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ENTREPRENEURSHIP AND THE ECONOMICS OF THE FIRM

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ENTREPRENEURSHIP AND THE ECONOMICS OF THE FIRM

Abstract

the study of entrepreneurship and the study of economic organizing lack contact. In fact, the modern theory of the firm virtually ignores entrepreneurship, while the literature on entrepreneurship often sees little value in the economic theory of the firm. In contrast, we argue in this chapter that entrepreneurship theory and the theory of the firm can be usefully integrated, and that doing so would improve both bodies of theory. Adding the entrepreneur to the theory of the firm provides a dynamic view that the overly static analysis of firm organizing cannot support. Moreover, adding the firm to the study of the entrepreneur provides important clues to how we can understand entrepreneurship.

INTRODUCTION

What is the relationship between entrepreneurs and business firms? Do entrepreneurs need firms to carry out their function, and do firms need entrepreneurs to survive in the competitive market process? What exactly do entrepreneurs do inside firms – establish, finance, direct, control, operate? Does the entrepreneur disappear from stage once the firm is founded, handing things off to professional managers who do not merit the label “entrepreneur”? These questions strike simultaneously at the hearts of microeconomics and management research in entrepreneurship (cf. Shane and Venkataraman 2000). And yet the study of entrepreneurship and the study of economic organizing lack contact. In fact, the modern theory of the firm virtually ignores entrepreneurship, while the literature on entrepreneurship often sees little value in the economic theory of the firm (N. J. Foss and Klein 2005).

This divide emerged as microeconomic analysis took important steps toward increased scientific rigor, which in effect left no room for dynamic elements such as entrepreneurs or entrepreneurship. The economic theory of the firm was subsumed into neoclassical price theory (O'Brien 1984) and reformulated using game theory and the economics of information (N. J. Foss and Klein 2011). As a result, modern contributions to the theory of the firm (Williamson 1975; 1985; 1996; Milgrom and Roberts 1992; Hart 1995) focus on solving given optimization problems and are therefore typically static and “closed.” They tend to avoid open-ended questions about where the problems come from or what is the origin of the firm. Indeed, the question of firm emergence in the market place is almost completely left out of the theoretical discourse on the firm.

In contrast, we argue in this chapter that entrepreneurship theory and the theory of the firm can be usefully integrated, and that doing so would improve both bodies of theory. Adding the entrepreneur to the theory of the firm provides a dynamic view that the overly static analysis of firm

organizing cannot support. Moreover, adding the firm to the study of the entrepreneur provides important clues to how we can understand entrepreneurship.

We begin by briefly surveying the study of entrepreneurship in the economics and management literatures and ask to what extent the entrepreneur, characterizes in the most common ways, needs a firm. We focus on entrepreneurship as *judgment*, a view we trace to Richard Cantillon, Frank Knight, and Ludwig von Mises and has a direct and natural link to the theory of the firm: the entrepreneur needs a firm because judgment cannot be purchased on the market. Next, we review the main themes in the modern theory of the firm and strategic entrepreneurship, and show how entrepreneurship as judgment illuminates these issues in novel and theoretically useful ways.

In the concluding parts of the chapter, we point to the fact that resources, in contrast to the common treatment in economic theory, are fundamentally heterogeneous (Lachmann [1956] 1978) and therefore that resource uses are not simply data but are created as entrepreneurs envision new ways of using assets to produce goods. We make the further case that asset ownership through a firm allows the entrepreneur to experiment with novel combinations of these heterogeneous assets and thus provides a vehicle through which the entrepreneur can attempt to realize imagined production structures. From this approach a number of unconventional insights emerge, which may prove useful in further theorizing on the firm and entrepreneurship.

ENTREPRENEURSHIP: OUTCOME OR ACTION?

Entrepreneurship comes in many shapes and forms, all of which are not relevant to or can usefully be linked to the theory of the firm. We find it useful to distinguish between theories or approaches that define entrepreneurship as an *outcome* or a phenomenon (self-employment, startup companies) and those that see it as a *way of acting or thinking* (creativity, innovation, alertness, judgment, adaptation) (cf. Klein 2008; Casson 1982; Knight 1942). Some “outcome” approaches

deal with firms—e.g., what is the ratio of small ones to large ones in an industry or economy—but the decision to limit “entrepreneurial” behavior to small or new firms is unnecessarily restrictive, and not closely connected to the classic contributions to the economic theory of entrepreneurship associated with Knight, Schumpeter, Kirzner, and others. “Action” approaches, what Klein (2008) calls “functional” concepts of entrepreneurship, are more useful in linking to the theory of the firm.

The economic function of the entrepreneur has been characterized in various ways: judgment, innovation, alertness, adaptation, coordination, and so on. Whereas all these functional approaches are interesting and have advantages, the notion of entrepreneurship as judgment has particularly important implications for the analysis of the business firm. Schumpeter’s idea of entrepreneurship as innovation ([1911] 1934) helps illuminate the process by which industries and economies expand and contract, but Schumpeter treats 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 largely independent of the firm. Kirzner’s (1973; 1979; 1992; 2009) conception of entrepreneurship as “alertness” to or the discovery of profit opportunities, building on Hayek’s (1978) view of competition as a “discovery procedure,” attempts to elucidate the equilibrating character of the market process. Like Schumpeter’s entrepreneur, however, Kirzner’s discoverer does not work with firms; the Kirznerian entrepreneur does not own capital and is not subject to losses, and hence does not need a firm to exercise his function in the economy (N. J. Foss and Klein forthcoming). The coordinating entrepreneur communicates “mental models” of reality (Casson 2000) to be adopted by others, thereby creating a shared vision through which production is coordinated. This view of entrepreneurship as “cognitive leadership” (Witt 1998; 1999) focuses almost exclusively on human resources and firm organizing relies on establishing a tacit, shared framework of goals to govern relationships among members of the entrepreneur’s team. Even though charismatic leadership may be seen as a coordinating force, it is not clear why such is more

entrepreneurial than other kinds of leadership or mundane managerial tasks. It is furthermore unclear in what sense the charismatic leader is primarily an economic agent and how sharing of a vision characterizes a firm.

ENTREPRENEURSHIP AS JUDGMENT

In contrast, the view of entrepreneurship as consisting of judgmental decision-making under conditions of uncertainty (Casson 1982; Langlois and Cosgel 1993; N. J. Foss and Klein 2005; cf. Cantillon [1755] 2010) maps more naturally into theories of business strategy and organization. Judgment refers to business decision-making when the range of possible future outcomes, as well as the likelihood of individual outcomes, is unknown (what Knight ([1921] 1985) terms uncertainty, rather than mere probabilistic risk). Uncertainty bearing is the entrepreneur's *raison d'être*. As Mises (1949, p. 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" (1949, p. 585).

Judgment is distinct from boldness, innovation, alertness, and leadership, and must be exercised in mundane circumstances, for ongoing operations as well as new ventures. While alertness tends to be passive, and 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, p. 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.

While the view of entrepreneurship as judgment appears in many writers, it is most often associated with Knight ([1921] 1985), who introduces the concept to explain profit and the firm through the existence of uncertainty. For Knight, firm organization, profit, and the entrepreneur are closely related; they arise as an embodiment, a result, and a cause, respectively, of commercial experimentation (Demsetz 1988a). Businessmen use their judgment, a learned trait with a large tacit component, to form estimates of future events in situations where there is no agreement or idea at all on probabilities of occurrence. Entrepreneurship, the exercise of judgmental decision-making, therefore cannot be assessed in terms of its marginal product and cannot be paid a wage, which means there can be no market for judgment. 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. The lack of basis for market pricing suggests that exercising judgment requires the person with judgment to start a firm. Consequently, judgment implies asset ownership. Judgmental decision-making is ultimately decision-making about the allocation and employment of resources; a decision-maker without capital goods cannot, to Knight, be an entrepreneur. Indeed, entrepreneurial decision making without asset ownership constitute “mere parlor games until the money is obtained and committed to the projects” (Rothbard [1985] 1997, p. 283).

There is therefore an obvious link between entrepreneurship and the theory of the firm, particularly those that define asset ownership as a crucial ingredient of firm organization (Hart 1995; Williamson 1996). The firm, in this sense, is the entrepreneur and the alienable assets he owns and ultimately controls—structured, specialized, and combined to attain the entrepreneur’s imagined end. The theory of the firm is essentially a theory of how the entrepreneur exercises his

judgmental decision-making—what combinations of assets he seeks to acquire, what (proximate) decisions he delegates to subordinates, how he provides incentives and employ monitoring to see that his assets are used consistently with his judgments, and so on.

DOES THE FIRM NEED AN ENTREPRENEUR?

Some concepts of entrepreneurship, and especially entrepreneurship as judgmental decision making under uncertainty, have implications for resource ownership, and consequently for the formation and organization of firms. But this does not suggest how entrepreneurship is best incorporated into the theory of the firm, and it also does not provide sufficient clues for the role of the entrepreneur—or whether the entrepreneur is necessary for economic organization. To formulate a theoretically viable relationship between the firm and entrepreneurship, we need to look more closely to the various established theories of the firm and explore how they explain what constitutes a firm and how firm organizing fosters decision making.

As modern, “neoclassical” economics emerged in the mid-to-late twentieth century, the firm was given “an increasingly passive role” (McNulty 1984, p. 240). With the emphasis on formal, mathematical modeling, the dynamic aspects of markets that are most closely related to entrepreneurship were largely assumed away (O'Brien 1984) and the firm became modeled simply as a production function (Williamson 1985; Langlois and Foss 1999). In this simplified model of the market, all firms are always on their production possibilities frontiers and always make optimal choices of their input combinations and output levels. There can be no room for entrepreneurship since the firm is but a fully transparent production possibility set and therefore any firm can do what any other firm does (Demsetz 1988b).

The inadequacy of the traditional theory of the firm explains much of the recent interest in the many theories spawned by Coase's landmark 1937 article, "The Nature of the Firm." In his article, Coase introduced a fundamentally new way to think about the firm and argued that firms have no reason to exist in the world of neoclassical price theory. Because we observe firms in real life, he reasoned, there must be a "cost to using the price mechanism" (1937, p. 390). Within the firm, the entrepreneur may be able to reduce these "transaction costs" by coordinating productive activities himself. However, internal organization gives rise to other kinds of transaction costs due to 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 (Coase 1937; 1988a). Most modern theories of the firm are Coasean in the sense that they adhere to the program established by Coase, even though their terminology, focus, and specific insights may differ.

Coase makes use of the term "entrepreneur" to denote the decision-maker in a firm, but does not share the view of entrepreneurship discussed above. Rather, the Coasean 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 1989); he exercises authority through which he "directs" labor factors to "reproduce distribution of factors under atomistic competition within the business unit" (Coase 1988b, p. 4). In this sense, the Coasean entrepreneur is an authoritative imitator in a semi-static setting rather than a judgmental decision-maker as in Knight's approach.

The firm in modern organizational economics is to a large extent Coasean in that it is viewed as a contractual entity for which the economizing on transaction costs provides the best explanation to its existence, boundaries, and internal organization. Whereas the body of literature addresses all of these three issues, none of the theories in modern organizational economics

provides a unified framework incorporating transaction costs of the same kind (see e.g. N. J. Foss 1997, p. 175; N. J. Foss and Klein 2008, p. 426; cf. Garrouste and Saussier 2008, p. 23). 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 (Jensen and Meckling 1976; Holmström and Milgrom 1991; 1994) and team theory (Alchian and Demsetz 1972; Marschak and Radner 1972) are mainly relevant for understanding internal organization, the transaction cost (Williamson 1975; 1985) and property rights approaches (Grossman and Hart 1986; Hart and Moore 1990; Hart 1995) are designed to explain firm boundaries. Their emphasis on different kinds of transaction costs leads to contractual imperfection, and therefore to economic outcomes inferior to the full-information, zero-transaction-cost ideal, in different ways. While principal-agent theory emphasizes costs of monitoring contractual relationships in light of potential moral hazard, the transaction cost and property rights approaches emphasize the costs of writing (complete) contracts and the costs of adjusting to unanticipated contingencies, respectively. Only transaction cost economics and the property rights approach are conventionally considered theories of the firm, strictly speaking, since the others do not explain the boundaries of the firm in terms of asset ownership (Hart 1995).

Following the former (Williamson 1985; 1996), organizational economics places particular emphasis on specific (or highly complementary) assets in attempting to explain the boundaries of the firm. High asset specificity means that there is a great difference in market value between an asset's present and alternative uses, which suggests investments in such expose agents to potential hazard: once investments are made and contracts are signed, unanticipated changes in circumstances can give rise to costly renegotiation. With the value of the asset being specific to the particular transaction, one party can be "held up" by the other party attempting to extract quasi-rents through threatening to pull out of the arrangement, which would greatly reduce the value of the

asset. The parties to the transaction may choose to vertically integrate the transaction to eliminate such adversarial interests. Less extreme options include so-called “hybrid” arrangements: long-term contracts, partial ownership, or agreements for both parties to invest in offsetting relationship-specific investments (Ménard 2010). Overall, parties choose a particular governance structure in order to best control the underinvestment problem, given the particulars of the relationship.

There are many ways in which entrepreneurship, and especially entrepreneurship as judgment, can be incorporated in modern organizational economics. The emphasis put on asset ownership, as well as incomplete contracting, when explaining firm organization accords well with Knight’s ([1921] 1985) views, and theories of decision-making under asymmetric information illustrate the distinctiveness of entrepreneurship. Nevertheless, the modern economics of organization is still fully rooted in the neoclassical theoretical framework and has only grafted a super-structure of asymmetric information, transaction costs, and the like on top of the neoclassical theory of production (see e.g. Langlois and Foss 1999; N. J. Foss 1996). 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 (N. J. Foss 2003) but are not themselves explained. Still, key insights from organizational economics and the concept of entrepreneurial judgment may be usefully joined into a more complete theory of economic organization.

HETEROGENEOUS ASSETS AND ENTREPRENEURIAL OWNERSHIP

The primary function of the entrepreneur is to choose among the various combinations of inputs suitable for producing particular goods according to his planned structure of production, and attempt to realize his imagined solution to perceived problems through establishing still unrealized (and unheard of) combinations of yet-to-be-created highly specialized factors and assets (Bylund

2011). In the real world rather than the stylized neoclassical view of the market, this task consists primarily of choosing among combinations of specialized labor factors and heterogeneous capital assets whose “combinations ... will be ever changing, will be dissolved and re-formed” (Lachmann [1956] 1978, p. 13) and guiding these factors toward wanted degrees and types of specialization. Hence, the entrepreneurial problem is extremely complicated and always subject to a high degree of uncertainty (cf. Alvarez and Barney 2005).

Heterogeneous assets can usefully be analyzed in terms of attributes (Barzel 1997) or specificities (Lachmann [1956] 1978), i.e. their characteristics, functions, possible uses, etc., as perceived by the entrepreneur. Heterogeneity exists to the extent that the assets have different, and different levels of, valued attributes, and may vary over time, even for a particular asset (cf. K. Foss et al. 2007). In a world of “Knightian” uncertainty, entrepreneurs are unlikely to know all relevant attributes of all assets when production decisions are made and they also cannot with certainty forecast future attributes of an asset. The latter must be discovered as assets are used in production, which means future attributes are “created” as entrepreneurs envision new ways of using assets to produce goods.

The creation of attributes constitutes an important entrepreneurial function and suggests a distinct role for asset ownership. Since property rights are primarily held over attributes (Barzel 1997; cf. Kim and Mahoney 2007), the role for asset ownership results from gaining property rights to bundles of existing and future attributes. Ownership emerges as a low-cost means of allocating the rights to attributes of assets that are created or discovered by the entrepreneur-owner. Of course, asset ownership itself also provides a powerful incentive to create or discover new attributes, suggesting new opportunities for profit (cf. Alvarez and Barney 2007a), 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.

IMPLICATIONS FOR THE THEORY OF THE FIRM

As was previously mentioned, there can be only incomplete markets for judgment due to the partial tacitness of this quality. 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 (cf. Alvarez and Barney 2004). However, there are reasons why the market may not be able to evaluate entrepreneurial services in addition to measurement difficulties and the moral hazard and adverse selection problems that follow. For instance, Kirzner (1979, p. 181) argues that “entrepreneurship reveals to the market what the market did not realize was available” while Casson (1982, p. 14) argues that “the essence of entrepreneurship is being different” especially in terms of “perception of the situation” (cf. Casson 1997). Alvarez and Barney (2005; 2007b; cf. Hitt et al. 2001) take a different approach that builds on both Kirzner and Casson, conceiving entrepreneurs as competing for the appropriation of profit opportunities, both discovered and “created,” which often involves creating firms. In these kinds of approaches, 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] 1985, p. 251; cf. N. J. Foss 1993). 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.

While this suggests a rationale for self-employment as compared to employment, i.e. the creation of one-person firms, we can discern reasons for the emergence of the employment contract

due to capital (resource) heterogeneity. The entrepreneur acts under uncertainty in terms of the outcome of combining known attributes of heterogeneous capital assets but also regarding how to make best use of attributes discovered in the future. Under such circumstances, knowledge of the optimal sequence or execution of tasks is not likely to exist. Therefore, smaller scale entrepreneurial judgment is required on the task level as well as in the relations between tasks in order to continuously make adjustments to improve productivity and make full use of discovered attributes.

Given the limits of incomplete market contracting, the entrepreneur is better off guiding the continuously evolving system while delegating the detailed experimenting within and between specialized tasks in the established structure of production to individual members of a team of producers. Establishing market contracts in such a situation with measurement difficulties would allow any team member hold-up opportunities and the possibility to veto the guidance from the entrepreneur, thereby risking the profitability of the structure. In other words, in an ever-changing world with heterogeneous capital assets and subject to Knightian uncertainty the entrepreneur is better off creating a trusted and specialized team within the boundaries of the firm. These team members can then exercise derived judgment as proxy-entrepreneurs (K. Foss, Foss and Klein 2007) to experiment with individual tasks in order to optimize productivity while adhering to the ends of the overall structure (for an alternative view, see e.g. Hsieh, Nickerson and Zenger 2007).

The entrepreneur remains in control of the firm through asset ownership, incomplete or open-ended contracting with team members through which they align their skills and effort to the entrepreneur's ends, and superior judgment regarding (and knowledge of) the overall structure of production and the particular ends to be achieved through the imagined and attempted production process. The firm can therefore be seen as a purposefully created structure that enables the entrepreneur to realize an imagined production process that is still inexistent in the market. In fact,

as Bylund (2011) argues, the firm can be seen as an “island” of super-utilized division of labor that cannot be established in the market through contracting due to incompatibilities with the overall market structure. Integrating the yet-to-be-realized production process in a firm is a means for the entrepreneur to artificially make real his vision for a future market structure; within the firm, the increased density of factors allows them to specialize and co-specialize to the entrepreneur’s imagined process in ways and to an extent that is literally impossible outside of the firm.

Furthermore, the firm’s boundaries are closely related to the theory of entrepreneurship. Mergers, acquisitions, divestitures, and other reorganizations are best viewed as responses to valuation discrepancies that are perceived, subjectively, by entrepreneurs. One implication is that unprofitable boundary changes should not be viewed as “mistakes,” subject to tight regulatory scrutiny (Klein and Klein 2001). A divestiture of previously acquired assets, for example, may mean simply that profit-seeking entrepreneurs have updated their forecasts of future conditions or otherwise learned from experience. Boundary changes can be viewed as a form of organizational experimentation (Mosakowski 1997; Boot, Milbourn and Thakor 1999; Matsusaka 2001) in which entrepreneurs seek to discover their own capabilities by trying various combinations of activities, which could include diversifying into new industries. However, while the long-term success or failure of acquisitions cannot, in general, be predicted by measures of manager control or principal-agent problems (Klein and Klein 2001), significantly higher rates of divestiture tend to occur in a clusters of mergers (see e.g. Mitchell and Mulherin 1996; Andrade, Mitchell and Stafford 2001; Andrade and Stafford 2004). As suggested in the literature, mergers may be driven in part by industry-specific factors, such as regulatory shocks, which means that when regulation of an industry changes, economic calculation becomes more difficult, and entrepreneurial activity is hampered.

Entrepreneurs also experiment with internal organization..Whereas entrepreneurship activity is usually described as socially beneficial (Mises 1949; Kirzner 1973), some forms may be “destructive” (Baumol 1990; Holcombe 2002; cf. Coyne, Sobel and Dove 2010). Entrepreneurship may be socially harmful if it consumes resources and brings about a social loss; 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 contrast, “productive” entrepreneurship refers to the creation or discovery of new attributes leading to an increase in joint surplus. The firm and the entrepreneur may be victimized by employees engaging in destructive entrepreneurial activities. Therefore, the internal organization of the firm should aim to control destructive and support productive entrepreneurial activities (Foss, Foss, and Klein, 2007).

To control destructive entrepreneurship, the firm should be organized to balance the costs of destructive entrepreneurship and costs of monitoring and curbing such behavior, as employees may attempt to creatively circumvent constraints thereby imposing extra costs on the organization. Imposed constraints may have the unwanted side effect that productive entrepreneurship is stifled (see Kirzner 1985), and, more generally, imposing (too many) constraints on employees may reduce their propensity to create or discover new attributes of productive assets. Relaxing such constraints in order to stimulate productive creation and discovery of new attributes may result in less completely specified principal-agent relationships, thereby giving agents opportunities to exercise their own, often far reaching, judgments. This may also permit potentially destructive entrepreneurship and managing the tradeoff between productive and destructive entrepreneurship becomes a critical management task.

In this context, asset ownership is important through giving entrepreneurs the right 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 [1921] 1985) 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 K. Foss and Foss 2002).

CONCLUSION

The theory of entrepreneurship and the economic theory of the firm thus have much to learn from each other. 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.

However, because these concepts lie fundamentally outside the standard constrained optimization framework, they are inherently difficult to model mathematically. Since modern economists have difficulty appreciating ideas that are not expressed in this familiar language, it may prove difficult to get the aforementioned insights incorporated into the economic theory of the firm. However, recent theoretical advances in strategic entrepreneurship and attempts to bridge the divide through studying entrepreneurial firms make us cautiously optimistic. We may see considerable advances in economists' understanding of the firm in a not too distant future.

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