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The Theory of Innovative Enterprise: A Foundation of Economic Analysis

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1. The Schumpeterian Challenge

In The Theory of Economic Development, first published in 1911, Joseph Schumpeter, drawing inspiration from Karl Marx, argued that capitalism had to be conceptualized as an economic system in which technological change, or more broadly speaking innovation, constantly disrupted the general equilibrium of market exchange (see Lazonick 2011a). As Schumpeter (1950, 106) would put in his 1942 book, Capitalism, Social and Democracy:

> 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, the strategy that looks so restrictive when viewed in the individual case and from the individual point in 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.

Yet a century after the publication of The Theory of Economic Development and over seventy years since the appearance of Capitalism Socialism, and Democracy, the mainstream of the economics profession still ignores the role of *the innovative enterprise* in the operation of the economy, and sets up perfect competition as the model of ideal efficiency.[1] To make the case, neoclassical economists have since the publication of Joan Robinson's The Theory of Imperfect Competition (1933) put forth the monopoly model as the demonstration of the inefficiency that occurs when perfect competition does not hold. Under monopoly, according to the neoclassical model, product prices are higher and output lower than under the perfectly competitive ideal.

For decades now, the neoclassical theory of monopoly has been touted as proof of perfect competition as, to use Schumpeter's words, "a model of ideal efficiency" while apparently incorporating into neoclassical theory an obvious characteristic of twentieth-century capitalism: the existence of "big business" in the economy. Yet, as I will show in this essay, the neoclassical theory of monopoly commits a fundamental error of logic by positing that the monopolist optimizes subject to the same cost structure as perfectly competitive firms. In committing this logical error, neoclassical economists have ignored not only Schumpeter but also the empirical and theoretical observations of Alfred Marshall (1961), whose Principles of Economics focused on the growth of the firm relative to the growth of its industry (Lazonick 1991, ch. 5); the pioneering work of Edith Penrose (1959) on "the theory of the growth of the firm" (Lazonick 2002); and the historical synthesis of Alfred Chandler (1962; 1977; 1990; 2001 and 2005) on the growth of the industrial corporation and its implications for the operation and performance of the economy (Lazonick 2010b; Lazonick 2012a). Building on these intellectual contributions, the theory of innovative enterprise shows how by transforming its cost

[1] Endogenous growth theory (for example, Grossman and Helpman 1994; Romer 1994; Aghion and Howitt 1998 and 2009) inserts the concept of "innovation" into macroeconomic models of the economy but lacks a theory of innovative enterprise, and perceives innovation as an element of "imperfect competition." It will require a separate paper to critique this approach to innovation. For critical comments on endogenous growth theory's adherence to the notion of "imperfect competition", see Moudud 2010, ch. 3 and 2012.

structure a firm can grow large while, in sharp contrast to the monopoly model, enhancing the efficiency of the economy.

Superior economic performance depends on innovative enterprise: the development and utilization of productive resources to generate higher quality, lower cost goods and services. Government policies to support the achievement of superior economic performance must be based on a theory of how an innovative enterprise evolves, operates and performs. In this paper I outline a theory of innovative enterprise in which social conditions summarized as *strategic control*, *organizational integration*, and *financial commitment* are central to the development and utilization of productive resources. The need for these social conditions derives from the uncertain, collective and cumulative character of the innovation process (Lazonick and O'Sullivan 1998; O'Sullivan 2000).

From the perspective of innovative enterprise, I critique alternative theories of the firm and their general policy implications. The neoclassical theory of the market economy that has long underpinned government economic policy in the advanced economies lacks a theory of innovative enterprise. Instead it posits the "optimizing firm" as the relevant microeconomic unit of analysis, and calls for the breakup of large-scale business enterprises so that large numbers of small-scale optimizing firms can move economic activity closer to the purported "ideal" of "perfect" competition (see Lazonick 2011b). Under the sway of the theory of perfect competition, the theoretical case for government policy that can influence business behavior and performance has long focused on the monopoly model in which large-scale business enterprises prevent the achievement of superior economic performance by producing lower output at higher prices than would be the case under conditions of perfect competition.

The basic empirical problem with the neoclassical monopoly model is the fact that in many industries that are central to the operation and performance of the economy, a small number of innovative firms can grow to be very large by generating more industry output at lower product prices than would have been the case if the industry had been populated by large numbers of near-identical competitors. This critique is not new. Economists such as Alfred Marshall, Joseph Schumpeter, and Edith Penrose understood the inferiority of so-called "perfect competition" as a benchmark of economic performance. Central to the growth and performance of advanced economies in the twentieth century was, as the business historian, Alfred Chandler, put it, "the visible hand" of managerial coordination.

Within the economics profession, the most widely touted alternative to the neoclassical monopoly model as an explanation of departures from perfect competition has come from transaction-cost economics. Oliver Williamson (1985), the foremost proponent of transaction-cost theory, has argued that the existence in a "market economy" of "hierarchies" – i.e., distinctive business enterprises of the type that Chandler and others have documented – derives directly from asset specificities that are given to the firm and not subject to change (for an extended critique see Lazonick 1991, chs. 6 and 7). The intended implication is that public policy must live with these immutable "market imperfections" rather than invoke the neoclassical "monopoly model" as the rationale for the pursuit of the perfectly competitive ideal.

Through the elaboration of the theory of innovative enterprise, I show both the illogic of the neoclassical monopoly model as proof of the superiority of "perfect" competition and the irrelevance of the Williamsonian transaction-cost model for understanding the growth and performance of the firm. The neoclassical monopoly model is illogical because it assumes that the monopolist optimizes subject to the same cost structures as perfect competitors. The Williamsonian transaction-cost model is irrelevant because "asset specificity" is not given to the firm but is rather an outcome of its investment strategy. The challenge is to explain the conditions under which this investment strategy results in innovative outcomes: higher quality, lower cost products than had previously been available. In the conclusion of this paper, I draw out the methodological, ideological, and institutional implications of the theory of innovative enterprise.

In the next section of this essay, I outline the theory of innovative enterprise, and show how it provides a framework for explaining the growth and performance of the firm. The theory of innovative enterprise demonstrates clearly why the neoclassical model of perfect competition is just the opposite of an ideal model of economic efficiency. From the perspective of the theory of the innovating firm that makes investments to transform technologies and access markets that can potentially give it a competitive advantage the neoclassical theory of the optimizing firm in perfect competition is a theory of the *un-innovating* firm; it takes technologies and markets as given constraints, and as a result cannot differentiate itself from its equally "perfect" competitors.

By the same token, as I go on to show, the theory of innovative enterprise exposes the illogic of the neoclassical monopoly model that is supposed to provide the proof of the superiority of perfect competition. An alternative approach to understanding "the nature of the firm" (as Ronald Coase put it in a famous 1937 article) is transaction-cost theory which, in the hands of Oliver Williamson (1975), was originally put forward as a critique of the neoclassical model and the "structure-conduct-performance" paradigm of industrial organization that this model engendered in the post-World War II decades. Williamson sought to establish how what he called "human nature as we know it", captured in the concepts of "bounded rationality" and "opportunism", can explain the very existence of firms in a market economy. In fact, he ultimately had to introduce as a *deus ex machina* a technological factor, "asset specificity", into his transaction-cost perspective to arrive at such an explanation. I show how, through its investment strategy and organizational structure, the innovating firm can *transform* asset specificity, bounded rationality, and opportunism rather than take these conditions as given constraints on its activities.

I conclude this essay by drawing out the methodological, ideological, and political implications of the theory of innovative enterprise. Methodologically, the theory of innovative enterprise calls upon economists to *integrate theory and history* so that, at any point in time, theory becomes both a conceptual distillation of what we know and a guide to researching what we need to know. The theory of innovative enterprise rejects constrained optimization as a methodology for analyzing the operation and performance of a modern economy. Ideologically, the theory of innovative enterprise calls for an understanding of the economy as a collective, cumulative, and uncertain process in which *markets are outcomes rather causes of economic development*. While in no way rejecting the importance of markets in providing opportunities for individual choice, the theory of innovative enterprise rejects the ideology that individual choice exercised through

markets drives economic development. Politically, the theory of innovative enterprise provides a framework for structuring governance, employment, and investment institutions to support the social conditions of innovative enterprise – strategic control, organizational integration, and financial commitment – and to regulate markets in products, labor, and capital so that the operation of business enterprises contributes to equitable and stable economic growth.

2. The Theory of Innovative Enterprise

A business enterprise seeks to transform productive resources into goods and services that can be sold to generate revenues. A theory of the firm, therefore, must, at a minimum, provide explanations for how this productive transformation occurs and how revenues are obtained. These explanations must focus on three generic activities in which the business enterprise engages: strategy, organization, and finance. *Strategy* allocates resources to investments in developing human and physical capabilities that, it is hoped, will enable the firm to compete for chosen product markets. *Organization* transforms technologies and accesses markets, and thereby develops and utilizes the value-creating capabilities of these resources to generate products that buyers want at prices that they are willing to pay. *Finance* sustains the process of developing technologies and accessing markets from the time at which investments in productive resources are made to the time at which financial returns are generated through the sale of products.

I identify three "social conditions of innovative enterprise" related to strategy, organization, and finance that enable a business to generate higher quality products at lower unit costs than those that had previously been available. These social conditions, summarized as strategic control, organizational integration, and financial commitment, can enable the firm to confront the uncertain, collective, and cumulative characteristics of the innovation process.

- Innovation is uncertain because when investments in transforming technologies and accessing markets are made the financial returns cannot be known, even probabilistically. As we shall see, "optimization" is the enemy of innovation. Hence the need for strategy.
- Innovation is collective because, to generate higher quality, lower cost products than were previously available, the business enterprise must integrate the skills and efforts of large numbers of people with different hierarchical responsibilities and functional capabilities into the organizational learning processes that are the essence of innovation. Hence the need for organization.
- Innovation is cumulative because collective learning today provides the foundation for collective learning tomorrow, and these organizational learning processes must be sustained over time until, through the sale of higher quality, lower cost products, financial returns can in fact be generated. Hence the need for finance.

Innovation requires the strategic allocation of resources to developing and utilizing productive resources. The social condition that can transform strategy into innovation is *strategic control*: a set of relations that gives decision-makers the power to allocate the firm's resources to confront the technological, market, and competitive uncertainties that are inherent in the innovation process. For innovation to occur, those who occupy

strategic decision-making positions must have both the *abilities* and *incentives* to allocate resources to innovative investment strategies. Their abilities to do so will depend on their knowledge of how the current innovative capabilities of the organization over which they exercise allocative control can be enhanced by strategic investments in new, typically complementary, capabilities. Their incentives to do so will depend on the alignment of their personal interests with the interests of the business organization over which they preside in attaining and sustaining its competitive advantage.

The implementation of an innovative strategy requires organization. The social condition that can transform organization into innovation is *organizational integration*: a set of relations that creates incentives for people with different hierarchical responsibilities and functional capabilities to apply their skills and efforts to strategic objectives. The need for organizational integration derives from the developmental complexity of the innovation process – that is, the need for organizational learning – combined with the imperative to secure high levels of utilization of innovative investments if the high fixed costs of these developmental investments are to be transformed into low unit costs. Modes of compensation in the forms of work satisfaction, promotion, remuneration, and benefits are important instruments for integrating individuals into the organization. To generate innovation, however, a mode of compensation cannot simply manage the labor market by attracting and retaining employees. It must also be part of a reward system that manages the learning processes that are the essence of innovation; the compensation system must motivate employees as individuals to engage in collective learning.

This collective learning, moreover, cumulates over time, thus necessitating the sustained commitment of financial resources to keep the learning organization intact. The social condition that can transform finance into innovation is *financial commitment*: a set of relations that ensures the allocation of funds to sustain the cumulative innovation process until it generates financial returns. What is often called "patient" capital enables the capabilities that derive from collective learning to cumulate over time, notwithstanding the inherent uncertainty that the innovation process entails. Strategic control over internal revenues is a critical form of financial commitment, but such "inside capital" must often be supplemented by external sources of finance such as stock issues, bond issues, or bank debt that, in different times and places, may be more or less committed to sustaining the innovation process.

The "social conditions of innovative enterprise" perspective asks how and under what conditions the exercise of strategic control ensures that the enterprise seeks to grow using the collective processes and along the cumulative paths that are the foundations of its distinctive competitive success.[2] Of central importance to the accumulation and transformation of capabilities in knowledge-intensive industries is the *skill base* in which the firm invests in pursuing its innovative strategy.

At any point in time a firm's functional and hierarchical division of labor defines its skill base (Lazonick 1998, 2004, and 2010a). In the effort to generate collective and

[2] See Lazonick 2002 for the relation between the "social conditions" perspective, and the "dynamic capabilities" approach of Teece et al. 1997. See Teece (2009 and 2010) for the subsequent development of the dynamic capabilities perspective.

cumulative learning, those who exercise strategic control can choose how to structure the skill base, including what types of employees (e.g., white-collar versus blue-collar) are integrated into the organizational learning processes and how employees move around and up the enterprise's functional and hierarchical division of labor over the course of their careers. At the same time, however, the organization of the skill base will be constrained by both the particular learning requirements of the industrial activities in which the firm has chosen to compete and the alternative employment opportunities of the personnel whom the firm wants to employ. The innovative enterprise requires that those who exercise strategic control be able to recognize the competitive strengths and weaknesses of their firm's existing skill base and, hence, the changes in that skill base that will be necessary for an innovative response to technological opportunities and competitive challenges. These strategic decision-makers must also be able to mobilize committed finance to sustain investment in the skill base until it can generate higher quality, lower cost products than were previously available.

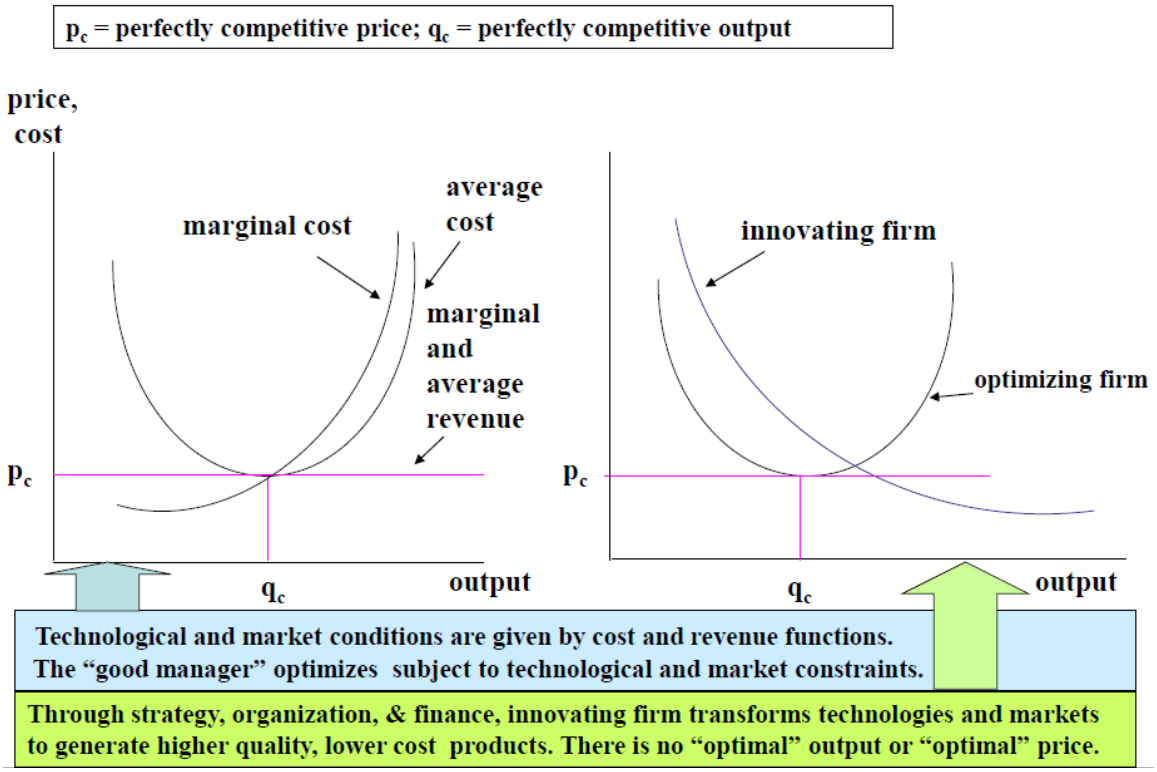
The neoclassical theory of the firm, found in any microeconomics textbook (see the left-hand side of Figure 1), trivializes the content of strategy, organization, and finance. The rule of profit maximization, imposed on the firm by given technological and market constraints, determines the firm's strategy about the industry in which the firm should compete and the quantity of output that the firm should produce. The appearance of supernormal profits in a particular industry as a result of exogenous changes in technology and markets induces "entrepreneurs" to allocate resources to produce in that industry. Having invested in an industry, the management of the firm reduces to an exercise in "substitution at the margin" in the choice of its profit-maximizing output. It is indeed, as we shall see, a *loss of control* over the internal organization of production that is essential for this "optimal" outcome. Financing the transformation of productive resources into revenue-generating products is non-problematic because the theory assumes that at each and every point in time the firm can borrow capital at the prevailing market rate and can sell all of the output that maximizes its profits, covering the cost of capital.

While the neoclassical theory of the firm trivializes the problems of strategy, organization, and finance, the particular formulation of the theory by post-Marshallian economists from the 1920s on embodied a number of realistic assumptions about the factors that could influence the relation between the costs of production and the amount of output produced. These realistic assumptions have made the theory credible as a depiction of the way in which an actual firm operates. Analytically, these assumptions have provided the basis for a reasoned account of why the firm might have a U-shaped cost curve that, through the profit-maximization rule, enables it to choose an optimal level of output. The problem is, however, that the *optimizing* firm is not an *innovating* firm; indeed it can be characterized as an *un-innovating* firm.

In terms of strategy, the theory of the optimizing firm posits that an "entrepreneur" chooses the industry in which he wants to compete by allocating resources to any industry in which, because of the exogenous appearance of a disequilibrium condition, there are supernormal profits to be made. The disequilibrium condition disappears as entrepreneurs reallocate resources to this particular industry, and, as long as equilibrium

conditions persist across all industries, there will be no incentive for the entrepreneur to shift resources from one industry to another.

Figure 1. Comparing the optimizing and innovating firm



There are two assumptions embodied in the neoclassical theory of the firm that limit its ability to understand innovative enterprise. First, the neoclassical theory assumes that *the entrepreneur plays no role in creating the disequilibrium condition* that triggers the reallocation of resources from one industry to another. In the theory of the innovating firm, by contrast, entrepreneurs create new profitable opportunities, and thereby disrupt equilibrium conditions. Second, the neoclassical theory assumes that *the entrepreneur requires no special expertise to compete in one industry rather than another*. All that is required of the entrepreneur is that he follow the principle of profit maximization in the choice of industry in which to compete. In the theory of the innovating firm, in contrast, the entrepreneur's specialized knowledge of the industry in which he chooses to compete is of utmost importance for his firm's ability to be innovative in that industry.

The entrepreneurial disruption of the "circular flow" was Schumpeter's basic contribution to the theory of the innovating firm. In The Theory of Economic Development (1934), Schumpeter drew the sharp distinction between neoclassical general equilibrium – that is, "The Circular Flow of Economic Life as Conditioned by Given Circumstances," the title of chapter one – and entrepreneurial innovation – "The Fundamental Phenomenon of Economic Development", the title of chapter two. Over the course of his career, Schumpeter recognized that the entrepreneurial function that initiates the innovation process could be a collective rather than individual endeavor (see Lazonick 1994).

In sharp contrast to the Schumpeterian perspective but in a manner consistent with *neoclassical* theory, Austrians such as Israel Kirzner (1997) define the entrepreneur as one of the first to notice the appearance of disequilibrium conditions somewhere in the economic system. Hence he is among the first to reallocate resources from one use to another to take advantage of the existence of supernormal profits during the fleeting period during which these supernormal profits exist. His reallocation of resources to capture these supernormal profits begins the process of reducing them to normal levels, thus re-establishing equilibrium conditions. But the Austrians make no attempt to explain why disequilibrium conditions appear in the first place. Their "entrepreneur" is in effect an arbitrageur, who has little in common with the Schumpeterian entrepreneur whose actions *create* disequilibrium conditions, and who, as Schumpeter (1965) recognized, could have motives other than profits and could even be a representative of the state.

Once the industry has been chosen, the neoclassical theory assumes that there are certain fixed costs, exogenously determined by existing technology and prevailing factor prices, that must be incurred by each and every firm that chooses to compete in the industry. These fixed costs are typically attributed to lumpy investments in plant and equipment, although it is also sometimes recognized that the entrepreneur's salary represents an element of fixed costs. These costs are fixed because they are incurred even if the firm produces no output. As the firm expands its output, the average cost curve slopes downward as fixed costs are spread over a larger volume of output. The limiting assumption here is that *the entrepreneur does not choose the firm's level of fixed costs and the particular productive capabilities embodied in them as part of his firm's investment strategy*. In the theory of the innovating firm, the level of fixed costs manifests strategic decisions to make investments that are intended to endow the firm with distinctive productive capabilities compared with its competitors in the industry (see the right-hand side of Figure 1).

Given the firm's fixed costs, the entrepreneur purchases that quantity of complementary variable inputs at prevailing factor prices in accordance with the technological requirements of the amount of output at which profits are maximized. Thus variable costs per unit of output are added to the fixed costs per unit of output to yield total unit costs, with the average cost curve mapping these total unit costs for different levels of output. If variable costs were to remain constant as output expands, the average cost curve would slope downwards continuously (although at a declining rate) as fixed costs are spread over more units of output.

At this point, however, the neoclassical theory makes a critical assumption that causes the average cost curve to change direction and slope upwards, thus yielding the well-known U-shaped cost curve. The assumption is that the addition of variable factors of production to the firm's fixed factors of production results in a declining average productivity of these combined factors (that is, the firm's technology, which is also the industry's technology).

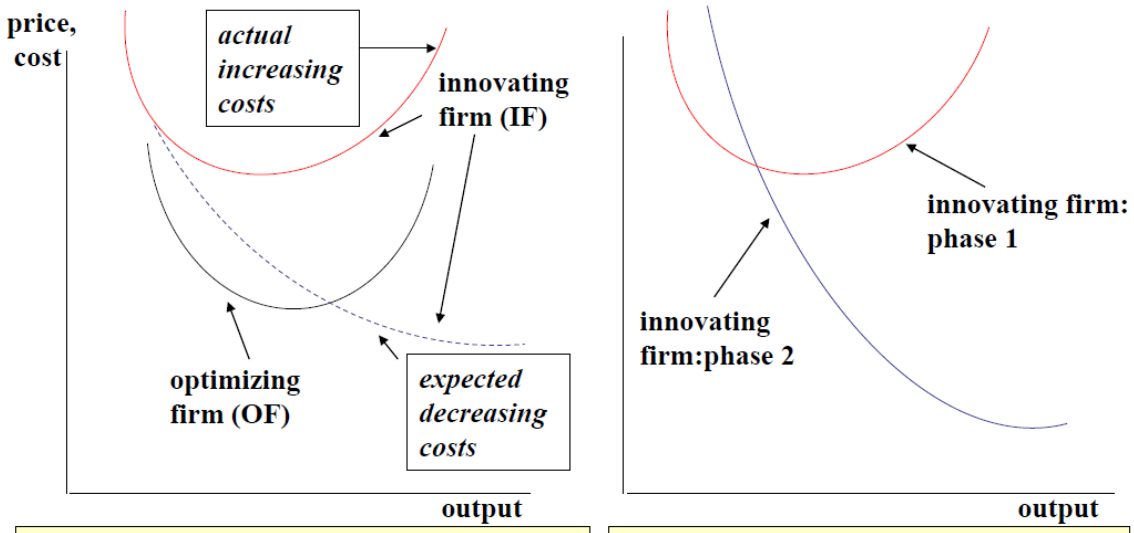
In deriving the U-shaped cost curve, neoclassical theorists have put forward two quite plausible reasons why productivity declines as output expands. Both reasons assume that the key variable factor is labor. One reason is that as more variable factors are added to the fixed factors, increasingly crowded factory conditions reduce the productivity of each

variable factor as, for example, workers continuously bump into one other. The other reason is that as more workers are added to the production process, the entrepreneur, as the fixed factor whose role it is to organize productive activities, experiences a "control loss" because of the increasing number of workers that he has to supervise and monitor.

Hence organization – in this case the relation between the entrepreneur as manager and the work force that he employs – becomes central to the neoclassical theory of the firm, and places a limit on the growth of the firm. In making this optimizing firm the foundation for perfect competition, neoclassical economists simply assume that increasing costs set in at very low levels of output so that the firm is very small relative to the size of the industry, and hence its output decision does not affect the price at which it can sell its product. Why increasing costs should afflict firms at such low levels of output is not explained.[3] This assumption is, however, essential for neoclassical economists to posit the possibility of perfect competition.

Within the theory of the optimizing firm, the constraining assumption is that *the entrepreneur passively accepts this condition of increasing costs, and optimizes subject to it as a constraint*. In sharp contrast, in the theory of the innovating firm, the experience of increasing costs, as shown on the left-hand side of Figure 2, provides the firm's strategic decision-makers with an understanding of *the limits of the initial investment strategy*, and with that information they make additional new investments for the strategic purpose of *taking control* of the variable factor that was the source of increasing costs (for an elaboration of this argument, see Lazonick 1991, ch. 3, and 1993).

Figure 2. Innovative strategy and the reshaping of the cost curve



[3] I am grateful to Jamee Moudud for raising this point.

An innovating firm would not take a condition of overcrowding or control loss that results in increasing costs as a "given constraint", but rather would make investments in technology and organization to change that condition. In effect, for the sake of improving its capability to develop and utilize productive resources, the innovating firm makes *strategic* investments that transform variable costs into fixed costs, which the firm, in order to innovate successfully, must now endeavor to transform into low unit costs.

What is the role of finance in the theory of the optimizing firm? A firm needs to finance fixed-cost investments because, by definition, the returns from these investments are generated over time. The theory of the optimizing firm posits that, at any given point in time, the firm can sell all the output that it wants according to a known industry demand schedule. Hence, in theory, there are no risks entailed in the financing of investments over the period of time that it takes to amortize the investments. The cost of capital is built into the firm's cost structure, and simply reflects the market price of finance.

Neoclassical theorists have recognized the adjustment problem that faces an industry when there is a reduction in demand. With market prices depressed, some firms should exit the industry. But given the assumption that all firms in the industry have identical cost structures, it is not clear why some firms would drop out of the industry, leaving the remaining firms to enjoy the restoration of "normal" profits. Rather all firms in the industry, viewing their fixed costs as *sunk* costs, would continue to produce at the profit-maximizing level as long as the market price at least enables them to cover their variable costs. Under such conditions of "cut-throat competition", firms in effect live off their existing investments while they lack the prospective returns to justify the financing of new investments (see Reynolds 1940 for a classic article).

In contrast, in the theory of the innovating firm, the uncertainty inherent in fixed costs is central to the analysis rather than being a by-product of *ad hoc* concessions to reality. The theory of the innovating firm assumes that the investments that the firm makes must be developed and utilized over time, as the firm transforms technologies and accesses markets, before returns from those investments can be generated, or indeed before the rate of return can even be known. The problem is not, as in the theory of the optimizing firm, whether the prevailing return on investment provided by existing technological and market conditions will continue in the future. Since the return on investment depends on the extent of the market that the innovating firm ultimately attains, and since that extent of the market is inherently uncertain, a return on investment *does not even prevail in the present*; that is, at the time when the investments in innovation are made.

Investments in innovation must be made despite the existence of uncertainties concerning prospective returns. The distinguishing characteristics of a particular industry derive from its particular technologies, markets, and competitors. As a result, any strategic manager who allocates resources to an innovative strategy faces technological, market, and competitive uncertainties concerning the eventual success of the strategy.

Technological uncertainty exists because the firm may be incapable of developing the higher quality processes and products envisaged in its innovative investment strategy; if one already knew how to generate a new product or process at the outset of the investment, it would not be innovation.

Market uncertainty exists because, even if the firm is successful in its development effort, future reductions in product prices and increases in factor prices may lower the returns that can be generated by the investments. Moreover, the innovative enterprise must access a large enough extent of the product market to transform the fixed costs of developing a new technology into low unit costs. Like transforming technology, accessing the market is an integral part of the innovation process, and, at the time when resources are committed to an innovative strategy, it is impossible to be certain, even probabilistically, about the extent of the market that will be accessed.

Finally, even if a firm can overcome technological and market uncertainty, it still faces competitive uncertainty: the possibility that a competitor will have invested in a strategy that generates an even higher quality, lower cost product. Nevertheless, if a firm is to have the opportunity to profit and grow through innovation, it must invest in the face of uncertainty.

The optimizing firm may calculate, on the basis of prior experience, the risk of a deterioration of current market conditions, but it has no way of contemplating, let alone calculating, the uncertainty of returns for conditions of supply and demand that, because innovation is involved, have yet to be created. The fact, moreover, that the optimizing firm will only finance investments for which an adequate return already exists creates an opportunity for the innovating firm to make innovative investments that, if successful, can enable it to outcompete optimizing firms. Indeed, in the future optimizing firms may find that the cause of the "poor market conditions" that they face is not the result of an exogenous shift in the industry demand curve but rather the result of competition from innovating firms that have gained competitive advantage while their own managers happily optimized (as indeed the economics textbooks instructed them to do) subject to given technological and market constraints.

The task for a theory of innovative enterprise, therefore, is to explain how, by generating output that is higher quality and/or lower cost, a particular enterprise can differentiate itself from its competitors and emerge as dominant in its industry. Unlike the optimizing firm, the innovating firm does not take as given the fixed costs of participating in an industry. Rather the amount of fixed costs that it incurs reflects its innovative strategy. Neither indivisible technology nor the "entrepreneur" as a fixed factor (typical assumptions, as we have seen, in the neoclassical theory of the optimizing firm) dictates this "fixed-cost" strategy. An innovative strategy, with its fixed costs, results from the assessment by the firm's strategic decision-makers of the quality and quantity of productive resources in which the firm must invest to *develop* higher quality processes and products than those previously available or that may be developed by competitors. It is this development of productive resources internal to the enterprise that creates the *potential* for an enterprise that pursues an innovative strategy to gain a sustained advantage over its competitors and emerge as dominant in its industry.

The *development* of productive resources, when successful, becomes embodied in products, processes, and people with superior productive capabilities than those that had previously existed. But an innovative strategy that can eventually enable the firm to develop superior productive capabilities may place the innovating firm at a *competitive disadvantage* because such strategies tend to entail higher fixed costs than the fixed costs

incurred by rivals that choose to optimize subject to given constraints. As an essential part of the innovation proves, the innovating firm must access sufficient markets for its products to transform high fixed costs into low units costs, and, thereby, competitive disadvantage into comparative advantage.

These higher fixed costs derive from the *size* and *duration* of the innovative investment strategy. Innovative strategies will entail higher fixed costs than those incurred by the optimizing firm if the innovation process requires the *simultaneous development* of productive resources across a broader and deeper range of integrated activities than those 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 duration of time that is required to develop productive resources until they result in products that are sufficiently high quality and low 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 required for an organization of people to 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 firm 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 innovating firm 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 of the optimizing firm, take increasing costs as a given constraint, the innovating firm will attempt to transform its access to high-quality productive resources at high levels of output. To do so, it invests in the *development* of that productive resource, the *utilization* of which as a variable input has become a source of increasing costs (see Figure 2).

The development of the productive resource adds to the fixed costs of the innovative strategy. Previously this productive resource was utilized as a variable factor that could be purchased incrementally at the going factor price 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 innovating firm is then under even more pressure to expand its sold output in order to transform high fixed costs into low unit costs. As, through the development and utilization of productive resources, the innovating firm succeeds in this transformation, it in effect "unbends" the U-shaped cost curve that the optimizing firm takes as given (see Figure 2). By shaping the cost curve in this way, the innovating firm creates the possibility of securing competitive advantage over its "optimizing" rivals.

As indicated in Figures 3a and 3b, the dynamics of the innovation process depend on the evolution of not only product costs but also product demand. Indeed, the two are interdependent because the attainment of low unit costs depends on the extent of the market that the firm accesses, and the extent of the market that the firm is able to access depends on the productive capabilities that it develops. At a point in time there exists a *potential* demand for a good or service that is dependent on both the incomes and wants of buyers. The innovative firm, however, must *access* these markets, a process that

generally entails investments of considerable size and duration in sales forces, distribution and servicing facilities, advertising, and branding.

Figure 3a. Accessing market segments: product innovation

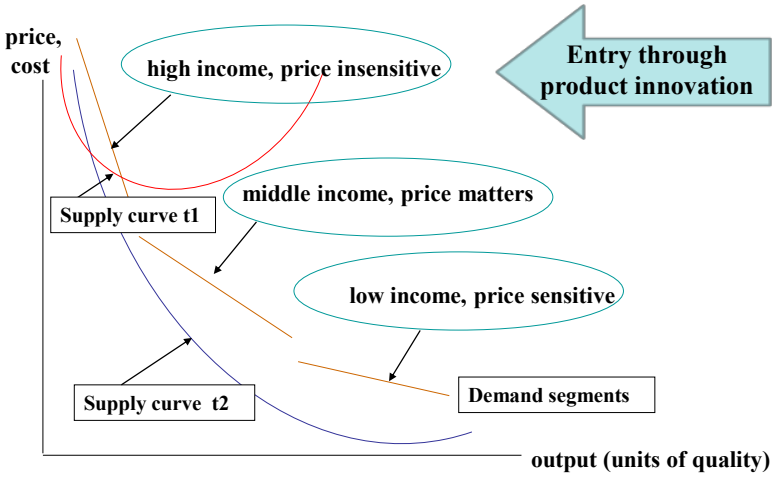
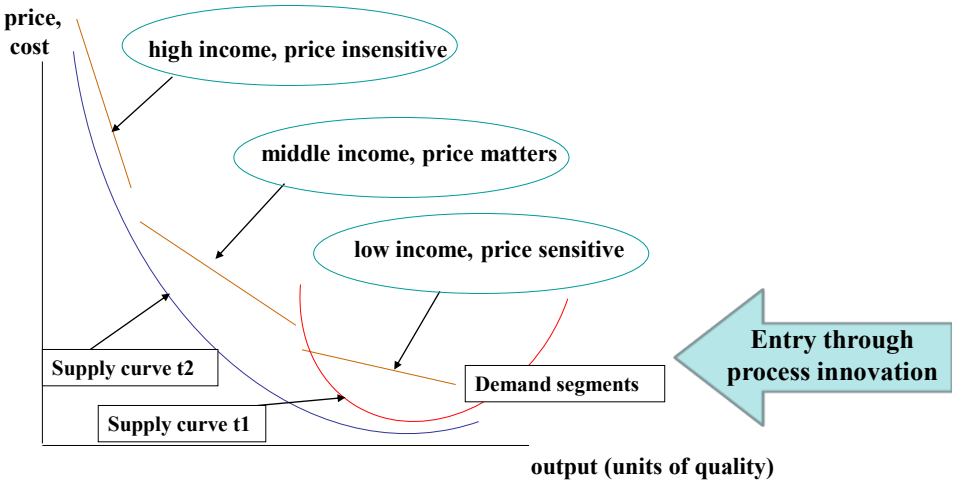


Figure 3b. Accessing market segments: process innovation



These investments, which add to the fixed costs of the innovative investment strategy, are necessary because of the need to inform and convince potential buyers that the product is in fact (given their wants) "higher quality" than alternative goods or services that could satisfy those wants. These investments in accessing markets can shape the demand curve for the firm's product by increasing the quantity of the product that buyers will demand at a given price. To some extent, this demand will become "dedicated" as buyers come to view the firm's product as higher quality relative to those of competitors; that is, buyers will be willing to pay a premium price for the firm's brand. Market investments can also shape the price elasticity of demand for the firm's product, as the buyers' perception of its higher quality makes them less willing than they would have otherwise been to reduce the quantity demanded in response to an increase in price.

The dynamics of the innovation process can enable the innovating firm to capture progressively a number of market segments based on different income levels of buyers (see Figures 3a and 3b). Especially at the initial stages of the innovation process, the innovating firm may not have sufficiently developed its capabilities to gain access to all of these market segments simultaneously. Cumulatively, however, the ability of the innovating firm to access one market segment may provide a foundation on which it can develop capabilities to access other market segments as it transforms its ability to produce a higher quality, lower cost product, as indicated by supply curves t1 and t2 in Figures 3a and 3b (which reflect the type of transformation shown on the right-hand side of Figure 2).

As a general rule, as shown in Figure 3a, the innovating firm will access high-income, price-insensitive markets through product innovation and then proceed from the higher income segments to the lower income segments as it improves its manufacturing capability and achieves economies of scale. Conversely, also a general rule, as shown in Figure 3b, the innovating firm that is incapable of product innovation can enter an industry by accessing lower-income, price-sensitive markets through process innovation, and then may seek to access higher income more price insensitive markets through a combination of improvements in both products and processes.

By meeting demand for an innovative product in the high-income market in the early stage of the innovation process, the firm generates revenues that help sustain the process, while, through the iterative investment process that I described earlier, the firm learns how to mass produce and mass market, thus gaining access to buyers who are lower income and, hence, more price sensitive. In gaining access to lower income segments, as depicted in Figure 3a, the firm may also engage in process innovation. But its competitive advantage will come from product innovation. Indeed, as it moves into the lowest income, or mass-market, segments, the innovating firm will have to decide whether to continue manufacturing this product now that it has become a commodity

The development of pocket calculators in the 1970s provides an example of this type of product innovation. In 1973 Texas Instruments and Hewlett-Packard launched expensive scientific pocket calculators for on-the-job use by engineers. By 1975 less costly versions were available for middle-income buyers such as college professors and students. By about 1977 pocket calculators with significant computing power had become almost commodities; one could often get one free when opening up a bank account. The

development of plasma television screens in the 2000s provides another well-known example of this type of progression, driven by product innovation, through the income segments.

Alternatively, an innovating firm may seek to capture existing mass markets through process innovation that, if it can attain a sufficient extent of the market, makes *existing* products lower cost. In this case, as illustrated in Figure 3b, the innovative strategy will target lower income markets in the first phase. In subsequent phases, however, the innovating firm will seek to move into higher income segments of the market that can afford higher quality products by adding new product features to the advantages it has already gained through process innovation.

Japanese progress in automobiles from the 1950s to the 1990s provides an excellent example of this movement from lower income to higher income markets, driven by process innovation. In the 1950s and 1960s Japanese car companies manufactured vehicles mainly for the home market, in which by global standards incomes were still relatively low. The oil crisis of 1973-1974, however, created an opportunity for Japanese companies such as Toyota and Nissan to sell fuel-efficient small cars to middle-income buyers in the US market. Initially, the Japanese cars were low quality, primarily because Japan was still producing primarily for Japanese markets in which average incomes were much lower than in the United States. But within a few years, through the application of process innovations such as statistical quality control that Japanese companies had been using since the 1950s, Japanese cars gained a reputation for high quality, while remaining affordable in middle-income markets. By the end of the 1980s, with cars such as Toyota's Lexus and Nissan's Infiniti, the Japanese were successful in challenging German carmakers such as BMW and Daimler Benz in the higher-end markets, while extending their advantage in process innovation. At that point the German car companies recognized that they had to learn process innovation from the Japanese.

The innovating firm generates revenues when, as a result of developing and utilizing productive resources, it can offer buyers a product of a quality that they want at a price that they are willing to pay. What then determines output and price in a theory of innovative enterprise? The answers are not straightforward because the innovating firm's pricing strategy and its investments designed to shape market demand are endogenous to the innovation process itself (see Spence 1981; Moudud 2010). The innovating firm will have a strong interest in increasing the extent of the market to which it has access. Greater market share not only lowers unit costs but also increases the learning experience of the innovating firm, while it helps to prevent rivals from gaining access to buyers not only at present but also in the future as buyers become customers who repeat their purchases of, and upgrade their demand for, the innovating firm's products (see Christensen 1997). For the innovating firm, output and price are variables that are determined by its competitive strategy – a strategy that entails transforming technologies and accessing markets as the firm strives to differentiate itself from its competitors.

Technological transformation and market access require not only strategy, but also organization and finance. The revenues (and not just the profits) that the innovating firm generates can be critical to sustaining its success. When the innovating firm generates

revenues, it has financial resources that can be allocated in a number of ways. If the gains from innovation are sufficient, the firm's revenues create the possibility for self-financing. The firm may leverage this financing with bonded and bank debt on favorable terms, depending on its relations with the financial sector and its need for finance. For the innovating firm, financial resources not only fund new investment but also enable the firm to keep its "learning" organization intact. The innovating firm can use the gains of innovative enterprise to reward its employees for their application of skill and effort to transforming technology and accessing markets.

It may be that, as a result of sharing the gains of innovative enterprise with its employees, the firm's wage bill is higher than those dictated by labor markets. Yet, depending on the extent of the changes in the supply and demand curves that result from the innovation process, its profits may be higher *because of* its higher wage bill. The gains of enterprise that the innovating firm has shared with its employees may have been critical inducements for gaining their cooperation in implementing its innovative investment strategy. In dynamic perspective, the innovating firm's high wages may be integral to its dynamic capabilities that generate competitive advantage.

The innovating firm becomes dominant, therefore, by transforming the industry cost structure, shaping market demand, and producing a larger volume of output that it can sell at lower prices than optimizing firms in the industry. By confronting and changing technological and market conditions rather than accepting them as constraints on its activities, the innovating firm, that is, can outperform the optimizing firm in terms of both output and cost. Unlike the optimizing firm, the innovating firm 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. The economies of scale are not given to the industry but reflect the innovating firm's ability to transform the high fixed costs of its innovative investment strategy into the low unit costs that give it competitive advantage.

Indeed, given the high fixed costs of its innovative investment strategy, if economies of scale are not attained the innovating firm will be at a competitive *disadvantage* relative to the optimizing firm. Yet when the innovative strategy is successful, the innovating firm has the potential of not only outperforming the optimizing firm in terms of product quantity and price but also generating sufficient surplus revenues to pay higher wages to employees and higher returns to other stakeholders such as suppliers, shareholders, and, through taxation, governments. The innovation process, that is, can potentially overcome the "constrained-optimization" trade-offs between consumption and production in the allocation of resources as well as between capital and labor, and even between enterprise and society, in the allocation of returns. It is for this reason that innovation can form the foundation for equitable and stable economic growth, or what I have called "sustainable prosperity" (Lazonick and O'Sullivan 2002; Lazonick 2009b).

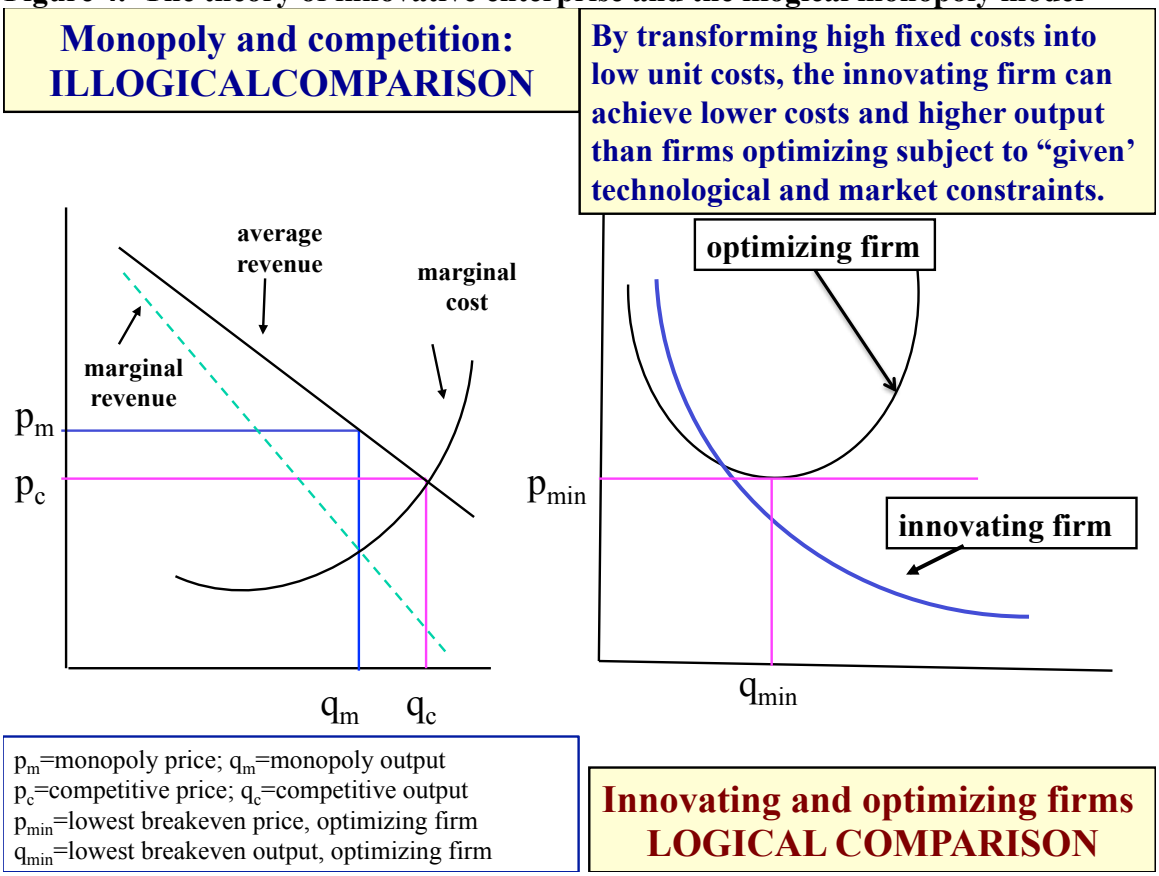
3. The Illogical Monopoly Model and the Transaction-Cost Alternative

In the first decades of the twentieth century, the reality of the rise of the innovative managerial enterprise confronted the theory of the optimizing firm. Neoclassical economists responded by depicting the "monopoly model" as the analytical basis for

assessing the performance of "big business". Indeed, in the post-World War II decades, the monopoly model became the theoretical foundation of the "structure-conduct-performance" school of industrial organization, a neoclassical perspective rooted in the "ideal" of perfect competition (see Weiss 1979). According to the monopoly model, a firm that dominates its industry will raise price and restrict output compared with price and output under perfectly competitive conditions (see the left-hand side of Figure 4).

The comparison of constrained optimization under conditions of perfect competition and monopoly contains, however, *a fundamental flaw* (see the right-hand side of Figure 4). The problem is not with the internal logic of the constrained optimization model per se, be it in its competitive or monopoly form. Rather *the problem is with the logic of comparing the competitive model with the monopoly model within the constrained-optimization framework*. If technological and market conditions make perfect competition a possibility, how can one firm (or even a small number of firms) come to dominate an industry?

Figure 4. The theory of innovative enterprise and the illogical monopoly model



One would have to assume that the monopolist somehow differentiated itself from other competitors in the industry. But, the constrained-optimization comparison shown on the left-hand side of Figure 4 that demonstrates the inferiority of monopoly argues that both the monopolist firm and perfectly competitive firms *optimize subject to the same cost*

structures that derive from given technological and factor-market conditions.[4] Indeed, except for the assumption that in one case the firm can make its profit-maximizing output decision as if it can sell all of its output at a constant price (according to a perfectly elastic demand curve) and that in the other case the firm is so large that it can only sell more output at a lower price (according to a downward sloping demand curve), there is absolutely nothing in terms of the structure or operation of the firm that distinguishes the perfect competitor from the monopolist! So how would monopoly ever emerge under such conditions?

The now-standard comparison of perfect competition and monopoly within the theory of the optimizing firm was elaborated by the followers of Alfred Marshall, building on Books V and VI of Principles of Economics, first published in 1890 and revised in eight editions up to 1920. Yet, in Principles of Economics, Marshall (1961, 484-5) himself recognized that a situation where one firm dominates an industry will not necessarily yield economic outcomes that are inferior to those that would prevail in an industrial structure based on perfectly competitive firms. As he put it explicitly (with my emphasis):

> The monopolist would lose all his monopoly revenue if he produced for sale an amount so great that its supply, as here defined, was equal to its demand price: the amount which gives the maximum monopoly revenue is always considerably less than that. *It may therefore appear as though the amount produced under a monopoly is always less and its price to the consumer always higher than if there were no monopoly. But this is not the case.* For when the production is all in the hands of one person or company, the total expenses involved are generally less than would have to be incurred if the same aggregate production were distributed among a multitude of comparatively small rival producers. They would have to struggle with one another for the attention of the consumers, and would necessarily spend in the aggregate a great deal more on advertising in all its various forms than a single firm would; and they would be less able to avail themselves of the many various economies which result from production on a large scale. In particular they could not afford to spend as much on improving methods of production and the machinery used in it, as a single large firm which knew that it was certain itself to reap the whole benefit of any advance it made. This argument does indeed assume the single firm to be managed with ability and enterprise, and to have an unlimited command of capital – an assumption which cannot always be fairly made. But where it can be made, *we may generally conclude that the supply schedule for the commodity, if not monopolized, would show higher supply prices than those of our monopoly supply schedule; and therefore the equilibrium amount of the commodity produced under free*

[4] The left-hand side of figure 4 compares output and price of monopoly and perfect competition along the same industry supply curve, demonstrating that comparatively monopoly lowers output and raises price. Of course, if perfect competition could actually exist in this industry, the entry of perfectly competitive firms would expand output and lower price even more until the industry equilibrium is reached with price at the lowest point of the average cost curve (as shown on the right-hand side of Figure 4). But the logic of the argument to demonstrate the inferiority of monopoly remains nonsensical; if one firm can dominate the industry, why would one assume that it has the same cost structure as would be the case if the industry were characterized by perfect competition?

> *competition would be less than that for which the demand price is equal to the monopoly supply price.* [5]

Of course, economists have long argued that *natural monopoly* characterizes some industries, as exemplified by electric utilities. Relative to the size of the market to be served, the fixed costs of setting up an enterprise in such an industry are so high that it is uneconomical to have more than one firm serving a particular market area. But, if that is the case, then the comparison of output and price under natural monopoly with the "optimal" levels of product price and product output under competitive conditions is irrelevant. If one opts for the "natural monopoly" explanation for the concentrated structure of an industry, one cannot then logically invoke the "perfect competition" comparison to demonstrate the inefficiency of monopoly.

Recognizing the irrelevance of the competitive alternative under certain technological and market conditions, governments have long regulated utilities by (in principle at least) setting output prices that can balance the demands of consumers for reliable and affordable products with the financial requirements of utility companies for developing and utilizing the productive resources that will enable the delivery of such products to consumers. The analysis of the conditions for evaluating such long-term projections concerning the evolving relation of supply of and demand for such products requires a theory of the innovating firm that can transform technological and market conditions, not a theory of the optimizing firm that takes these conditions as given constraints.

To draw conclusions concerning the relative economic performance of the optimizing firm of neoclassical theory, its output and price should be compared with those that can be achieved by an innovating firm that, as we have seen, transforms technological and/or market conditions to generate higher quality, lower cost products than had previously been available at prevailing factor prices (see Figure 1). As a general rule, the innovating firm has an interest in lowering prices in order to increase the extent of its market, thus driving down unit costs and expanding industry output.

The overall gains from innovation will depend on the relation between the innovating firm's cost structure and the industry's demand structure, while the distribution of those gains among the firm's various "stakeholders" will depend on their relative power to appropriate portions of these gains. What is important in the first instance is that, as a result of the transformation of technological and market "constraints", there are gains to innovative enterprise that can be shared. In expanding output and lowering cost, it is theoretically possible (although by no means inevitable) for innovative enterprise to result, simultaneously, in higher pay and better work conditions for employees, a stronger balance sheet for the firm, more secure paper for creditors, higher dividends and/or stock

[5] Marshall (1961, 485n) added in a footnote: "Something has already been said ([Book] IV, [Chapters] XI, XII; and [Book] V, [Chapters] XI), as to the advantages which a single powerful firm has over its smaller rivals in those industries in which the law of increasing return acts strongly; and as to the chance which it might have of obtaining a practical monopoly of its own branch of production, if it were managed for many generations together by people whose genius, enterprise and energy equalled those of the original founders of the business." It was the "managerial revolution" that is the essence of the "Chandlerian corporation" (Chandler 1977 and 1990) that overcame the constraint that the "many generations" of managers had to come from the same family, as Marshall assumed.

prices for shareholders, more tax revenues for governments, and higher quality products at lower prices for consumers.

The theory of innovative enterprise demonstrates the limitations of those critiques of the neoclassical monopoly model that, operating within a constrained optimization framework, fail to analyze how, through strategy, organization, and finance, the firm can transform technological and market conditions to generate higher quality, lower cost products. The most prominent constrained-optimization critique of the neoclassical monopoly model is that constructed by Oliver Williamson in the decade following the publication of his 1975 book, Markets and Hierarchies: Analysis and Antitrust Implications, culminating in The Economic Institutions of Capitalism, published in 1985.[6] The strength of Williamson's perspective is that it elaborates a theory of the firm based explicitly on realistic assumptions about the roles of technology, cognition, and behavior in economic activity. The weakness of his approach is that he takes these technological, cognitive, and behavioral conditions as given constraints on economic decision-making, and thus cannot address the question of how economic actors can transform these conditions to engage in innovation that can result in superior economic performance.

Williamson rejects the neoclassical monopoly model, and the structure-conduct-performance paradigm that was built on this model, because it does not explain why "hierarchy" replaces the "market" as an economic institution of capitalism. As such, his approach is an elaboration of the "transaction-cost" arguments of Ronald Coase (1937) on "the nature of the firm" (see Lazonick 1991, 168-171). 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 cognitive condition that, following Herbert Simon, he calls "bounded rationality" (Williamson 1985, 8, 45). Williamson's inclusion of these behavioral and cognitive conditions as central to the theory of the firm distinguishes his contribution from the neoclassical theory of the firm. In effect, Williamson's arguments present a version of agency theory, with opportunism manifesting "hidden actions" (or moral hazard) and bounded rationality manifesting "hidden information" (or adverse selection).

Williamson defines "opportunism" as a condition of "self-interest seeking with guile." "Opportunism," says Williamson (1985, 47), "refers to the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse." Opportunism becomes an economic 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

[6] The following summary and critique of Williamson's theory draws on Lazonick 1991, chs. 6 and 7, and Lazonick 2002.

limitedly so" (Williamson 1985, 45). With unbounded rationality, economic actors would not be reliant on others for information. 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." With unbounded rationality, 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" (Williamson 1985, 56-57). Given bounded rationality, 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: "Behavioral 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" (Williamson 1985, 58-59).

What then 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 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." In a 1979 article on "transaction cost economics", Williamson introduced "transaction-specific assets' (i.e., 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 phenomenon that Williamson wanted to explain, however, was why, given the possibility of organizing transactions by markets, hierarchies – that is, business organizations – exist.[7] As Williamson (1985, 56) himself put it: "The absence of asset specificity [would] vitiate much of transaction cost economics."

[7] Indeed, in articulating the need to explain the existence and form of the modern enterprise, Williamson drew heavily on Chandler (1962 and 1977). See Lazonick 1991, chs. 6 and 7.

For Williamson, 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 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 (Williamson 1985: 34, 55-56, 95-96, 104).

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 (1985, 62), "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 (Williamson 1985, 52, 60, 72-73). 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 opportunistic behavior.

Non-market 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 (1985, 387-388): "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, Williamson (1985, 78) 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 (1985, 60; also 79, 151, 204), the economic advantage of internal organization resides in its relative ability to "work things out": "Whenever assets are specific in nontrivial degree, increasing the degree 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." 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 (Williamson 1985, 60).

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 and/or the fixed entrepreneurial factor, 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 to "work things out" in the face of opportunism and bounded rationality.

When contrasted with the neoclassical theory of the firm, the primary virtue of Williamson's transaction-cost theory is its focus on organizational relationships among self-interested individuals with cognitive limitations. The main problem with Williamson's theory is that he takes these behavioral and cognitive conditions as given – what, quoting Frank Knight (1965, 270), he describes as "human nature as we know it" – and employs a constrained-optimization methodology to analyze their economic implications in the presence of externally-imposed technological conditions. Hence Williamson's perspective lacks a theory of innovative strategy – that is, a strategy for confronting and transforming the constraining conditions (see Lazonick 1991, chs. 6 and 7). Indeed, Williamson views corporate strategy as inherently predatory behavior that raises prices and restricts output, whereas the theory of innovative enterprise sees corporate strategy as integral to an innovation process that can lower prices and expand output.[8]

In taking "asset specificity" as a given constraint on the behavior and performance of the firm, Williamson avoids the analysis of innovative enterprise. As Williamson (1985, 143) 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." 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 are 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 (Williamson 1985, 80).

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

[8] To quote Williamson (1985, 128): "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." This despite numerous references by Williamson to Alfred Chandler's The Visible Hand. For Williamson (1985, 128), "[s]trategic behavior has reference to efforts by dominant firms to take up and maintain advance or preemptive positions and/or to respond punitively to rivals." See Lazonick (1991, ch. 7) where I analyze in detail how, guided by transaction-cost theory, Williamson misrepresents and misinterprets the historical evidence on innovative enterprise presented by Chandler in The Visible Hand.

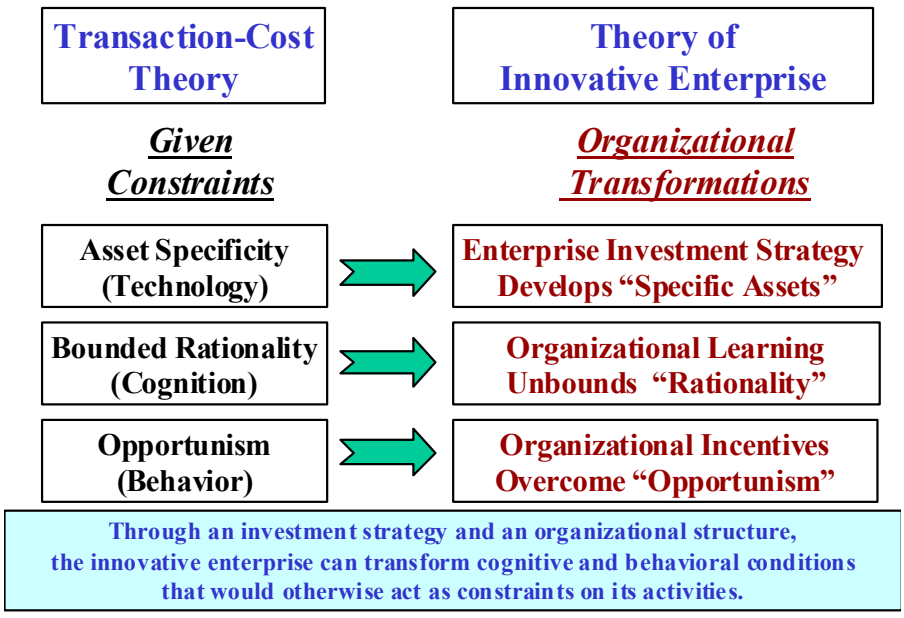
participants on a continuing basis. The modern business corporation, in contrast, according to Williamson, offers only "low-powered incentives," as exemplified by the payment of salaries that segment remuneration from productive effort (Williamson 1985, 132, 144-145). In the presence of asset specificity, and given inherent limits on cognitive competence and inexorable individual pursuit of self-interest with guile, in the Williamsonian firm "working things out" means optimizing subject to these technological, cognitive, and behavioral constraints.

In sharp contrast, for a theory of the innovative enterprise, "working things out" focuses on how, through an investment strategy and an organizational structure, the enterprise transforms industrial and organizational conditions so that the *resultant* asset specificity supports the generation of higher quality, lower cost products than had previously been available. From this perspective, the growth of the modern business corporation manifests "organizational success" based on the social conditions of innovative enterprise – strategic control, organizational integration, and financial commitment. The modern business corporation is not a response to "market imperfections" created by transaction costs.

For "working things out", organizational integration is critical to the success of an innovative strategy. As we have seen, organizational integration is 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 provides an essential social condition for an enterprise to engage in and make use of collective and cumulative, or organizational, learning.

Figure 5 considers the key concepts of Williamsonian transaction-cost theory from the perspective of the theory of innovative enterprise.

Figure 5. Transforming transaction-cost theory into innovation theory



Whereas Williamson takes bounded rationality and opportunism as given constraints on economic activity, organizational integration generates organizational learning by *transforming* 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.[9] 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 in the hierarchical and functional division of labor on whom the enterprise relies to develop and utilize productive resources.

4. Methodological, Ideological, and Political Implications of the Theory of Innovative Enterprise

The theory of innovative enterprise with its critique of neoclassical and transaction-cost theories of the firm confronts the methodology, ideology, and politics of conventional economics. Methodologically, the theory of innovative enterprise demonstrates the importance of an analysis that integrates theory and history so that theory functions as both a distillation of what we know and a guide to what we need to know. Ideologically, the theory of innovative enterprise argues that "in the beginning there were organizations" and that active markets in products, labor, and capital are outcomes, not causes, of economic development. Politically, the theory of innovative enterprise provides a framework for the governance of organizations and the regulation of markets to generate equitable and stable economic growth. In the concluding remarks that follow, I shall elaborate briefly on each of these implications of the theory of innovative enterprise.

Methodology:

The 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 point in time to generate higher quality, lower cost products over time. It follows from this definition that an optimizing firm that takes technological and markets as given in making its resource allocation decisions cannot generate innovation. As we have seen, the relation between an innovating firm and an optimizing firm can be modeled by asking

[9] The seminal theoretical work on the role of the executive in integrating the individual into the organization is Barnard (1938). In the book, Chester Barnard, who from 1927 to 1948 was the president of New Jersey Bell Telephone Company, focused on how the organization can transform (using Williamsonian terminology) "opportunism" into cooperation and "bounded rationality" into collective knowledge. Significantly in this regard, in 1933, a year that had the highest rate of unemployment in recorded US history, Barnard instituted a "no lay-off policy" at New Jersey Bell, instead adjusting to the downturn through an across-the-board reduction in working hours (Mahoney 2002, 161).

how, by transforming technological and/or and market conditions, 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 given 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.

The elaboration of the theory of innovative enterprise requires systematic comparative-historical research on the organizational and 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 (see, e.g., Lazonick 2005, 2010a). Writing at the end of his career, Joseph Schumpeter (1954, 12-13) advised: "Nobody can hope to understand the economic phenomena of any, including the present, epoch who has not an adequate command of the historical *facts* and an adequate amount of historical *sense* or of what may be described as *historical experience*." By "historical experience" Schumpeter meant the ability of the economist to integrate theory and history (see Lazonick 2011a). For theory to be relevant to real-world phenomena, it must be derived from the rigorous study of historical reality. To develop relevant theory requires an iterative methodology; one derives theoretical postulates from the study of the historical record, and uses the resultant theory to analyze history as an ongoing and, viewing the present as history, unfolding process. Theory, therefore, serves as an abstract explanation of what we already know, and as an analytical framework for identifying and researching what we need to know.

The constrained-optimization methodology that has been so central to the training of economists *i*s a useful tool analytical tool: an understanding of the industrial, organizational, and institutional conditions that "constrain" economic activity at a point in time can enable integrative research to be more systematic in analyzing how, why, and under what conditions certain "constraints" are, or are not, transformed over time. As a dominant methodology, however, constrained-optimization is typically 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. As Edith Penrose (1989) 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 (1989, 11) concluded: "universal truths without reference to time and space are unlikely to characterise economic affairs."

Obviously, rigorous historical analysis is essential if an economic theory is to have descriptive value. But in contrast to the "positive" economic methodology proposed in the 1950s by Milton Friedman (1953), rigorous historical analysis is also essential if a theory is to have predictive value. Friedman argued that, because all theories involve abstraction from reality, one's choice of theoretical assumptions does not matter as long as one's predictions prove to be correct.

There are two basic problems with this methodological position. First, if one's predictions do not prove to be correct (as has often been the case with neoclassical economists), then one requires a methodology that entails rigorous empirical analysis in order to discover what assumptions would yield correct predictions. Given their ahistorical constrained-optimization approach, neoclassical economists lack such a methodology. Second, even when one's predictions do prove to be correct at one point in time, they may prove to be incorrect at another point in time because the underlying model takes as given one or more variables that are in fact integral to the changes that have occurred over the time period. Put differently, two very different theoretical models may yield the same predictions at a point in time, but only one of the models may be able to account for changes in outcomes over time (see, e.g., Lazonick 1992, ch. 4). If a theory is to have predictive (and hence prescriptive) value, rigorous historical analysis (brought up to the present) is a precondition for rigorous logical analysis.

Basic to overcoming the intellectual constraints that render mainstream economics irrelevant, even when, for example, enriched by the cognitive and behavioral assumptions of Williamsonian transaction-cost approach, is the ability to do rigorous analysis of a dynamic historical process. To do historical analysis (again brought up to the present if one wants to inform current policy debates) does not mean, however, to neglect theory. Rather it means to make theory the servant of historical reality rather than a substitute for it.

In line with Schumpeter's notion of "historical experience", historical analysis provides us with the knowledge required to make relevant theoretical abstractions and to modify our adherence to abstractions previously adopted that fail to comprehend a changing reality. At the same time, theory provides us with a framework that directs our historical research to ask the relevant questions and explore the relevant material to provide answers. In short, economists require a methodology that brings history and theory into dynamic interaction with one another so that our theoretical deductions remain anchored in our understanding of history reality. And when that historical reality is of an *innovative* economy, it will by definition be a reality that is always in the process of change.

Ideology:

A methodological penchant for constrained optimization is conducive to an ideological attachment to the market mechanism as the preferred mode of resource allocation in the economy because a reliance on the market to allocate resources undermines the ability of

particular economic actors to exercise extraordinary control over the resource allocation process. In a "perfect" market economy individuals are, as Milton and Rose Friedman (1980) put it, "free to choose" how to allocate their own labor, capital, and income, but they are powerless to influence the resource-allocation decisions of anyone else.

Yet the existence in 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. The theory of innovative enterprise posits that a key determinant of superior economic performance is the willingness of people who could make use of markets to pursue their individual agendas to commit their working lives to collective organizations for the sake of developing and utilizing productive resources.

Investment in innovation is *not* a market process; it is not the response of producers to price signals that represent a demand for innovative capital products and consumer products. The market cannot demand products that do not yet exist. Developed markets in products, labor and capital are *outcomes*, not sources, of investment in innovative organizations (see Lazonick 2003). Moreover, for the sake of continued innovation, the organizations on which the economy depends for investments in real per capita productivity growth need to regulate these developed markets. In the absence of regulation, developed markets will tend to disrupt and undermine the organizational processes that generate innovation.

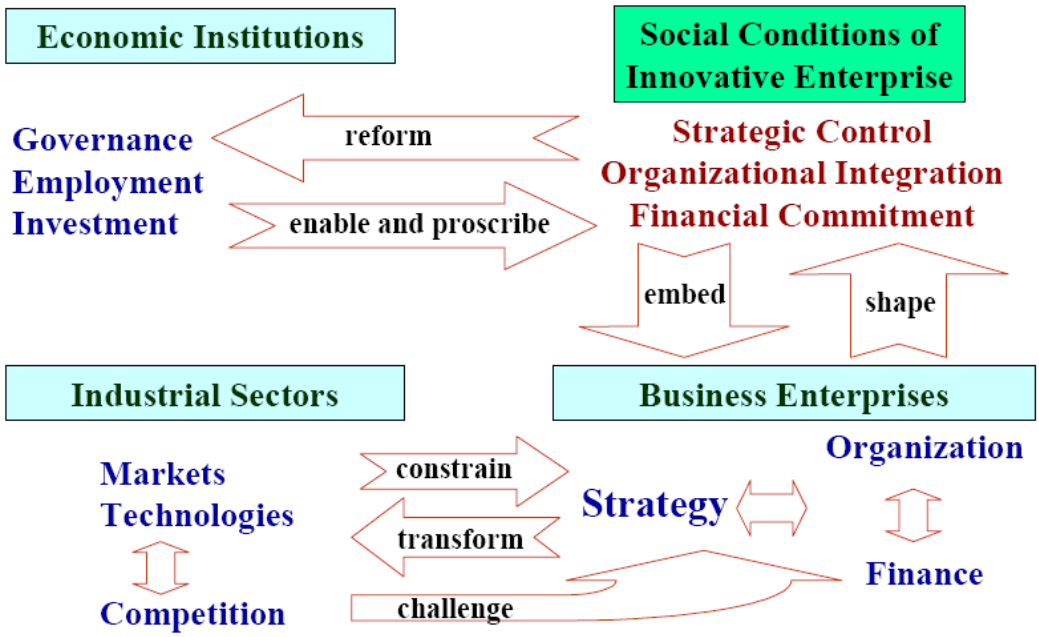
Conventional economists assume that an advanced economy is a market economy in which millions of individual decisions concerning the allocation of the economy's resources are aggregated into prices for inputs to and outputs from production processes. Any impediments to this process of market aggregation are deemed to be "market imperfections", and any undesirable social outcomes from the process are deemed to be "market failures". From the perspective of the theory of the market economy, liberal economists argue that the role of public policy is to design economic institutions to mitigate market imperfections by allowing market processes to function more smoothly and swiftly and to remedy market failures through government intervention intended to achieve more socially desirable outcomes. Conservative economists counter that market imperfections reflect inherent and immutable human behavior and that market failures reflect unsubstantiated or unwarranted value judgments by their liberal colleagues. But both sides of the academic aisle work within a received intellectual framework in which the perfection of markets, in terms of both processes and outcomes, would be the best of all possible worlds.

Markets *are* of utmost importance to our economy and society; they can allow us *as individuals* to choose the work we do, for whom we work, where we live, and what we consume (Lazonick 2003). Insofar as we have market choices, however, it is because the economy is wealthy. If market processes cannot explain investment in innovation, then the "best of all possible worlds" cannot explain the wealth of nations. If we, as economists, want to devise public policies to shape the processes and influence the outcomes of investment in innovation, we need to construct an economic theory of "organizational success" (Lazonick 2012b).

Politics:

If one accepts that business enterprises are social structures that are in turn embedded in larger (typically national) institutional environments, a theory of innovative enterprise must itself be embedded in a model of the relations among *industrial sectors*, *business enterprises*, and *economic institutions* that can support the processes that transform technologies and access markets to generate products that are higher quality and/or lower cost than those that had previously existed. Figure 6 provides a schematic perspective on the interactions among sectors, enterprises and institutions in shaping the social conditions of innovative enterprise.

Figure 6. Social conditions of innovative enterprise



Innovation differs across industrial sectors (lower-left section of Figure 6) in terms of the technologies that are developed and the markets that are accessed. In the theory of the optimizing firm, business enterprises take technologies and markets as given: they constrain the "strategy" of the business enterprise to be like that of each and every other firm in the industry. In the theory of the innovating firm, in contrast, enterprise strategy transforms technology and accesses markets. In doing so, strategy confronts technological uncertainty – the possibility that an innovative investment strategy will fail to develop higher quality products or processes – and market uncertainty – the possibility that the strategy will fail to access a large enough extent of the market to transform the high fixed costs of developing these products and processes into low unit costs. But, as indicated in the lower part of Figure 6, the innovating firm must also confront competitive uncertainty – the possibility that even if the firm is successful in transforming technology and accessing markets to develop higher quality, lower cost products than were previously available, competitors will do it better and cheaper.

The rise of new competition poses a challenge to the innovating firm. It can seek to make an innovative response or, alternatively, it can seek to adapt on the basis of the investments that it has already made by, for example, obtaining wage and work concessions from employees, debt relief from creditors, or tax breaks or other subsidies from the state. An enterprise that chooses the adaptive response in effect shifts from being an innovating to an optimizing firm. How the enterprise responds will depend on not only the abilities and incentives of those who exercise strategic control but also the skills and efforts that can be integrated in its organization and the committed finance that, in the face of competitive challenges, can be mobilized to sustain the innovation process.

If and when innovation is successful in a particular nation over a sustained period of time, the types of strategic control, organizational integration, and financial commitment that characterize the nation's innovating firms will constitute distinctive social conditions of innovative enterprise. Why, one might ask, would the social conditions of innovative enterprise exhibit similar characteristics across firms in a nation, particularly when they are engaged in different industries? And why, for a given industry, would the social conditions of innovative enterprise differ across nations?

The answer to both questions is that historically nations differ in their institutions. At any point in time these institutions both enable and proscribe the activities of firms, while over time distinctive elements of these institutions become embedded in the ways in which firms function. Of particular importance in influencing the social conditions of innovative enterprise are *economic* institutions related to *governance*, *employment*, and *investment*. Through a historical process, the strategic, organizational, and financial activities of a nation's innovative enterprises shape the characteristics of these economic institutions, but these institutions also exist and persist independently of these enterprises as part of the "social fabric" – the rules and norms of the nation applicable to economic activity that find application in the social relations of that nation's firms.

Governance institutions determine how a society assigns rights and responsibilities to different groups of people over the allocation of its productive resources and how it imposes restrictions on the development and utilization of these resources. Employment institutions determine how a society develops the capabilities of its present and future labor forces as well as levels of employment and conditions of work and remuneration. Investment institutions determine the ways in which a society ensures that sufficient financial resources will be available on a continuing basis to sustain the development of its productive capabilities. These economic institutions both enable and proscribe the strategic, organizational, and financial activities of business enterprises, thus influencing the conditions of innovative enterprise that characterize social relations within any given firm at any point in time. As these business enterprises succeed at innovation, they may reshape the conditions of innovative enterprise; for example, their strategic decision-makers, acting collectively, may take steps to reform these institutions to suit the new needs of their enterprises.

This highly schematic perspective, therefore, posits a dynamic historical relation between organizations and institutions in the evolution of the social conditions of innovative enterprise. To go beyond this schema requires the integration of the theory of innovative

enterprise with comparative research on the evolution of the conditions of innovative enterprise in different times and places – an exercise in comparative political economy. To study the innovative enterprise in abstraction from the particular social conditions that enable it to generate higher quality, lower costs products is to forego an understanding of how a firm becomes innovative in the first place and how its innovative capabilities may be rendered obsolete. A comparative-historical analysis enables us to learn from the past and provides working hypotheses for ongoing research. This approach also opens the door to the analysis of how political movements might operate at the intersection between economy and society to shape social institutions that, with innovative enterprise as a foundation, can achieve equitable and stable economic growth.

The objectives of government economic policy should be to support equitable and stable economic growth (see Lazonick and Mazzucato 2013). Growth is equitable when those who contribute to the growth process receive a commensurate share of the gains. The equitable sharing of the gains from growth should occur at the level of the enterprise through its relations with employees, suppliers, distributors, and financiers. Tax policy should be designed to ensure that the government secures an equitable return from the business sector on government investments in physical and human infrastructure as well as subsidies that companies use to generate innovation and growth.

When certain types of participants in the economy extract much more value than they create – that is, when the distribution of income is highly inequitable – the economy becomes unstable. The relation between consumption and production is thrown out of balance. Speculative investments are encouraged. Those who extract more than they create have an interest in manipulating financial markets to increase their own gain. Government policies should be designed to reduce the possibilities for value extraction that is not warranted by value creation. Such policies would seek to preserve the incentives to innovation while reducing the possibilities for gains from speculation and eliminating the possibilities for gains from manipulation.

In my recent empirical work on the current state of the US economy, I have argued that value extraction has indeed come to dominate value creation, and that the market-based ideology of "maximizing shareholder value" is destroying the US economy (see, e.g., Lazonick 2009a, 2009b, 2013a, 2013b, 2014a, 2014b, 2015a, 2015b). In the United States and elsewhere there is a pressing need to understand the politics that has enabled the financial economy to dominate the productive economy. Suffice it to conclude this essay with the argument that the analyses of how an economy achieves equitable and stable economic growth and the forces that undermine it require, as a foundation, a theory of innovative enterprise.

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