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Entrepreneurship and the Economic Theory of the Firm: Any Gains from Trade?

Abstract: Though they developed in isolation, the theory of entrepreneurship and the economic theory of the firm can be usefully integrated. In particular, the concept of entrepreneurship as judgment associated with Knight (1921) and some Austrian school economists aligns naturally with the theory of the firm. Because judgment cannot be purchased on the market, the entrepreneur needs a firm — a set of alienable assets he controls — to carry out his function. We show how this notion of judgment illuminates key themes in the modern theory of the firm (existence, boundaries, and internal organization). In our approach, resource uses are not *data*, but are *created* as entrepreneurs envision new ways of using assets to produce final goods. The entrepreneur's problem is aggravated by the fact that capital assets are heterogeneous. Asset ownership allows the entrepreneur to experiment with novel combinations of heterogeneous assets. The boundaries of the firm, as well as aspects of internal organization, may also be understood as responses to entrepreneurial processes of experimentation.

Introduction

Do entrepreneurs need business firms to carry out their function? Are business firms run by entrepreneurs, or by hired managers? Economists have been thinking and writing about entrepreneurship since at least the 18th century. Within the last few decades, the theory of the firm has become one of the fastest growing areas in applied microeconomics. And yet, surprisingly, the above questions have rarely been asked. The modern economic theory of the firm virtually ignores entrepreneurship, while the literature on entrepreneurship in economics and strategic management has limited use for the economic theory of the firm.¹

This lack of contact between two fields that seem to overlap so naturally results partly from the development of economic thought. The economic theory of the firm emerged and took shape as the entrepreneur was being banished from microeconomic analysis, first in the 1930s when the firm was subsumed into neoclassical price theory (O'Brien, 1984), and then in the 1980s as the theory of the firm was reformulated in the language of game theory and the economics of information. The gradual "hardening" of the neoclassical approach in economics, including the mainstream approach to the theory of the firm, left little room for the entrepreneurship; Baumol (1993b: 17) calls it "the specter which haunts economic models." In modern contributions to the theory of the firm (Williamson, 1975, 1985, 1996; Milgrom and Roberts, 1992; Hart, 1995) reference to entrepreneurship is passing at best. These approaches are largely static and "closed," meaning that they focus on solutions to given optimization problems, avoiding questions about the origin of the problem at hand, or indeed of the firm itself. Agency theory, for example, has generated important insights on the effects of incentives on effort and the relationship between incentive pay and risk. In explaining how a principal gets an agent to do something, however, the theory overlooks the more fundamental question of *what* the principal should want the agent to do, or indeed, how the principal got to be a principal in the first place (Foss and Foss, 2002).

We argue that the theory of entrepreneurship and the theory of the firm can be usefully integrated. We begin by surveying various approaches to entrepreneurship in the economics literature, asking to what extent the entrepreneur needs a firm (a set of alienable assets he controls) to carry out his function ("*Does the Entrepreneur Need a Firm?*"). We conclude that only the concept of *entrepreneurship as judgment* has a direct and natural link to the theory of the firm. Because judgment cannot be purchased on the market, the entrepreneur needs a firm — a set of alienable assets he controls — to carry out his function. Next, we review briefly the main themes in the modern theory

¹ The terms "entrepreneur" and "entrepreneurship" do not even appear in the indexes of leading texts on the economics of organization and management such as Brickley, Smith, and Zimmerman (2004) or Banko, Dranove, Shanley, and Schaefer (2004). Two British surveys of economics principles textbooks (Kent, 1989; Kent and Rushing, 1999) confirm a similar absence of the concept.

of the firm (existence, boundaries, and internal organization) and show how the notion of entrepreneurship as judgment illuminates these issues in novel ways (“*Putting Entrepreneurship into the Theory of the Firm: Judgment and Economic Organization*”). To develop a judgment-based approach to economic organization, we also draw on ideas from Austrian economics (Mises, 1949; Kirzner, 1973; Salerno, 1993) – the body of economics that is perhaps most intimately connected to ideas on entrepreneurship – and on property rights economics (Hart, 1995; Barzel, 1997), an important part of modern organizational economics. In our approach, resource uses are not *data*, but are *created* as entrepreneurs envision new ways of using assets to produce goods. The entrepreneur’s decision problem is aggravated by the fact that capital assets are *heterogeneous*, and it is not immediately obvious how they should be combined. Asset ownership allows the entrepreneur to experiment with novel combinations of heterogeneous assets.

A number of unconventional insights emerge from this approach. First, we argue that the existence of the firm may be understood in terms of limits to the market for judgments about how to combine heterogeneous assets to meet future wants. Second, we argue that the boundaries of the firm, as well as aspects of internal organization, may be understood as responses to entrepreneurial processes of experimentation. In this connection, we introduce a distinction between productive and destructive entrepreneurship and argue that it is useful for understanding the internal organization of the firm.

Does the Entrepreneur Need a Firm?

The Firm and the Entrepreneur in Economics

Because entrepreneurs in many ways personify market forces, one might expect them to be *the* central figures in economics. Similarly, because most entrepreneurial ventures somehow involve a firm, entrepreneurship in the context of firm organization would seem to be a central subject in the theory of markets. While some classical economists, particularly Jean-Baptiste Say and Jeremy Bentham, reasoned this way, it is hardly characteristic of modern economics.² As the historian of economic thought Paul McNulty (1984: 240) puts it:

The perfection of the concept of competition . . . which was at the heart of the development of economics as a science during the nineteenth and early

² As Machovec (1995: 109) notes, to the classical economists “specialization and commercial freedom spawned opportunities for alert individuals.” Unlike later economists, the classical economists held what is essentially a process view in which competition was seen “as a tapestry of aggressive commercial behaviors which created pure profits by speculating on price futures, engineering new methods of production, and inspiring new product lines to better serve consumers” (*ibid.*: 136). This is not true of Adam Smith, however; Schumpeter (1949: 65) writes that “the leading or directing activity as a distinctive function played a surprisingly small role in [Smith’s] analytic scheme of the economic process.”

twentieth centuries, led on the one hand to an increasingly rigorous analytical treatment of market processes and on the other hand to an increasingly passive role for the firm.

The “increasingly rigorous analytical treatment” of markets, notably in the form of general equilibrium theory, not only made firms increasingly “passive,” it also made the model of the firm increasingly stylized and anonymous, doing away with those dynamic aspects of markets that are most closely related to entrepreneurship (O’Brien, 1984). In particular, the development of what came to be known as the “production function view” (Williamson, 1985; Langlois and Foss, 1999) – roughly, the firm as it is presented in intermediate microeconomics textbooks with its fully transparent production possibility sets – was a deathblow to the theory of entrepreneurship in the context of firm organization. If any firm can do what any other firm does (Demsetz, 1991), if all firms are always on their production possibility frontiers, and if firms always make optimal choices of input combinations and output levels, then there is no room for entrepreneurship.

As this has been the dominant view of the firm in economics at least since the 1930s, it is not surprising that much of the important work on the economics of entrepreneurship was done prior to this period (e.g., Schumpeter), and that more recent work by economists on entrepreneurship has been done largely outside of the confines of mainstream economics (e.g., Kirzner). However, as we argue later, advances in economics over the last two to three decades have left economics somewhat better equipped to deal with entrepreneurship and to incorporate it into models of firm organization.

Our approach below is to ask if the entrepreneur needs a firm, and if so, what it is that firm organization can do for entrepreneurs. The answers are not obvious. Some approaches to entrepreneurship – Schumpeter’s concept of the entrepreneur as innovator, for instance – treat the entrepreneur as an uncaused cause, a pure genius who operates outside the usual constraints imposed by resource owners and other market participants and is thus unaffected by the firm. Other approaches treat entrepreneurs as skilled managers, exercising their entrepreneurial talents through skillful arrangements of productive factors, thus being an integral part of the firm’s operation.³

Concepts of Entrepreneurship

Entrepreneurship as management. In the entrepreneurship curriculum of many business schools, the phenomenon under investigation has often been “small-business management.”⁴ Entrepreneurs are pictured as the managers of small, family-owned businesses or start-up companies. Entrepreneurship consists of routine management

³ On the history of the entrepreneurship concept in economic theory, see Elkjaer (1991) and Ibrahim and Vyakarnam (2003).

⁴ However, this appears to be slowly changing towards a more generic and theoretically based understanding of entrepreneurship.

tasks, relationships with venture capitalists and other sources of external finance, product development, marketing, and so on. In this sense, entrepreneurship and the theory of the firm – the theory of *some* firms, at least – are inextricably linked. The theory of entrepreneurship in this approach is the theory of how small business owners organize and manage their assets.

Unfortunately, this notion of entrepreneurship is sufficiently elastic to be practically meaningless. It appears to include virtually all aspects of small or new business management, while excluding the identical tasks when performed within a large or established business. Put differently, if entrepreneurship is simply a set of management activities, or any management activity that takes place within a particular type of firm, then it is unclear why we should bother to add this label to those activities.

Entrepreneurship as imagination or creativity. It is common, particularly within the management literature, to associate entrepreneurship with boldness, daring, imagination, or creativity (Begley and Boyd, 1987; Chandler and Jansen, 1992; Aldrich and Wiedenmayer, 1993; Hood and Young, 1993; Lumpkin and Dess, 1996). These accounts emphasize the personal, psychological characteristics of the entrepreneur. Entrepreneurship, in this conception, is not a necessary component of all human decision-making, but a specialized activity that some individuals are particularly well equipped to perform.⁵

If these characteristics are the essence of entrepreneurship, then entrepreneurship has no obvious link to the theory of the firm (at least not without further arguments). The relevant personal characteristics can presumably be acquired by contract on the market by purchasing consulting services, project management, and the like. A “non-entrepreneurial” owner or manager, in other words, can manage the day-to-day operations of the firm, purchasing entrepreneurial services on the market as needed. Moreover, the literature does not explain clearly whether imagination and creativity are necessary, sufficient, or incidental conditions for entrepreneurship. Clearly the founders of many firms are imaginative and creative. If not, are they not entrepreneurs?

Entrepreneurship as innovation. Probably the best-known concept of entrepreneurship in economics is Joseph Schumpeter’s idea of the entrepreneur as innovator. Schumpeter’s entrepreneur introduces “new combinations” – new products, production methods, markets, sources of supply, or industrial combinations – shaking the economy out of its previous equilibrium through a process Schumpeter termed “creative destruction.” The entrepreneur-innovator is introduced in Schumpeter’s groundbreaking *Theory of Economic Development* (1911) and developed further in his two-volume work, *Business Cycles* (1939). Realizing that the entrepreneur has no place in the

⁵ As Gartner (1988: 21) argues, however, this literature employs a host of different (and frequently) contradictory notions of entrepreneurship. A “startling number of traits and characteristics have been attributed to the entrepreneur, and a ‘psychological profile’ of the entrepreneur assembled from these studies would portray someone larger than life, full of contradictions, and, conversely, someone so full of traits that (s)he would have to be a sort of generic ‘Everyman.’”

general-equilibrium system of Walras, whom Schumpeter greatly admired, Schumpeter gave the entrepreneur a role as the source of economic change.⁶ “[I]n capitalist reality as distinguished from its textbook picture, it is not [price] competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization . . . competition which commands a decisive cost or quality advantage and which strikes not at the margins of profits and the outputs of existing firms but at their foundations and their very lives” (Schumpeter, 1942: 84).

Schumpeter carefully distinguished the entrepreneur from the capitalist (and strongly criticized the neoclassical economists for confusing the two). His entrepreneur need not own capital, or even work within the confines of a business firm at all. While the entrepreneur could be a manager or owner of a firm, he is more likely to be an independent contractor or craftsman. In Schumpeter’s conception, “people act as entrepreneurs only when they actually carry out new combinations, and lose the character of entrepreneurs as soon as they have built up their business, after which they settle down to running it as other people run their businesses” (Ekelund and Hébert, 1990: 569).

This suggests a rather tenuous relationship between the entrepreneur and the firm he owns, works for, or contracts with. Entrepreneurship is exercised within the firm when new products, processes, or strategies are introduced, but not otherwise. The day-to-day operations of the firm need not involve entrepreneurship at all. Moreover, because Schumpeterian entrepreneurship is *sui generis*, independent of its environment, the nature and structure of the firm does not affect the level of entrepreneurship. Corporate R&D budgets, along with organizational structures that encourage managerial commitment to innovation (Hitt and Hoskisson, 1994), have little to do with Schumpeterian entrepreneurship *per se*.⁷

Entrepreneurship as alertness or discovery. Entrepreneurship can also be conceived as “alertness” to profit opportunities. While present in Cantillon’s and J. B. Clark’s notions of entrepreneurship, this concept has been elaborated most fully by Israel Kirzner (1973, 1979, 1992). Kirzner follows Hayek (1968) in describing competition as a discovery process: the source of entrepreneurial profit is superior foresight – the discovery of something (new products, cost-saving technology) unknown to other market participants. The simplest case is that of the arbitrageur, who discovers a discrepancy in present prices that can be exploited for financial gain. In a more typical case, the entrepreneur is alert to a new product or a superior production process and steps in to fill this market gap before others. Success, in this view, comes not from following a

⁶ This includes, but is not limited to, the formation of new business ventures.

⁷ Other writers influenced by Schumpeter, however, such as Baumol (1993a), do view public and private R&D, the scale and scope of patent protection, and basic science education as important determinants of the level of entrepreneurial activity.

well-specified maximization problem, but from having some knowledge or insight that no one else has – that is, from something beyond the given optimization framework.⁸

Kirzner's entrepreneurs do not own capital; they need only be alert to profit opportunities. Because they own no assets, they bear no uncertainty. Critics have seized on this as a defect in Kirzner's conception. According to this criticism, mere alertness to a profit opportunity is not sufficient for earning profits. To reap financial gain, the entrepreneur must invest resources to realize the discovered profit opportunity. "Entrepreneurial ideas without money are mere parlor games until the money is obtained and committed to the projects" (Rothbard, 1985: 283). Moreover, excepting the few cases where buying low and selling high are nearly instantaneous (say, electronic trading of currencies or commodity futures), even arbitrage transactions require some time to complete. The selling price may fall before the arbitrageur has made his sale, and thus even the pure arbitrageur faces some probability of loss. In Kirzner's formulation, the worst that can happen to an entrepreneur is the failure to discover an existing profit opportunity. Entrepreneurs either earn profits or break even, but it is unclear how they suffer losses.

For these reasons, the link between Kirznerian entrepreneurship and the theory of the firm is weak. Owners, managers, employees, and independent contractors can all be alert to new profit opportunities; Kirzner's entrepreneur does not need a firm to exercise his function in the economy.

Entrepreneurship as charismatic leadership. Another strand of literature, incorporating insights from economics, psychology, and sociology and leaning heavily on Max Weber, associates entrepreneurship with charismatic leadership. Entrepreneurs, in this view, specialize in communication – the ability to articulate a plan, a set of rules, or a broader vision, and impose it on others. Casson (2000) calls these plans "mental models" of reality. The successful entrepreneur excels at communicating these models to others, who come to share the entrepreneur's vision (and become his followers). Such entrepreneurs are also typically optimistic, self-confident, and enthusiastic (though it is not clear whether these are necessary conditions).

Witt (1998a, 1998b) describes entrepreneurship as "cognitive leadership." He outlines an entrepreneurial theory of the firm that combines recent literature on cognitive psychology with Kirzner's concept of alertness. Entrepreneurs require complementary factors of production, he argues, which are coordinated within the firm. For the firm to be successful, the entrepreneur must establish a tacit, shared framework of goals, which governs the relationships among members of the entrepreneur's team. As

⁸ Kirzner's view of superior foresight differs from Stigler's concept of search in which the value of new knowledge is known in advance, available to anyone willing to pay the relevant search costs. "Stigler's searcher decides how much time it is worth spending rummaging through dusty attics and untidy drawers looking for a sketch which (the family recalls) Aunt Enid thought might be by Lautrec. Kirzner's entrepreneur enters a house and glances lazily at the pictures which have been hanging in the same place for years. 'Isn't that a Lautrec on the wall?'" (Ricketts, 1987: 58).

Langlois (1998) points out, it is often easier (less costly) for individuals to commit to a specific individual, the leader, rather than an abstract set of complex rules governing the firm's operations. The appropriate exercise of charismatic authority, then, reduces coordination costs within organizations.

A possible weakness of this approach, in our view, is its emphasis on human assets, rather than the inalienable physical assets the entrepreneur controls. Must the charismatic leader necessarily own physical capital, or can he be an employee or independent contractor? Formulating a business plan, communicating a "corporate culture," and the like are clearly important dimensions of business leadership. But are they attributes of the successful manager or the successful entrepreneur? Even if top-level managerial skill were the same as entrepreneurship, it is unclear why charismatic leadership should be regarded as more "entrepreneurial" than other, comparatively mundane managerial tasks such as structuring incentives, limiting opportunism, administering rewards, and so on.

Entrepreneurship as judgment. An alternative to the foregoing accounts is that entrepreneurship consists of judgmental decision-making under conditions of uncertainty. Judgment refers primarily to business decision-making when the range of possible future outcomes, let alone the likelihood of individual outcomes, is generally unknown (what Knight [1921] terms uncertainty, rather than mere probabilistic risk). This view finds expression in the earliest known discussion of entrepreneurship, that found in Richard Cantillon's *Essai sur la nature de commerce en général* (1755). Cantillon argues that all market participants, with the exception of landowners and the nobility, can be classified as either entrepreneurs or wage earners:

Entrepreneurs work for uncertain wages, so to speak, and all others for certain wages until they have them, although their functions and their rank are very disproportionate. The General who has a salary, the Courtier who has a pension, and the Domestic who has wages, are in the latter class. All the others are Entrepreneurs, whether they establish themselves with a capital to carry on their enterprise, or are Entrepreneurs of their own work without any capital, and they may be considered as living subject to uncertainty; even Beggars and Robbers are Entrepreneurs of this class (Cantillon, 1755: 54).

Bearing risk—that is, making decisions under conditions of uncertainty—is the entrepreneur's *raison d'être*.

Judgment is distinct from boldness, innovation, alertness, and leadership. Judgment must be exercised in mundane circumstances, for ongoing operations as well as new ventures. While alertness tends to be passive (perhaps even hard to distinguish from luck [Demsetz, 1983]), judgment is active. Entrepreneurs "are those who seek to profit by actively promoting adjustment to change. They are not content to passively adjust their . . . activities to readily foreseeable changes or changes that have already occurred in their circumstances; rather, they regard change itself as an opportunity to

meliorate their own conditions and aggressively attempt to anticipate and exploit it” (Salerno, 1993: 123). Those who specialize in judgmental decision-making may be dynamic, charismatic leaders, but they need not possess these traits. Decision making under uncertainty is entrepreneurial, whether it involves imagination, creativity, leadership, and related factors or not.⁹

Entrepreneurial Judgment as a Natural Complement to the Theory of the Firm

While the view of entrepreneurship as judgment appears in many writers, it is most often associated with Knight (1921). For Knight, firm organization, profit, and the entrepreneur are closely related. In his view, these arise as an embodiment, a result, and a cause, respectively, of commercial experimentation (Demsetz, 1988).¹⁰

Knight introduces the notion of judgment to link profit and the firm to the existence of uncertainty. Judgment primarily refers to the process of businessmen forming estimates of future events in situations in which there is no agreement or idea at all on probabilities of occurrence. Judgment is learned and tends to have a large tacit component. Entrepreneurship represents judgment that cannot be assessed in terms of its marginal product and which cannot, accordingly, be paid a wage.¹¹ This is particularly because entrepreneurship is judgment about the most uncertain events, such as starting a new firm, defining a new market, and the like.

In other words, there is no market for the judgment that entrepreneurs rely on, so exercising judgment requires the person with judgment to start a firm. Judgment thus implies asset ownership, for judgmental decision-making is ultimately decision-making *about the employment of resources*. An entrepreneur without capital goods is, in Knight’s sense, no entrepreneur.¹² This implies an obvious link with the theory of the

⁹ Mises (1949) introduces entrepreneurship to explain profit and loss. In the marginal productivity theory of distribution, laborers earn wages, capitalists earn interest, and owners of specific factors earn rents. Any excess (deficit) of a firm’s realized receipts over these factor payments constitutes profit (loss). Profit and loss, therefore, are returns to entrepreneurship. In a hypothetical equilibrium without uncertainty (what Mises calls the “evenly rotating economy”), capitalists would still earn interest, as a reward for lending, but there would be no profit or loss.

¹⁰ Knight explains that “[w]ith uncertainty entirely absent, every individual being in possession of perfect knowledge, there would be no occasion for anything of the nature of responsible management or control of productive activities . . . Its existence in the world is a direct result of the fact of uncertainty” (1921: 267, 271).

¹¹ “The receipt of profit in a particular case may be argued to be the result of superior judgment. But it is judgment of judgment, especially one’s own judgment, and in an individual case there is no way of telling good judgment from good luck and a succession of cases sufficient to evaluate the judgment or determine its probable value transforms the profit into a wage. . . . If . . . capacities were known, the compensation for exercising them can be competitively imputed and is a wage; only, in so far as they are unknown or known only to the possessor himself, do they give rise to a profit” (Knight, 1921: 311).

¹² Carl Menger’s (1871) treatment of production gives the entrepreneur a similar role. Production requires an “act of will” and “supervision of the execution of the production plan.” These functions “entail property ownership and, therefore, mark the Mengerian entrepreneur as a capitalist-entrepreneur” (Salerno, 1998: 30). Menger describes “command of the services of capital” as a “necessary prerequisite”

firm, particularly those (transaction cost and property rights theories) that define asset ownership as a crucial ingredient of firm organization (Williamson, 1996; Hart, 1995). The firm, in this sense, is the entrepreneur and the alienable assets he owns, and therefore ultimately controls. The theory of the firm is essentially a theory of how the entrepreneur exercises his judgmental decision-making – what combinations of assets will he seek to acquire, what (proximate) decisions will he delegate to subordinates, how will he provide incentives and employ monitoring to see that his assets are used consistently with his judgments, and so on.

Putting Entrepreneurship into the Theory of the Firm: Judgment and Economic Organization

At least some concepts of entrepreneurship, then, have implications for resource ownership, and thus for the formation and organization of firms. How, though, is entrepreneurship best incorporated into the theory of the firm? What role might the entrepreneur play in various economic approaches to the firm?

Established Theories of the Firm

The neoclassical theory of the firm. As noted earlier, the neoclassical theory of the firm that forms the basis of competitive general equilibrium (and some game-theoretic) models has no place for the entrepreneur. In economics textbooks, the “firm” is a production function or production possibilities set, a “black box” that transforms inputs into outputs. The firm is modeled as a single actor, facing a series of decisions that are portrayed as uncomplicated: what level of output to produce, how much of each factor to hire, and the like. These “decisions,” of course, are not really decisions at all; they are trivial mathematical calculations, implicit in the underlying data. In the long run, the firm may choose an optimal size and output mix, but even these are determined by the characteristics of the production function (economies of scale, scope, and sequence). In short: the firm is a set of cost curves, and the “theory of the firm” is a calculus problem. There is nothing for an entrepreneur to do.

While descriptively vacuous, the production-function approach has the appeal of analytical tractability along with its elegant parallel to neoclassical consumer theory (profit maximization is like utility maximization, isoquants are like indifference curves, and so on). Nonetheless, many economists now see it as increasingly unsatisfactory, as unable to account for a variety of real-world business practices: vertical and lateral integration, mergers, geographic and product-line diversification, franchising, long-term

for economic activity. Even in large firms, although he may employ “several helpers,” the entrepreneur himself continues to bear uncertainty, perform economic calculation, and supervise production, even if these functions “are ultimately confined . . . to determining the allocation of portions of wealth to particular productive purposes only by general categories, and to selection and control of persons” (Menger, 1871: 160–61).

commercial contracting, transfer pricing, research joint ventures, and many others. The inadequacy of the traditional theory of the firm explains much of the recent interest in agency theory, transaction cost economics, the property-rights approach, and other theories spawned by Coase's landmark 1937 article, "The Nature of the Firm."

The Coasian (contractual) framework. Coase (1937) introduced a fundamentally new way to think about the firm. Coase argued that in the world of neoclassical price theory, firms have no reason to exist. Because we observe firms, he reasoned, there must be a "cost to using the price mechanism" (Coase, 1937: 390). Market exchange entails certain costs: discovering the relevant prices, negotiating and enforcing contracts, and so on. Within the firm, the entrepreneur may be able to reduce these "transaction costs" by coordinating these activities himself. However, internal organization brings other kinds of transaction costs, namely problems of information flow, incentives, monitoring, and performance evaluation. The boundary of the firm, then, is determined by the tradeoff, at the margin, between the relative transaction costs of external and internal exchange. In a single brief paper, Coase laid out the basic *desiderata* of the economic theory of the firm, namely accounting in a comparative-institutional manner for the allocation of transactions across alternative governance structures. Although terminology and specific insights may differ, most modern theories of the firm may be said to be Coasian in the sense that they adhere to this program. But what of the entrepreneur in Coase's thought?

Coase's position is ambiguous.¹³ Although he uses the term, his "entrepreneur" seems to be more engaged in the mechanical exercise of comparing the costs of organizing given transactions in given governance structures than in engaging in future-oriented speculative acts (Boudreaux and Holcombe, 1991). On the other hand, Coase stresses certain aspects of economic organization that are best understood in the context of entrepreneurial activities. Notably, his discussion of the employment contract appeals to unpredictability and the need for qualitative coordination in a world of uncertainty (Langlois and Foss, 1999). This provides ample room for the entrepreneur as a speculating and coordinating agent. However, this potential was not fulfilled, neither in Coase's own thought, nor, as we shall see, in later post-Coasian contribution to the economic theory of the firm.

Modern organizational economics. The post-Coasian theory of the firm — or more generally, organizational economics — follows Coase in conceiving the firm as a contractual entity whose existence, boundaries, and internal organization can be explained in terms of economizing on (various types of) transaction costs. This is not to say that any one theory in modern organizational economics has addressed all these three key issues in a unified framework incorporating the same kind of transaction costs. Indeed, a possible perspective on the division of labor that exists within the modern theory of the firm is that while the principal-agent approach (Holmström and Milgrom, 1991) and team theory (Marschak and Radner, 1972) are mainly relevant for understand-

¹³ Coase dismissed Knight's (1921) explanation. It is arguable that he misunderstood Knight (Foss 1996).

ing internal organization, the transaction cost (Williamson, 1985) and property rights approaches (Hart, 1995; Hart and Moore, 1990) are designed to explain firm boundaries.

These approaches have stressed different kinds of transaction costs leading in different ways to contractual imperfection and therefore to economic outcomes inferior to the full-information, zero-transaction-cost ideal. For instance, principal-agent theory emphasizes the costs of monitoring contractual relationships in light of potential moral hazard. The property rights approach emphasizes the costs of writing (complete) contracts. The transaction cost approach also emphasizes contracting costs, but particularly the costs of adjusting to unanticipated contingencies.¹⁴

Of the four approaches, only the transaction costs approach and the property rights approach are conventionally considered theories of the firm in the strict sense. Neither team theory nor principal-agent theory explains the boundaries of the firm, defined in terms of asset ownership (Hart, 1995). Such an explanation must presuppose that contracts are incomplete; otherwise, everything can be stipulated contractually and there is no need for ownership, the “residual right” to make decisions under conditions not specified by contract. Transaction cost economics and property rights theory, by contrast, assume that contracts are incomplete, meaning that some contingencies or outcomes are not specified in the contract.

Following Oliver Williamson (1985, 1996), organizational economics has placed particular emphasis on specific (or highly complementary) assets in explaining the boundaries of the firm.¹⁵ Assets are said to be highly specific when their value in the present (best) use is much greater than their value in the second-best use. Investment in such assets exposes agents to a potential hazard: once investments are made and contracts are signed, unanticipated changes in circumstances can give rise to costly renegotiation. One party can threaten to pull out of the arrangement – reducing the value of the specific assets – unless that party is allocated a greater share of the quasi-rents of joint production. Fear of being “held up” in this way distorts *ex ante* investment levels, reducing the joint surplus produced by the relationship. Quasi-rents can be safeguarded through vertical integration, where merger eliminates any adversarial interests. Less extreme options include long-term contracts, partial ownership, or agreements for both parties to invest in offsetting relationship-specific investments. Overall, several governance structures may be employed. According to transaction cost theory, parties tend to choose the governance structure that best controls the underinvestment problem, given the particulars of the relationship.

In Hart’s (1995) formulation, integration does not eliminate opportunism, but rather changes the incentives to engage in opportunism. By giving property rights to the (non-human) specific assets to the party whose *ex ante* investment most effects the

¹⁴ This is a bit of a rational reconstruction on our part: Formal contract theorists, such as principal-agent or property right theorists, are uncomfortable with the notion of “transaction cost.”

¹⁵ For expository reasons, we here suppress the differences between Williamson’s and Hart’s versions of this story.

joint surplus, the harmful effects of opportunism can be mitigated. The key assumption in this story is that contracts are left incomplete because (for instance) the transaction costs of drafting complete contracts are prohibitive. It is the need to make decisions under circumstances that are not covered by the contract that makes hold-up and its consequences possible.

Putting entrepreneurship into the modern theory of the firm. The analytical apparatus of modern organizational economics offers many opportunities for incorporating concepts of entrepreneurship, particularly the notion of entrepreneurship as judgment. For example, the emphasis on asset ownership as a crucial aspect of firm organization accords well with Knight's (1921) views, as does the emphasis on incomplete contracting. Theories of decision-making under asymmetric information help illustrate what is distinctive about entrepreneurship, compared to other kinds of decision-making. In many ways, however, the modern economics of organization retains the structure of the neoclassical theory of the firm it supplanted. For example, as capabilities theorists (Langlois and Foss, 1999) have pointed out, the modern economics of organization has merely grafted a super-structure of asymmetric information, transaction costs, and the like on top of the neoclassical theory of production. Moreover, the modern economics of organization is almost as deterministic and "closed" as the neoclassical theory of the firm: while notions of uncertainty, ignorance, and surprise are occasionally invoked in the literature, they serve merely as rhetorical devices to justify the assumption that contracts are incomplete (Foss, 2003). Such notions are not themselves explained, nor are they used to incorporate process and entrepreneurship. Still, key insights from organizational economics and the concept of entrepreneurial judgment may be usefully joined into a more complete theory of economic organization.

In the following, we show how the view of entrepreneurship as judgment and can be put into organizational economics. We address the three classical themes of the firm's existence, boundaries, and internal organization. Consistent with the view that entrepreneurship as judgment implies asset ownership, we start with a discussion of capital heterogeneity.¹⁶

Assets, Attributes, and Entrepreneurship

The entrepreneur's primary function is to choose among the various combinations of inputs suitable for producing particular goods (and to decide whether these goods should be produced at all), based on current prices for the factors and expected future prices of the final goods (Knight, 1921).¹⁷ If capital is a single "good," with one

¹⁶ For an attempt to ground this explicitly in Austrian capital theory, see Foss, Foss, Klein, and Klein (2002).

¹⁷ This formulation makes it clear that financiers — those who determine how much capital is available to each firm and each branch of industry — are also entrepreneurs. In the traditional, production-function theory of the firm, capital markets do little but supply financial capital to managers, who can get as much capital as they wish at the going market price. In a more sophisticated understanding, managers do not decide how much capital they want; capitalists decide where capital should be allocated. In doing so,

price, then entrepreneurship is reduced to choosing between capital-intensive and labor-intensive production methods (or among types of labor).¹⁸ Lachmann (1956: 13, 16), by contrast, stresses that real-world entrepreneurship consists primarily of choosing among combinations of heterogeneous capital assets:

We are living in a world of unexpected change; hence capital combinations . . . will be ever changing, will be dissolved and re-formed. In this activity, we find the real function of the entrepreneur.

[T]he entrepreneur's function . . . is to *specify* and make decisions on the concrete form the capital resources shall have. He specifies and modifies the layout of his plant . . . As long as we disregard the heterogeneity of capital, the true function of the entrepreneur must also remain hidden.

In other words, the entrepreneur's decision problem is complicated by the heterogeneity of capital assets. While it is common to view capital heterogeneity in terms of physical heterogeneity – beer barrels and blast furnaces are different because of their physical differences – an economic approach emphasizes that capital goods are heterogeneous because they have different levels and kinds of valued *attributes* (in the terminology of Barzel, 1997).

Attributes. Attributes are characteristics, functions, possible uses of assets, etc., as perceived by an entrepreneur. For example, a copying machine has multiple attributes because it can be used at different time, by different people, for different types of copying work; that it can be purchased in different colors and sizes; and so on. Clearly, virtually all assets have multiple attributes. Assets are heterogeneous to the extent that they have different, and different levels of, valued attributes. Attributes may also vary over time, even for a particular asset. In a world of “true” uncertainty, entrepreneurs are unlikely to know all relevant attributes of all assets when production decisions are made. Nor can the future attributes of an asset, as it is used in production, be forecast with certainty.¹⁹ Future attributes must be *discovered*, over time, as assets are used in

they provide essential discipline to the manager, who Mises (1949: 304) calls the entrepreneur's “junior partner” (Klein, 1999).

¹⁸ Moreover, in a world of homogenous capital assets (resources), economic organization would be relatively unimportant. All capital assets possess the same attributes, and thus the costs of inspecting, measuring, and monitoring the attributes of productive assets is trivial. Exchange markets for assets would be virtually devoid of transaction costs. A few basic contractual problems – in particular, principal-agent conflicts over the supply of labor services – would remain, though workers would all use identical capital assets. However, it is hard to see what role ownership of capital assets would play in this world. If the costs of measuring and specifying attributes are low, entrepreneurs and factor owners could contract over attributes, and there would be little incentive to acquire ownership of assets themselves. Transactions involving such assets would be governed by complete, contingent contracts. Because contracts would substitute for ownership in a homogenous capital world, the boundaries of firms would be indeterminate (Hart 1995).

¹⁹ This sense of uncertainty links naturally to the notion of contractual incompleteness. We explore the implications of this idea below.

production. Or, to formulate the problem slightly differently, future attributes are *created* as entrepreneurs envision new ways of using assets to produce goods.

Ownership and entrepreneurship. Focusing on attributes not only helps to illustrate the concept of heterogeneous capital, but also illuminates the vast literature on property rights and ownership. Barzel (1997) stresses that property rights are held over attributes, and property rights to *known* attributes are the relevant units of analysis in his work. In contrast, he dismisses the notion of asset ownership as essentially legal and extra-economic. Similarly, Demsetz argues that the notion of “full private ownership” over assets is “vague,” and “must always remain so” because “there is an infinity of potential rights of actions that can be owned . . . It is impossible to describe the complete set of rights that are potentially ownable” (Demsetz 1988: 19).

However, as we noted above, most assets have unspecified, not-yet-created or not-yet-discovered attributes, and an important function of entrepreneurship is to create or discover them. Contrary to Demsetz, it is exactly this feature that creates a distinct role for asset ownership – that is, for acquiring legal title to a bundle of existing attributes as well as to future attributes. Specifically, ownership is a low-cost means of allocating the rights to attributes of assets that are created or discovered by the entrepreneur-owner. For instance, those who create or discover new knowledge have an incentive to use it directly because it is costly to transfer knowledge to others. In a well-functioning legal system, ownership of an asset normally implies that the courts will not interfere when an entrepreneur-owner captures the value of newly created or discovered attributes of an asset he owns. Consequently, the entrepreneur-owner can usually avoid costly negotiation with those who are affected his creation or discovery. This keeps the dissipation of value at bay. Of course, asset ownership itself provides a powerful incentive to create or discover new attributes, as ownership conveys the legally recognized (and at least partly enforced) right to the income of an asset, including the right to income from new attributes.²⁰ We next apply these ideas to the three classical issues in the theory of the firm: existence, boundaries, and internal organization.

The Existence of the Firm

Incomplete markets for judgment. Agents may realize rents from their human capital through three means: (1) selling labor services on market conditions, (2) entering into employment contracts, or (3) starting a firm. As Barzel (1987) argues, moral hazard implies that options (1) and (2) are often inefficient means of realizing rents. In other words, entrepreneurs know themselves to be good risks but are unable to communicate this to the market. For this reason, firms may emerge because the person whose services are the most difficult to measure (and therefore are most susceptible to moral hazard and

²⁰ Moreover, ownership simplifies the process of entrepreneurial arbitrage (Kirzner, 1973) – and hence helps to close pockets of ignorance in the market – by allowing entrepreneurs to acquire, in one transaction, a bundle of rights to attributes (i.e., a distinct asset). This means that the parties need not engage in costly bargaining over many rights to single attributes. The dissipation of value is thus minimized.

adverse selection) becomes an entrepreneur, employing and supervising other agents, and committing capital of his own to the venture, thus contributing a bond.

However, there are other reasons why the market may not be able to evaluate entrepreneurial services. For example, Kirzner (1979: 181) argues that “entrepreneurship reveals to the market what the market did not realize was available, or indeed, needed at all.” Casson (1982: 14) takes a more Schumpeterian position, arguing that “[t]he entrepreneur believes he is right, while everyone else is wrong. Thus the essence of entrepreneurship is being different – being different because one has a different perception of the situation” (see also Casson 1997). In this situation, non-contractibility arises because “[t]he decisive factors . . . are so largely on the inside of the person making the decision that the ‘instances’ are not amenable to objective description and external control” (Knight 1921: 251) (see also Foss 1993). Hence moral hazard is not the only important factor underlying non-contractibility. An agent may be unable to communicate his “vision” of a commercial experiment – a specific way of combining heterogeneous capital assets to serve future consumer wants – in such a way that other agents can assess its economic implications. In such a case, he cannot be an employee, but will instead start his own firm. The existence of the firm can thus be explained by a specific category of transaction costs, namely, those that close the market for entrepreneurial judgment.

Firms as controlled experiments. The idea of incomplete markets for judgment helps us understand the one-person firm. However, similar ideas may also be useful for understanding the multi-person firm; that is, it may help us understand the emergence of the employment contract.

Consider again the notion of capital (resource) heterogeneity. If capital is homogenous, the coordination of plans is relatively straightforward. In the real world of heterogeneous capital assets, production plans are much more difficult to coordinate. In the “production function view” of the firm, this problem is sidestepped by assuming that the assets controlled by the firm are already in their best uses. More realistically, however, full *ex ante* knowledge about the optimal sequence of tasks (for example) is not likely to exist.²¹ Given that the relationships among assets are generally unknown *ex ante*, some experimentation is necessary. First, one must isolate the system boundaries, that is, where the relevant relationships among assets are most likely to be. Second, the experimental process must be like a controlled experiment (or a sequence of such experiments) to isolate the system from outside disturbances. Third, there must be some sort of guidance for the experiment. This may take many forms, ranging from centrally provided instructions to negotiated agreements to shared understandings of where to begin experimenting, how to avoid overlapping experiments, how to revise the experiment in light of past results, and so on. The central problem is how this experimental process is best organized. Does the need for experimentation explain the

²¹ Strikingly, the problem of defining an optimal sequence of tasks in even relatively simple production systems may require more calculation capacity than is available in a supercomputer (Galloway 1996).

existence of the firm, or can such experimentation be organized efficiently through markets?

In a world of complete knowledge and zero transaction costs, all rights to all uses of all assets could be specified in contracts. By contrast, in a world of heterogeneous assets with attributes that are costly to measure and partly unforeseen, complete contracts cannot be drafted. The resulting set of incomplete contracts may constitute a firm, a process of coordination managed by the entrepreneur's central direction. If relationship-specific assets are involved, the holdup problem described above becomes a serious concern. (Asset specificity may itself be an outcome of an experimental process.) More specifically, as experimental activity provides information about how to optimize the system, assets will be increasingly specific in terms of time and location. Temporal and site specificity will tend to increase as assets become more efficiently coordinated. This provides one rationale for organizing the experiments inside firms, though not the only one. Firms may also be justified by problems associated with the dispersion of knowledge across agents. Production systems may exhibit multiple equilibria, and it may not be obvious how to coordinate on a particular equilibrium or even which equilibria are preferred.

In principle, an experimenting team could hire an outside consultant who guides the experimental activity, giving advice on the sequence of actions and asset uses, initiating the experiments, drawing the appropriate conclusions from each experiment, determining how these conclusions should influence further experimentation, and so on. However, such an arrangement is likely to run into serious bargaining costs. Under market contracting any team member can veto the advice provided by the consultant, and submitting to authority may be the least costly way to organize the experimental activity. "Authority" here means that the entrepreneur has the right to redefine and reallocate decision rights among team members and to sanction team members who do not use their decision rights efficiently. By possessing these rights, entrepreneur-managers can conduct experiments without continuously having to renegotiate contracts, saving bargaining and drafting costs. Such an arrangement then provides a setting for carrying out "controlled" experiments in which the entrepreneur-manager changes only some aspects of the relevant tasks to trace the effects of specific rearrangements of rights. Establishing these property rights is tantamount to forming a firm.

Changes in Firm Boundaries and Entrepreneurial Experimentation

The theory of firm boundaries is closely related to the theory of entrepreneurship, though it is not usually expressed in this fashion. Mergers, acquisitions, divestitures, and other reorganizations are best viewed as responses to a valuation discrepancy. Acquisition, for example, occurs when the value of an existing firm's assets is greater to an outside party than to its current owners. Put differently, merger can be a response to economies of scope, in that the value of the merging firms' assets combined exceeds their joint values separately.

New combinations of corporate assets can generate efficiencies by replacing poorly performing managers, creating operating synergies, or establishing internal capital markets. Like other business practices that do not conform to textbook models of competition, mergers, acquisitions, and financial restructurings have long been viewed with suspicion by some commentators and regulatory authorities. However, the academic literature clearly suggests that corporate restructurings do, on average, create value (Jarrell, Brickley, and Netter 1988; Andrade, Mitchell, and Stafford 2001). Given such benefits, why are many mergers later “reversed” in a divestiture, spin-off, or carve-out? Klein and Klein (2001) distinguish between two basic views. The first, which may be termed *empire building*, holds that entrenched managers make acquisitions primarily to increase their own power, prestige or control, producing negligible efficiency gains, and that acquisitions by manager-controlled firms are likely to be divested ex post. Most important, because the acquiring firm’s motives are suspect, such acquisitions are ex ante inefficient; neutral observers can predict, based on pre-merger characteristics, that these mergers are unlikely to be viable over time. (Moreover, by permitting these acquisitions, capital-market participants are also guilty of systematic error.)

A second view, which Klein and Klein (2001) term *entrepreneurial market process*, acknowledges that unprofitable acquisitions may be “mistakes” ex post, but argues that poor long-term performance does not indicate ex ante inefficiency. In the market-process perspective, a divestiture of previously acquired assets may mean simply that profit-seeking entrepreneurs have updated their forecasts of future conditions or otherwise learned from experience. As Mises (1949: 252) puts it, “the outcome of action is always uncertain. Action is always speculation.” Consequently, “the real entrepreneur is a speculator, a man eager to utilize his opinion about the future structure of the market for business operations promising profits. This specific anticipative understanding of the conditions of the uncertain future defies any rules and systematization” (p. 585, emphasis added).

Klein and Klein (2001) discuss empirical evidence that the long-term success or failure of corporate acquisitions cannot, in general, be predicted by measures of manager control or principal-agent problems. However, significantly higher rates of divestiture tend to follow mergers that occur in a cluster of mergers in the same industry. As argued by Mitchell and Mulherin (1996), Andrade, Mitchell, and Stafford (2001), and Andrade and Stafford (2004), mergers frequently occur in industry clusters, suggesting that mergers are driven in part by industry-specific factors, such as regulatory shocks. When an industry is regulated, deregulated, or re-regulated, economic calculation becomes more difficult, and entrepreneurial activity is hampered. It should not be surprising that poor long-term performance is more likely under those conditions.

This notion of entrepreneurial decision-making under uncertainty squares with recent theories of acquisitions as a form of experimentation (Mosakowski 1997; Boot, Milbourn, and Thakor 1999; Matsusaka, 2001). In these models, profit-seeking entrepreneurs can learn their own capabilities only by trying various combinations of activi-

ties, which could include diversifying into new industries. Firms may thus make diversifying acquisitions even if they know these acquisitions are likely to be reversed in a divestiture. This process generates information that is useful for revising entrepreneurial plans, and thus an acquisition strategy may be successful even if individual acquisitions are not. In these cases, the long-term viability of an acquisition may be systematically related to publicly observable, pre-merger characteristics associated with experimentation, but not characteristics associated with managerial discretion.

Internal Organization

Productive and destructive entrepreneurship. In much of the entrepreneurship literature, there is a general, though usually implicit claim that all entrepreneurial activity is socially beneficial (Mises 1949; Kirzner 1973). However, as Baumol (1990) and Holcombe (2002) point out, entrepreneurship may be socially harmful if it takes the form of rent-seeking, attempting to influence governments (or management) to redistribute income but in the process consuming resources and bringing about a social loss. It is therefore necessary to introduce a distinction between productive and destructive entrepreneurship.

When agents expend effort discovering new attributes and taking control over these in such a way that joint surplus (net social benefit) is reduced, we shall speak of “destructive entrepreneurship.” Thus, discovering new forms of moral hazard (Holmström 1982), creating hold-ups (Williamson 1996), and inventing new ways of engaging in rent-seeking activities relative to government (Baumol 1990, Holcombe 2002) are examples of destructive entrepreneurship in the sense that these represent the discovery of new attributes that decrease joint surplus. “Productive entrepreneurship” refers to the creation or discovery of new attributes leading to an increase in joint surplus. For example, a franchisee may discover new local tastes that in turn may form the basis for new products for the entire chain; an employee may figure out better uses of production assets and communicate this to the TQM team of which he is a member; a CEO may formulate a new business concept; etc. In the following we sketch how this distinction provides a way of developing an entrepreneurial approach to internal organization. Note that we here use the term “entrepreneurship” more broadly than before, referring not only to decisions made by resource owners (entrepreneurship in the strict sense), but also to decisions made by employees, acting as proxy decision-makers for the resource owners.

Fundamental tradeoffs in internal organization. The first such problem concerns the control of destructive entrepreneurial activities. For example, firms may delimit employees’ use of telephone and internet services by closely specifying their use rights over the relevant assets, instructing them to act in a proper manner towards customers and to exercise care when operating the firm’s equipment, and the like. However, firms are unlikely to succeed entirely in their attempt to curb such activities. One reason for this is the costs of monitoring employees. Another reason is that employees may creatively circumvent constraints; for example, they may invent ways of covering their

(mis-)use of the internet. Although firms may know that such destructive entrepreneurship takes place, they may prefer not to try to constrain it further. This is because the various constraints that firms impose on employees (or, more generally, that contracting partners impose on each other) to curb destructive entrepreneurship may have the unwanted side effect that productive entrepreneurship is stifled (see Kirzner, 1985).

More generally, imposing (too many) constraints on employees may reduce their propensity to create or discover new attributes of productive assets. At any rate, many firms increasingly appear to operate on the presumption that beneficial effects may be produced by reducing constraints on employees in various dimensions. For example, firms such as 3M allocate time to research employees that they are basically free to use in almost any way they see fit in the hope that this will produce serendipitous discoveries. Many consulting firms do something similar. Of course, industrial firms have long known that employees with many decision rights – researchers, for example – must be monitored and constrained in different, and typically much looser, ways than those employees charged only with routine tasks. More broadly, the increasing emphasis on “empowerment” during the last few decades reflects a realization that employees derive a benefit from controlling aspects of their job situation. Moreover, the total quality movement emphasizes that delegating various rights to employees motivates them to find new ways to increase the mean and reduce the variance of quality (Jensen and Wruck, 1994). To the extent that such activities increase joint surplus, they represent productive entrepreneurship.

Stimulating the productive creation and discovery of new attributes by relaxing constraints on employees results in principal-agent relationships that are less completely specified. This is not simply a matter of delegation, or transferring specific decision rights, but rather giving agents opportunities to exercise their own, often far reaching, judgments. However, as we have seen, this also permits potentially destructive entrepreneurship. Managing the tradeoff between productive and destructive entrepreneurship thus becomes a critical management task.

Choosing efficient tradeoffs. In this context, asset ownership is important because it gives entrepreneurs the right to define contractual constraints, that is, to choose their own preferred tradeoffs. Briefly stated, ownership allows the employer-entrepreneur’s preferred degree of contractual incompleteness – and therefore a certain combination of productive and destructive entrepreneurship – to be implemented at low cost. This function of ownership is particularly important in a dynamic market process, the kind stressed by Knight (in the later chapters of Knight, 1921) and the Austrians (Hayek, 1948; Kirzner, 1973; Littlechild 1986). In such a context, an ongoing process of judgmental decision making requires contractual constraints to address the changing tradeoffs between productive and destructive entrepreneurship inside the firm. The power conferred by ownership allows the employer-entrepreneur to do this at low cost (for a fuller analysis, see Foss and Foss, 2002).

Conclusion

The theory of entrepreneurship and the economic theory of the firm thus have much to learn from each other. A good theory of entrepreneurship should explain the conditions under which entrepreneurship takes place: Does the entrepreneur need a firm? We have argued that the concept of entrepreneurship as judgment provides the clearest link between entrepreneurship, asset ownership, and economic organization. Similarly, the economic theory of the firm can be improved substantially by taking seriously the essential heterogeneity of capital goods and the subsequent need for entrepreneurial experimentation.

Will these insights be incorporated into the economic theory of the firm? We are optimistic, but guardedly so. Because these concepts lie fundamentally outside the standard constrained optimization framework, they are inherently difficult to model mathematically. Modern economists have difficulty appreciating ideas that are not expressed in this familiar language. Indeed, most recent theoretical advances in the economic theory of the firm have been developed within the more formal framework associated with Grossman, Hart, and Moore, not the more “open” framework associated with Williamson.²² Relaxing this constraint may lead to considerable advances in economists’ understanding of the firm.

²² Bajari and Tadelis (2001) is a prominent exception. See Foss (1994) for the case that Williamson’s work represents an ontologically “open” interpretation of Coase, distinguished in this way from other developments of the Coasian tradition.

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