be incurred because of the amount of time required to develop productive resources until they result in products that are sufficiently high in quality and low in cost to generate returns. If the size of investments in physical capital tends to increase the fixed costs of an innovative strategy, so too does the duration of the investment in an organization of people who can engage in the collective and cumulative – or organizational – learning that is the central characteristic of the innovation process.

The high fixed costs of an innovative strategy create the need for the enterprise to attain a high level of utilization of the productive resources that it has developed. As in the neoclassical theory of the optimizing firm, given the productive capabilities that it has developed, the innovative enterprise may experience increasing costs because of the problem of maintaining the productivity of variable inputs as it employs larger quantities of these inputs in the production process. But rather than, as in the case

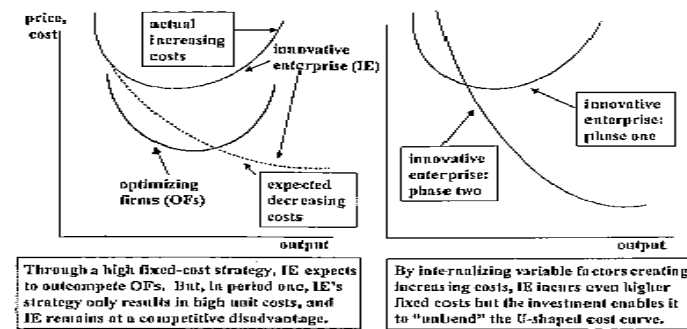


Figure 2 Industrial transformation: technology, markets, and innovative enterprise.

of the optimizing firm, taking increasing costs as a given constraint, the innovative enterprise will attempt to transform its access to high-quality productive resources at high levels of output. To do so, it will invest in the development of that productive resource, the utilization of which as a variable input has become a source of increasing costs.

The development of the productive resource adds to the fixed costs of the innovative strategy, whereas previously this productive resource was utilized as a variable factor that could be purchased at the going factor price incrementally on the market as extra units of the input were needed to expand output. Having added to its fixed costs in order to overcome the constraint on enterprise expansion posed by increasing variable costs, the innovative enterprise is then under even more pressure to expand its share of the market in order to transform high fixed costs into low unit costs. As, through the development and utilization of productive resources, the enterprise succeeds in this transformation, it in effect "unbends" the U-shaped cost curve that the optimizing firm takes as given (Figure 2³³). By shaping the cost curve in this way, the innovative enterprise creates the possibilities for gaining a competitive advantage over its rivals.

Hence the innovative enterprise is not constrained by market demand to produce at the profit-maximizing output level where marginal cost equals marginal revenue because, over the long run, it is not subject to increasing costs. The innovative enterprise may be subject to increasing

³³ For a fuller theoretical elaboration of this process of sustained innovative transformation, see Lazonick, *Business Organization*, chap. 3.

costs in the short run, but by continually confronting and transforming those technological and market conditions that result in increasing costs, the innovative enterprise can generate high-quality products, the unit costs of which decline as it gains larger and larger market shares. The innovative enterprise thus not only has differentiated itself from its competitors but also has gained a sustained competitive advantage that is reinforced as it expands its level of output.

The ability of the innovative enterprise to achieve decreasing costs even as it produces larger volumes of output relative to the size of the industry's market means that the neoclassical optimizing rule that marginal cost equals marginal revenue is irrelevant to its output and pricing decisions. Constraining its level of output at a point in time is typically the presence in the industry of a small number of other innovative enterprises that compete among themselves for market share. Given the cost structure that it has put in place, the innovative enterprise can seek to increase its market share by offering buyers lower prices. But constraining such price reductions at a point in time is the need of the innovative enterprise to generate sufficient surplus revenues to reward its employees at levels above and beyond those that their labor services would fetch on the open labor market while investing in new technology, including the skills of workers, and building an organization to develop and utilize the new technology. Such investments can enable the enterprise to maintain or extend its competitive advantage in a given market or transfer some of its productive capabilities to produce output for another market that can make use of these capabilities. Insofar as the enterprise undertakes an innovative strategy in this diversification process, it will have to complement its existing capabilities with investment in, and development of, new capabilities, thus adding to the fixed costs that it must utilize to achieve low unit costs.

EXPLOITATION OF THE ECONOMIES OF SCALE AND SCOPE

As an historian, Chandler saw his role as the synthesis of the details of "a multitude of case-studies [to yield] generalizations and concepts that are not tied to a specific time and place."³⁴ In his three major books and many related publications written over a period of four decades, Chandler

³⁴ Alfred D. Chandler, Jr., "Comparative Business History," in *Enterprise and History*, eds. D. C. Coleman and Peter Mathias (Cambridge, 1984), 3.

integrated a massive amount of historical knowledge on the evolution of the industrial corporation, especially in the United States but also in Britain and Germany, into his "strategy and structure" framework. But he left it to, as he put it, "[the] economist, sociologist, or management scientist [to] deduce hypotheses or theorems *a priori* from an existing body of theory which is then tested with empirical data."³⁵

From the perspective of the history of innovative enterprise, *The Visible Hand* is Chandler's most successful work. 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.³⁶ Chandler's work has demonstrated the centrality of the "managerial revolution" to the evolution 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: "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."³⁷ 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.³⁸

On the theoretical plane, in *The Visible Hand*, Chandler emphasizes "economies of speed" in the utilization of productive resources, but he does not extend his analysis to the shop floor. In my own work, Chandler's focus on economies of speed permitted me to link my research on the development and utilization of productive resources on the shop floor with

³⁵ *Ibid.*, 26.

³⁶ Chandler's attempt at comparative analysis in *Scale and Scope* is greatly weakened by his lack of a similar familiarity with the social conditions surrounding the evolution of British and German industrial enterprises. See William Lazonick, "The Enterprise, the Community, and the Nation: Social Organization as a Source of Global Competitive Advantage" (paper presented to the Harvard Business School Business History Seminar, December 1991); Barry Supple, "Scale and Scope: Alfred Chandler and the Dynamics of Industrial Capitalism," *Economic History Review* 44, no. 3 (1991): 500–14; and the contributions to "Scale and Scope: A Review Colloquium," *Business History Review* 64, no. 3 (1990): 690–755.

³⁷ Chandler, *Visible Hand*, 1.

³⁸ *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.

his research on managerial organization.³⁹ Yet, given that in the twentieth century most U.S. industrial corporations pursued strategies of utilizing rather than developing human resources on the shop floor, it is therefore ironic that my greatest problem with Chandler's more recent attempts to place his research in a theoretical perspective revolves around his neglect of the *development* of productive resources as a source of competitive advantage. In *Scale and Scope*, published in 1990, the central analytical concept, "economies of scale and scope" (replacing his previous, more dynamic, notion of economies of speed), reflects Chandler's overemphasis on the *utilization* of productive resources as the distinctive contribution of the modern corporation to economic development.

Chandler's theoretical perspective contains no 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 if, even within a particular industry, capital intensity were not to some extent a result of the investment strategies and organizational structures of particular enterprises. But how did these new technologies that created the potential for economies of scale and scope get developed? Once one recognizes that it is the innovative strategy of the enterprise that creates the extent of its high fixed costs, economies of scale and scope must be seen not only as a *potential* source of competitive advantage but also as a *necessity* for an innovative enterprise to attain a competitive advantage. If the enterprise does not spread the high fixed costs of developing new technology over large quantities of sold output, then the enterprise that pursues an innovative strategy will be at a competitive disadvantage, not a competitive advantage.⁴⁰ Moreover, as Penrose recognized, in diversifying its products, the innovative enterprise must invest in the development of new productive resources, so that the quest for economies of scope constantly creates a new necessity to achieve economies of scale.

Economies of scale and scope are therefore *outcomes* of the innovation process that need to be explained. To be sure, in all of 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 a theoretical explanation. The shortcomings of Chandler's theorizing on the basis

³⁹ Lazonick, *Competitive Advantage*.

⁴⁰ See the previous discussion of the innovative enterprise and the theoretical analysis in Lazonick, *Business Organization*, chap. 3 and id., "Theory of Innovative Enterprise."

of his historical work are evident in his article "Organizational Capabilities and the Economic History of the Industrial Enterprise," published in *Journal of Economic Perspectives* in 1992 and directed at the economics profession.⁴¹

As Chandler recognizes in this article, it is the organization of the enterprise that permits it to achieve economies of scale and scope. But what does enterprise organization do? Chandler makes use of the concepts of "organizational capabilities" and "organizational learning." But what do such capabilities and learning accomplish? The internal organization of the U.S. industrial enterprise during much of the twentieth century led Chandler, like Penrose, to stress the role of the managerial organization in the learning process. For Chandler, however, managerial learning is related to the *utilization*, not the *development*, of productive resources:

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 constantly 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. As Chandler argues:

The first firms to make the three-pronged investments in manufacturing, marketing, and management essential to exploit fully the economies of scale

⁴¹ Alfred D. Chandler, Jr., "Organizational Capabilities and the Economic History of the Industrial Enterprise," *Journal of Economic Perspectives* 6, no. 3 (1992): 79–100.

⁴² *Ibid.*, 83.

⁴³ *Ibid.*, 83–4.

and scope quickly dominated their industries. Most continued to do so for decades.⁴⁴

But the notion of a "three-pronged investment" raises more theoretical questions than it answers. What were the capabilities that were developed by these three-pronged investments? Again, Chandler's formulation of the source of first-mover advantage creates the strong impression that what mattered was only skills and knowledge for the utilization of productive resources, not for the development of productive resources. 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. Indeed, 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

THEORY AND HISTORY

In a perceptive essay written in the mid-1980s,⁴⁶ Edith Penrose articulated the need for a methodology that integrated theory and history:

It is impossible for economic historians to select and make sense of the "facts" of history without the aid of the theories developed by students of economic affairs defined in the broader sense. Some of the "theory" may be little more than dressed-up common-sense deductions from common observations and

⁴⁴ *Ibid.*, 81.

⁴⁵ *Ibid.*, 99.

⁴⁶ Edith Penrose, "History, the Social Sciences and Economic 'Theory', with Special Reference to Multinational Enterprise," in *Historical Studies in International Corporate Business*, eds. Alice Teichova, Maurice Lévy-Leboyer, and Helga Nussbaum (Cambridge, 1989), 7-13.

therefore not even recognized as such, but much of it has a deeper significance. Without theoretical analysis of cause and consequence one has no standard against which to appraise the significance of any given set of observations, for this significance is a question of what difference the observations make to what might otherwise have been the historical interpretation.

Yet attempts to employ, and develop, such an integrative methodology are very rare among economists or historians. I shall conclude this essay by mentioning two recent efforts - one by Richard Langlois and Paul Robertson and the other by Naomi Lamoreaux, Daniel Raff, and Peter Temin - to illustrate the distinctive hypotheses for further research that derive from the theory of innovative enterprise that I have put forth.

The effort to integrate economic theory and business history that comes closest to the perspective that I have put forward is that of Richard Langlois and Paul Robertson.⁴⁷ Focusing on the question of why two or more distinct vertically related activities that could be performed by two or more distinct firms might be integrated into one firm, Langlois and Robertson invoke a process that they call "systemic innovation." They argue that "dynamic transaction costs" solves a coordination problem in the presence of the need for a systemic change. Systemic innovation requires the simultaneous change in a number of stages of production at once, and the individual actors who need to be involved in this change would not be able or willing to make the change without coordination. As Langlois and Robertson state:

The firm overcomes the "dynamic" transaction costs of economic change. It is in this sense that we may say the firm solves a coordination problem: it enables complementary input-holders to agree on the basic nature of the system of production and distribution of the product. It provides the structure in a system of structured uncertainty.⁴⁸

More specifically, dynamic transaction costs are, according to Langlois and Robertson, "the costs of persuading, negotiating, coordinating, and teaching outside suppliers."⁴⁹

On the surface, it may appear that Langlois and Robertson's "dynamic transaction cost" theory is very similar to the theory of innovative enterprise that I have set out. In fact, they do not provide a theory of the

⁴⁷ Richard N. Langlois and Paul Robertson, eds., *Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions* (London, 1995).

⁴⁸ *Ibid.*, 4.

⁴⁹ *Ibid.*, 35.

relation between organizational strategy and organizational learning. As a result, Langlois and Robertson put forth a dubious explanation of organizational integration – in this case, specifically vertical integration – as a relation among previously independent firms that exogenous technology imposes on participants in a specialized division of labor.

The first problem is that Langlois and Robertson provide no theoretical perspective on how, when, and why systemic innovation appears. For them, the appearance of a systemic innovation in a particular industry simply imposes an “innovative strategy” on firms that these firms are compelled to adopt if they want to remain competitive participants in that industry. The second problem is that, given the purported necessity for firms to adopt the systemic innovation, there is no learning in the Langlois–Robertson theory that goes beyond a core firm “teaching” its outside suppliers that they can no longer remain independent firms but must join the vertically integrated firm. The assumption is that, given a choice, firms will want to remain independent of one another. As Langlois and Foss have recently written, “Langlois and Robertson (1995) build a broad theory of industrial dynamics around [the] idea” that

much vertical integration occurs not when firms venture into new areas of similar capabilities but when firms are dragged, kicking and screaming, as it were, into complementary but dissimilar activities because only in that way can they bring about a profitable reconfiguration of production or distribution.⁵⁰

The appearance of a systemic innovation leads a firm that plays the role of systems integrator to convince independent suppliers that they must give up their independence. The implicit assumption is that when such a change in vertical relations occurs, the presumed benefits of systemic innovation will be to some extent offset by the dynamic transaction costs of overcoming the resistance of highly individualistic firms.

The desire to remain independent is a *possible* behavioral characteristic of the firm. But it is a characteristic that has to be demonstrated rather than assumed. Moreover, there are large literatures on supplier relations and strategic alliances that demonstrate that innovation can occur through cooperation across legally independent firms as well as within a firm as a distinct legal entity.⁵¹ Indeed, for a theory of innovative

⁵⁰ Richard Langlois and Nicolai Foss, “Capabilities and Organization: The Rebirth of Production in the Theory of Economic Organization,” *Kyklos* 52 (1999): 201–18.

⁵¹ See, for example, Mari Sako, “Supplier Development at Honda, Nissan, and Toyota: A Historical Case Study of Organizational Capability Enhancement,” working paper, Saïd

enterprise, the biggest problem with the Langlois–Robertson perspective is that they treat the firm as if it were a unitary actor – that is, an individual – and hence do not put forth any framework or agenda for exploring the organization of individuals who occupy positions within the specialized divisions of labor within firms. The lack of such a perspective is problematic for an organization made up of only two people (think of a married couple), never mind a business enterprise with tens of thousands of employees. The willingness to see the firm as an individual reflects an individualistic bias in the analysis of “industrial dynamics” that avoids such critical issues as (a) the structure of strategic control within an enterprise and the process of strategic decision making, (b) the transformation of individual learning into organizational learning in the innovation process, and (c) the transformation of organizational learning into higher-quality, lower-cost products, thus transforming the high fixed costs of an innovative strategy into the basis for competitive advantage (see Figures 1 and 2).⁵² Indeed, I would argue that an understanding of how an innovative enterprise develops and utilizes productive resources across firms as distinct units of strategic control will depend on the evolution of these capabilities within a dominant firm or firms within this network of relations.

Another important effort to link business history and economic theory is that of Naomi Lamoreaux, Daniel Raff, and Peter Temin (hereafter LRT). During the 1990s, under the auspices of the National Bureau of Economic Research, they organized a series of three conferences, all of which subsequently appeared as edited books,⁵³ the purpose of which was to encourage economists to build more informed theoretical models of business behavior through familiarity with the stories that business historians had to tell. LRT succeeded in articulating some important lessons

Business School, University of Oxford, 1998; Yves Doz, “The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning Processes,” *Strategic Management Journal* 17 (1996): 53–83.

⁵² See Lazonick and O’Sullivan, “Perspectives on Corporate Governance.”

⁵³ Peter Temin, ed., *Inside the Business Enterprise* (Chicago, 1991); Naomi R. Lamoreaux and Daniel M. G. Raff, eds., *Coordination and Information* (Chicago, 1995); Naomi R. Lamoreaux, Daniel M. G. Raff, and Peter Temin, eds., *Learning by Doing in Markets, Firms, and Countries* (Chicago, 1999). For a summary of the lessons derived from this project, see Naomi R. Lamoreaux, Daniel M. G. Raff, and Peter Temin, “New Economic Approaches to the Study of Business History,” *Business and Economic History* 26, no. 1 (1997): 57–79, which contains references to all of the papers that would subsequently appear in the third volume, published in 1999. An abridged version of this article that omits the discussion of the findings of the first two volumes in the series appears as the introduction to *Learning by Doing*.

of business history for the analysis of innovative enterprise. They do so, however, *despite* their uncritical advocacy of a theoretical model rooted in neoclassical ideology and methodology – a model that is as much if not more contradicted than supported by the lessons that they themselves draw from the work in business history that they adduce.

In terms of economic theory, LRT argue that economists have constructed new models of economic activity that are relevant to what goes on inside business enterprises. Of particular importance to business historians are “principal-agent” models that seek to understand the problems that decision makers (“principals”) face in securing productive performance from subordinates (“agents”) within the modern business enterprise. The key concept in the new theory is the condition of “asymmetric information” – a situation in which agents possess information that is relevant to productive performance but that is lacking to principals when they make economic decisions. Given that principals must rely on agents to inform and implement their decisions, asymmetric information can give rise to both cognitive problems of “adverse selection” (or “hidden information”), because principals are hampered by bounded rationality in choosing agents on whom to rely, and behavioral problems of “moral hazard” (or “hidden action”) because agents, once chosen, can use the condition of asymmetric information to act opportunistically in the ways in which they perform services for the principal.⁵⁴

For LRT, the introduction of the concepts of agency and asymmetry into economic models means that “business historians can turn to economic theory both for useful ideas and for the light a coherent perspective sheds on an otherwise untidy past. . . . The real benefit of recent theoretical developments in economics is that they enable business historians to recognize the essential unity that underlies a great number of the problems with which they are concerned.”⁵⁵

Indeed, LRT make the broad claim that the body of work of business historians that they have brought together in the three NBER volumes shows the role of “imperfect information” in the problems that firms face in their internal operations and in dealing with their external environments. Note that “asymmetric information” and “imperfect information,” although often used interchangeably by LRT, should not be viewed as

⁵⁴ For a critical evaluation of the Williamsonian transaction-cost model, which, focusing on bounded rationality and opportunism as determinants of organizational form, represents a specific application of agency theory, see Lazonick, “Theory of Innovative Enterprise.”

⁵⁵ Lamoreaux et al., “New Economic Approaches,” 77.

synonymous. Asymmetric information simply means that different parties to a relation have access to different information, and does not in itself imply superior or inferior economic performance. In contrast, imperfect information implies a comparison with the theoretical benchmark of the “perfect information ideal”; that is, the imperfect information inherent in asymmetric information is being compared with the economic performance that could be achieved under conditions of perfect information. Even if LRT and the new economic theorists whose insights they profess to propound do not believe the perfect information story for analyzing how the economy *actually* operates, they are still implicitly (and, for the theorists, in many economic models explicitly) evaluating economic performance in terms of perfect information – an ideal that in conventional economic theory is associated with the existence of “perfect markets.” That is, by asserting that asymmetric information is imperfect information, they in effect proclaim their ideological attachment to what I have elsewhere called the “myth of the market economy” – a perspective on resource allocation that systematically ignores the role of innovative business organization as a determinant of the wealth of nations.⁵⁶

Yet, notwithstanding their obeisance to conventional economic theory, if anything, the research of business historians that LRT have featured in their volumes contributes to, and emphasizes the need for, a theoretical perspective on the social conditions of innovative enterprise and a methodological approach to historical transformation. Indeed, in many of their own summaries of the historical contributions, LRT themselves inadvertently offer an interpretation of the findings that is more supportive of innovation theory than agency theory.

Innovation theory recognizes that different economic actors have differential access to information; the existence and evolution of a specialized division of labor within the enterprise are inherent in the industrial, organizational, and institutional complexity of the innovation process. Innovation theory also recognizes the potential validity of the basic insights of agency theory: that individuals can and do use their privileged access to information opportunistically as a means of promoting their own interests or that a lack of complete information on the part of those making allocative decisions complicates the decision-making process. Lacking a historical-transformation methodology, however, agency theory

⁵⁶ Lazonick, *Business Organization*, and, for a recent restatement of this position, id., “The Theory of the Market Economy and the Social Foundations of Innovative Enterprise,” *Economic and Industrial Democracy* (forthcoming).

cannot comprehend the problems and possibilities of the innovation process; that is, agency theory has no way of incorporating the basic insights of innovation theory into its analysis. In focusing on the problematic relations between principals and agents as individual economic actors, agency theory does not ask how principals might transform the conditions that give rise to adverse selection and moral hazard.

Innovation theory, therefore, can comprehend the constrained-optimization problems of agency theory but asks how, cognitively and behaviorally, the enterprise as a collectivity overcomes these problems through a transformation of the enterprise's knowledge base. Innovation theory also recognizes that in the transformation of the enterprise's knowledge base, the new distribution of expertise among participants in the enterprise's division of labor may create new possibilities for opportunistic behavior on the part of agents or new problems of bounded rationality on the part of principals. But in contrast to the approach of agency theory, the ongoing problematic for the innovative enterprise is not to optimize subject to these conditions of information asymmetry but rather to transform the differential access to information – that is, the specialized division of labor – into a cumulative and collective learning process.

In the theory of innovative enterprise, the structure of *strategic control* within the enterprise is key to understanding the combination of financial commitment and organizational integration that enables such organizational learning to occur. The theory of innovative enterprise focuses on *how the structure of strategic control mobilizes the collective power of the skills and efforts of participants in the enterprise's specialized division of labor to transform technological and market conditions*. If one accepts that, as a field of study, business history has as its central concern such historical transformations – and, in particular, finding out why the innovation process succeeds in some times, places, and activities but not in others – then business history needs a theory of innovative enterprise and a historical-transformation methodology. Armed with such analytical tools, the business historian can then, among other things, question economists' a priori assumptions concerning who are the principals and who are the agents, or indeed, whether a division of labor between participants in the enterprise into principals and agents is useful for analyzing the issues at hand.

The intellectual problem is not one of scarce information. Over the past few decades, our useful knowledge of business history has grown by leaps and bounds – as is indeed demonstrated by much of the historical

work in LRT's edited volumes. An understanding of the process of economic development, and the role of the business enterprise in it will require an intellectual revolution in economics – a transformation, so to speak, of the market to which economists sell their findings and the technologies that they use to obtain results. My hope is that the development of the SCIE perspective and the historical-transformation methodology that is needed to implement it can contribute to the achievement of these ends.

KEY WORKS

- Chandler, Alfred D, Jr. "Organizational Capabilities and the Economic History of the Industrial Enterprise." *Journal of Economic Perspectives* 6, no. 3 (1992): 79–100.
- Scale and Scope: The Dynamics of Industrial Capitalism*. Cambridge, Mass., 1990.
- The Visible Hand: The Managerial Revolution in American Business*. Cambridge, Mass., 1977.
- Lanoreaux, Naomi R., Daniel M. G. Raff, and Peter Temin. "New Economic Approaches to the Study of Business History." *Business and Economic History* 26, no. 1 (1997): 57–79.
- Langlois, Richard N. and Paul Robertson, eds. *Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions*. London, 1995.
- Lazonick, William. *Business Organization and the Myth of the Market Economy*. New York, 1991.
- "The Theory of Innovative Enterprise." In *The International Encyclopedia of Business and Management Handbook of Economics*, edited by William Lazonick, 638–59. London, 2002.
- Lazonick, William and Mary O'Sullivan. "Big Business and Skill Formation in the Wealthiest Nations: The Organizational Revolution in the Twentieth Century." In *Big Business and the Wealth of Nations*, edited by Alfred D. Chandler, Jr., Franco Amatori, and Takashi Hikino, 497–521. New York, 1997.
- "Finance and Industrial Development, Parts I and 2." *Financial History Review* 4, nos. 1 and 2 (1997): 7–39, 113–51.
- Marshall, Alfred. *Principles of Economics*, 9th edition. London, 1961.
- O'Sullivan, Mary. *Contests for Corporate Control: Corporate Governance and Economic Performance in the United States and Germany*. Oxford, 2000.
- Penrose, Edith. "The Growth of the Firm – A Case Study: The Hercules Powder Company." *Business History Review* 34, no. 1 (1960): 1–23.
- "History, the Social Sciences and Economic 'Theory', with Special Reference to Multinational Enterprise." In *Historical Studies in International Corporate Business*, edited by Alice Teichova, Maurice Lévy-Leboyer, and Helga Nussbaum, 7–13. Cambridge, 1989.
- The Theory of the Growth of the Firm*, 3d edition. Oxford, 1995.