

The Organizational Economics of Organizational Capability and Heterogeneity: A Research Agenda

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Abstract

For decades, the literatures on firm capabilities and organizational economics have been at odds with each other, specifically relative to explaining organizational boundaries and heterogeneity. We briefly trace the history of the relationship between the capabilities literature and organizational economics and point to the dominance of a “capabilities first” logic in this relationship. We argue that capabilities considerations are inherently intertwined with questions about organizational boundaries and internal organization, and use this point to respond to the prevalent “capabilities first” logic. We offer an integrative research agenda that focuses, first, on the governance of capabilities and, second, on the capability of governance.

Key words: Organizational economics, theory of the firm, heterogeneity, capabilities.

JEL Codes: D23, D86, L14

INTRODUCTION

The dialogue between the firm capabilities literature and organizational economics has a long history in management research. The conversation has proceeded for over forty years, through several stages, and has involved truly fundamental issues, such as the nature and implications of firm heterogeneity, the role of dynamics, behavioral assumptions, and the explanatory status of the economic notion of efficiency. The discussion has been lop-sided, however, for it has largely involved proponents of the capabilities view critically discussing central ideas in organizational economics. Organizational economists have been considerably less active in discussing the capabilities view from their perspective, or in defending organizational economics against critique. Much has been learned in the process, and some positions have prevailed, while others have been abandoned. For example, much discussion in the 1990s centered on the assumption of opportunism (Williamson, 1985). Capabilities theorists argued in favor of an “opportunism-free” theory of the firm—an idea that seems to have been abandoned by contemporary proponents of capabilities ideas.

The most contested terrain of this discussion pertains to the theory of the firm (and, per implication, other kinds of economic organization, such as markets and hybrids). Much of the critical discussion of organizational economics has its origin in strategic management, and in this literature, the theory of the firm has assumed a meaning beyond its Coasean origin (Coase, 1937). Whereas organizational economics has taken economic organization, or the organization of activities and transactions across alternative governance structures and mechanisms, as its *explanandum* phenomenon, much of the strategic management discussion of governance has assumed that firm heterogeneity is an additional *explanandum*, on par with governance. The main

point of discussion has concerned the nature of the mechanisms that underlie the pattern of observed economic organization—for example, what are the explanatory roles of differential capabilities and the behavioral assumption of opportunism—and whether firm heterogeneity and the more traditional *explananda* of the theory of the firm are more intricately linked than suggested by organizational economics.

In this introductory essay we briefly survey the extant discussion and suggest some ways forward. We argue that to date the discussion has been lopsided—hardly qualifying as a real debate—and that a reorientation is necessary. Specifically, the terms of the discussion have largely been defined by capabilities theorists. Part of the explanation for this dominance is that capability theorists have had a rhetorical advantage. They have been armed with a seemingly strong argument, tacitly accepted by some organizational economists (cf. Williamson, 1999), namely that capabilities ideas, rather than organizational economics, hold the key to understanding organizational capabilities. Per implication, organizational economics has seemingly had little to say directly about organizational heterogeneity, such as the dispersion of returns across firms in an industry. Moreover, to the extent that such heterogeneity matters to economic organization—notably, the boundaries of firms—the capabilities view claims to hold explanatory primacy. Thus there has been a mutual acceptance of what could be called a “capabilities first” heuristic in much of the discussion.

While the relative vigilance of capabilities theorists has arguably benefited the development of both approaches, it has also led to certain key issues not being addressed, or not being addressed in terms of relevant theories. We argue that the time is ripe for reconsidering a number of these key issues, in particular, the underlying notion that organizational economics is silent on issues of organizational capability and heterogeneity. We show that this presumed silence rests on a

misreading of organizational economics: while it is true that organizational economics was not (directly) designed to address and explain organizational heterogeneity, this does not imply that the theory is and must remain silent about such heterogeneity (Argyres 2011). In fact, we discuss a number of ways in which organizational economics is quite centrally focused on explaining organizational heterogeneity. Specifically, we argue that organizational economics provides guidance around how organizational design and boundaries facilitate the formation of knowledge, insight, and learning that are central to the heterogeneity of firms. We also demonstrate how efficient governance can itself be a source of competitive heterogeneity. We thus call on organizational economists to actively and vigorously enter the discussion, turning something closer to a monologue into real dialogue.

EXTANT WORK ON CAPABILITIES AND TRANSACTION COSTS:

“CAPABILITIES FIRST”

An Evolving Critique

The discussion and debate about capabilities and boundaries has evolved over the past four decades. The first contribution in the relevant literature to use the term “capabilities” in the context of understanding strategy and organization is Richardson (1972). Drawing on Penrose (1959), Richardson (1972: 888) argued that to explain the “division of labour between firm and market” (i.e. the boundary of the firm) requires that we place the “elements of organisation, knowledge, experience and skills” center stage. In a footnote, he mentioned Coase’s (1937) explanation of boundary choice, in terms of the relative costs of using firms versus markets, and added that his explanation “is not inconsistent ... but might be taken as giving content to the notion of this relative cost by specifying the factors that affect it” (Richardson, 1972: p.888n).

Partly because the idea of firm-specific capabilities did not fully catch on in management research (few mainstream economists have been interested in firm capabilities) until the end of the 1980s, the discussion lay dormant for almost two decades. However, it was revitalized in 1988 in important contributions by Demsetz (1988) and Winter (1988). Both argued that the economics of the firm neglected firm-specific knowledge and how it shapes the boundaries of the firm. The emphasis of Demsetz (1988) was on how economizing with knowledge helps explain authority and firm boundaries, whereas Winter's (1988) main emphasis was on the path-dependency implied by firm-specificity of productive knowledge. Perhaps impressed by such arguments, agency theorists Paul Milgrom and John Roberts (1988: 450) declared that

... transaction costs theory has been made to carry too much of the weight of explanation in the theory of organizations. We expect competing and complementary theories to emerge—theories that are founded on economizing on bounded rationality and that pay more attention to changing technology and to evolutionary considerations.

For some time the emphasis was placed on “competing” rather than on “complementary” explanations. Thus, papers by Kogut and Zander (1992, 1996), Madhok (1996), Conner and Prahalad (1996) and others aggressively argued that economic organization was fully explainable in capabilities terms, and that the notion of opportunism (or moral hazard, or misaligned incentives in general) is entirely unnecessary (or even harmful) in explaining governance outcomes.

This position seems to have more recently been abandoned in favor of an argument that capabilities ideas and organizational economics are complementary in what may be called an “additive” manner. In such an understanding, for example, capabilities theory assists managers in understanding which resources they require (to position and compete in certain ways), while organizational economics informs them about the sourcing and organization of such resources. Such an understanding of the relation between the two perspectives is explicit or implicit in much work over the last decade or so (e.g., Argyres, 1996; Silverman, 1999; Nickerson and Zenger, 2004).

This additive perspective has been given some legitimacy among organizational economics by Oliver Williamson's (1999: 1103) guidance: "Rather, therefore, than ask the question 'What is the best generic mode (market, hybrid, firm, or bureau) to organize X?', which is the traditional transaction cost query, the question to be put instead is 'How should firm A—which has pre-existing strengths and weaknesses (core competences and disabilities)—organize X?'" The article by Lo, Frias and Ghosh (this issue) pursues this approach to combining capabilities considerations with transaction cost economics. They find for example, that the strength of firms' pre-existing capabilities affects governance—in this case the pricing formats in the contracts they study.

Arguments that stress this additive relationship between these theories are often made in management research (e.g., Mahoney and Pandian, 1992). Note, however, that accepting the argument that these theories are additive in nature means giving up theory development at the intersection of capabilities theory and organizational economics. Specifically, it is a denial of a meaningful *shared* domain of application. Instead, the additive nature of the respective theories suggests that they address different *explanandum*, heterogeneity and boundaries respectively, and thus they are not really theoretical rivals (Foss and Foss, 2000; Masten, 1993).

Of course, some work has explored relations of what may be called "complementarity proper" in greater detail. Such work recognizes a meaningful zone of theoretical overlap between the capabilities view and organizational economics. Langlois (1988, 1992), for instance, argued that transaction costs may moderate the link between the capability distribution in an industry and vertical scope. Specifically, he argued that under dynamic conditions firms may be unable to access the services they seek, because suppliers may be unable to understand what exactly is required of them. Such communication costs (Langlois calls them "dynamic transaction costs") may drive boundary decisions in dynamic environments (also see Teece, 1977), while more conventional

transaction costs drive boundary decisions in more static environments. In contrast to earlier contributions, this complementary perspective recognizes that the theories are not rivals, but rather each theory highlights different elements of the same theoretical landscape (Argyres and Zenger, forthcoming). For example, as we discuss below, Mayer and Argyres (2004) and Argyres and Mayer (2007) conceptualize transacting with contracts as a learned capability. Along these lines, Jacobides and Winter (2005) build a model of industry evolution in which they model the co-evolution of transactions and capabilities. However, in this work, as indeed in the rest of the literature on capabilities and transaction costs, capabilities are granted explanatory primacy (also see Jacobides and Winter, this issue). Thus, in this literature capabilities and learning directly influence governance, but the alternative path is not considered.

Capabilities First: Some Concerns

As noted above, but for a few exceptions (e.g. Foss, 1996; Foss and Foss, 2000, 2008; Argyres and Zenger, forthcoming), the literature in organizational economics and, of course, firm capabilities assumes the explanatory primacy of capabilities in explaining heterogeneity. This is odd because, as Williamson (1999) detailed, organizational economics seems considerably more advanced in terms of its definitions of key concepts. Whereas notions of asset specificity or complementarity are well defined in organizational economics, critics of the capabilities perspective contend that no clean definition of capabilities exists. And yet, even after pointing to the differences in terms of theoretical maturity between organizational economics and the capabilities view, Williamson (1999) still accepts that the latter is much more a theory of organizational heterogeneity than is the former. Thus, although the capabilities view may be somewhat lacking in the dimensions of conceptual clarity, operationalization of key concepts, and causal mechanisms, the view is usually taken to be our best shot at a theory of organizational heterogeneity.

Certainly, the capabilities view (and its intellectual pedigree, e.g., Penrose, 1959; Cyert and March, 1963; Richardson, 1972) has from the beginning stressed heterogeneity. Indeed, perhaps the single most important source of the capabilities view, namely Nelson and Winter (1982), is fundamentally a theory of the population level consequences of firm-level heterogeneity. The function of routines and capabilities in this literature is to provide a theory of such heterogeneity. The capabilities view, as anticipated and developed by Penrose (1959), Richardson (1972) and Nelson and Winter (1982) became a cornerstone of mainstream strategic management theory because it seemed to offer a foundational understanding of the heterogeneity that underpins competitive advantage.

However, while the “capabilities first” literature has heterogeneity as its explicit focus, there are several concerns with how this heterogeneity is explained. First, “capabilities first” approaches focus almost exclusively on organizations and not on markets, and therefore are not meaningfully comparative (see Zenger et al., 2011). Theories of organization that underpin the capabilities perspective, with the exception of transaction cost economics, have largely focused on the virtues of internally housing capability, rather than the comparative virtues of markets and firms in forming and housing capability. This concern is not new. Winter, in his 1964 review of *A Behavioral Theory of the Firm* (Cyert and March, 1963), highlights how this work sets aside matters related to markets and he questions the “assertion that [theories of organization and theories of markets] are concerned with different problems” (1964: 147). Yet, the lack of concern for comparative dynamics and markets is seemingly the present state of capabilities theories, particularly *vis-à-vis* explaining heterogeneity versus organizational boundaries. The intervening years have seen few, if any, capabilities-based theories that are meaningfully comparative in nature. To simply say that heterogeneous capabilities “pre-exist” the governance choice is not a complete explanation and only

leads to an infinite regress. Where do these capabilities come from in the first place? Any economic explanation of heterogeneity, then, should clearly also discuss the respective differences among alternative forms of governance, specifically markets and hierarchy. As we will discuss, governance is inherently tied up with capability.

A second, but related, concern with the “capabilities first” approach, then, is that it tends to *assume* heterogeneity—taking it for granted—rather than theoretically explaining it. To illustrate, Jacobides and Winter’s explicitly wonder why “some continue to see heterogeneity as a puzzle” (this issue: page 6). They point to heterogeneity as a readily observable “empirical fact” and argue that “the notion that heterogeneity is a puzzle is itself a puzzle” (this issue: 7). They further argue that the “mechanisms that are intrinsic to the capability creation process itself are quite sufficient to explain heterogeneity; more specific reasons are not required” (this issue: 7). However, this sort of taken-for-grantedness about capability heterogeneity only restates the problem and fails to illuminate the origins of and governance choices associated with capabilities. There is no question that organizational heterogeneity is ubiquitous. “Capabilities first” approaches essentially assume this heterogeneity or retrospectively point to its presence by highlighting path-dependence, experience, history and context (Felin and Foss, 2011). Put differently, to say that history matters is a restatement of the problem rather than an explanation of the choices that resulted in that history. Historical path-dependence does not offer a choice-theoretic model about how organizational or governance-related heterogeneity arises in the first place. Thus historical explanation only leads to an infinite regress. Temporal and historical explanation needs a cutting-off point, a line of demarcation, from which to proceed toward understanding the choices that lead to heterogeneity.

Third, “capabilities first” approaches are not micro-analytic but rather postulate various macro variables (e.g., routines) that are said to explain heterogeneity. But very little, if any, emphasis is

placed on the nature of transactions, nor on understanding the nature of economic actors themselves, the decisions they make and the incentives they face. Instead, collective constructs such as routines (or even “industry architectures,” see Jacobides and Winter, this issue), or factors such as serendipity and historical inevitability take primacy (for a recent discussion, see Winter, forthcoming). But a central concern in organization science and strategy is the nature of human actors themselves, their abilities to process and generate information, in short, their rationality (cf. Simon, 1985). While Jacobides and Winter (this issue) do address matters of “agency” vis-à-vis the “capabilities first” perspective, the nature and role of agency and rationality in shaping capability has not received adequate theoretical attention over the past decades. In terms of a more micro-analytic focus, it could be argued that some headway has been made in highlighting the “process” nature of capabilities. But, the process-oriented work on organizational capabilities largely relies on descriptive statements about firms rather than theory and micro-analytic explanation. For example, Eisenhardt and Martin (2000: 1105) argue that capabilities are “specific and identifiable processes such as product development,” but their theoretical explanation only further anchors capabilities in idiosyncratic history, without ever addressing the comparative governance choices of managers that shape their formation.

In sum, we think extant, “capabilities first” explanations of organizational capability and heterogeneity are lacking in terms of explanatory logic and depth. While organizational economics has not traditionally taken organizational heterogeneity to be a key focus, a central premise of this special issue is that an integration of organizational economics and capabilities logic can offer more fruitful explanations and theories of the nature of organizational heterogeneity.

A NEW AGENDA: EXPLAINING ORGANIZATIONAL HETEROGENEITY WITH ORGANIZATIONAL ECONOMICS

Is Organizational Economics Incapable of Addressing Organizational Heterogeneity?

A long-standing critique of organizational economics is that it neglects or downplays the heterogeneous knowledge and technology that underpins “capability” (Milgrom and Roberts, 1988; Demsetz, 1988; Winter, 1988; Langlois, 1992; Langlois and Foss, 1999). As Holmström and Roberts (1998: 90) observed,

Information and knowledge are at the heart of organizational design, because they result in contractual and incentive problems that challenge both markets and firms. Indeed, information and knowledge have long been understood to be different from goods and assets commonly traded in markets. In light of this, it is surprising that the leading economic theories of firm boundaries have paid almost no attention to the role of organizational knowledge. The subject certainly deserves more scrutiny.

While organizational economists have not entirely neglected “organizational knowledge” (e.g., Arrow, 1974; Prescott and Visscher, 1980; Kreps, 1990; Cremer, 1994; Garicano, 2000; Garicano and Wu, this issue), the concept has not been explicitly admitted as either a part of the *explanans*, or of the *explanandum* in “leading economic theories of the firm.” Indeed, Williamson (1985: 88) admits that transaction cost economics “freezes” technology as a heuristic starting point: “A useful strategy for explicating the decision to integrate is to hold technology constant across alternative modes of organization and to neutralize obvious sources of differential economic benefit.” Thus, simple formal expositions of transaction cost economics use traditional neoclassical production theory with its attendant assumption that production knowledge is blueprint knowledge (e.g., Williamson and Riordan, 1985). If taken to its logical extremes, the foundation in neoclassical production theory has two consequences. First, production capabilities are homogenized across firms in an industry (Langlois and Foss, 1999). Second, it rules out the possibility that governance

can antecede knowledge in the sense that the choice of governance structures and the deployment of governance mechanisms within those structures influence the amount, type, and quality of the knowledge that is sourced, shared, integrated, and created. In sum, firms in an industry do not differ in terms of their capabilities at the outset. Governance, therefore, has essentially no role to play in explaining differential capabilities, because the theory rules out such differences.

However, one should not confuse heuristic assumptions with substantive theory. In fact, classical organizational economics has right from the beginning developed many theoretical mechanisms that can potentially shed light on organizational heterogeneity (cf. also Putterman, 1995). Thus, Alchian and Demsetz (1972) argued that a key purpose of the “specialized surrogate market” of the firm is to gain superior (relative to other firms) knowledge about productivities, and the efficient matching of employees and activities. Thus, in their paper the existence of the firm is directly linked to the ability to gain and deploy superior knowledge. A similar argument can be derived from Williamson, Wachter and Harris’ (1975) point that an advantage of intrafirm labor allocation is that it can take advantage of costly to communicate rating information. Alchian (1984) stressed the relational rents stemming from improved information gained by repeated association. Such rents, rooted in superior knowledge, may give rise to opportunistic haggling that is best controlled within the firm. Sah and Stiglitz (1985) explained how organizational structures may be conceptualized as structures for evaluating projects, and different structures will yield different evaluation outcomes. The knowledge-related activity of evaluating, for example, innovation projects, is directly linked to internal organization. Jensen and Meckling (1992) examine how the delegation of decision rights influences the utilization of locally held knowledge, which places knowledge utilization center stage. Many papers in agency theory have explicitly linked

organizational practices, such as the up-or-out mechanism, to human capital accumulation (Prendergast, 1993).

Perhaps most importantly, the central concept of asset specificity that drives boundary choices in the transaction cost literature is directly linked to the formation of capability and firm specific differences. Indeed, Williamson (1975: 28) discusses the role of specialized investments as seeking to generate “non-trivial cost advantages,” thereby ensuring that “outsiders are not on parity with insiders....because outsiders lack firm specific, task specific, or transaction specific experience.” Similarly, Klein, Crawford and Alchian (1978) highlight the role of asset-specific investments in creating appropriable quasi rents—rents that arise when assets are modified in such a way that value generated in their current use is greater than value generated in their next best use.

Admittedly, however, while such theoretical mechanisms in organizational economics can explain heterogeneity, the connections are not well developed. Moreover, organizational economics has refrained from highlighting the issue of why such mechanisms should work differently in different firms. However, it is not at variance with organizational economics to posit that managers face different constraints, possess different cognitive capacities, or have different utility functions, and will therefore make different choices (Williamson, 1999; Furubotn, 2002). Nor is it inconsistent with organizational economics to posit that such choices are path-dependent (Williamson, 1996; Argyres and Liebeskind, 1999; Foss and Foss, 2008).

TWO THEORETICAL ROLES OF ORGANIZATIONAL ECONOMICS

IN EXPLAINING HETEROGENEITY

We argue that organizational economics plays, or has the potential to play, two key theoretical roles in explaining paths to heterogeneity. First, organizational economics has the capacity to provide important insights into the largely entrepreneurial process of assembling unique resource

configurations and selecting the associated form of governance. Through governance choices, firms form and appropriate rents from configurations of assets or activities pre-conceived by the entrepreneur as valuable or capability forming. Indeed, as we discuss below, much of the transaction cost economics and property rights literature has at least implicitly focused on this agenda. Furthermore, organizational economics can provide valuable insights into how organizational design and boundaries facilitate the formation of the knowledge or insight that precedes the assembly of a valuable asset or activity configuration. Here the efficient governance of knowledge or knowledge production generates valuable capability. Second, because efficient organization or efficient governance can itself be an important source of competitive heterogeneity, organizational economics provides insights into how firms differ in the skill, agility, and competence with which they govern. Below we discuss each of these theoretical arenas, highlighting both the potential for contribution and connections to existing literature, including important contributions presented in this Special Issue.¹

Capability Governance

Governing the formation and appropriation of capability. The origins of heterogeneity lie in the choices that managers and entrepreneurs make concerning the activities and assets to combine and the choices of how to govern them. In this manner, heterogeneity among firms can be seen as stemming from the creative, entrepreneurial foresight and judgment of managers in assessing alternative recombinations and their adeptness in effectively organizing the requisite assets, activities, and resources (cf. Felin and Zenger, 2009; Foss & Klein, 2012; Zenger et al., 2011). In seeking to create value, managers discover and assemble a valuable “bundle of unique resources and relationships” (Rumelt, 1984), and appropriate a portion of the resulting returns. As a broad

¹ Another approach is to use organizational economics to model heterogeneity in communication codes and culture across organizations (Garicano and Wu, this issue). Our focus in this essay, however, is on governance and capability.

range of the strategy literature describes, performance heterogeneity stems from heterogeneity in the complementarity, superadditivity, interconnectedness, or simply the fit of this bundle of assets, activities, and resources (Milgrom and Roberts, 1990: 514; Montgomery and Wernerfelt, 1988; Amit and Shoemaker, 1993; Dierickx and Cool, 1988; Porter, 1996).²

The governance literature in organizational economics provides important insights to the manager's task of assembling these complementary asset and activity bundles. Thus, the transaction cost economics literature focuses on the concept of asset co-specialization (or unique complementarity among assets) as the primary driver of integration choices. Integration facilitates the generation and protection of rents that accrue from co-specialized asset and activity combinations. In this literature, "capability" arises from co-specialized investments made either in the course of exchange or subsequent to an agreement to exchange. "Investments" should, importantly, be understood to also include the co-specialized human capital that arises as a result of teamwork (Alchian, 1984). Exchange-specific investments generate what Williamson (1975: p. 28) describes as "non-trivial cost advantages" and transform exchanges that are rather competitive into "small numbers bargaining." In other words, through co-specialization an abundance of homogeneous suppliers are transformed into a few (or one) capable supplier(s). These co-specialized investments generate "appropriable quasi-rents" that create costly bargaining and contract negotiation and enforcement (Klein, Crawford, and Alchian 1978: 298). Interestingly, Penrose (1959: 21), who was perhaps the first to articulate the firm as a bundle of resources also recognized that while some resources "are acquired directly in the market," others that are "produced within the firm can neither be purchased nor sold outside the firm." Thus, asset

² Adopting this logic, Lippman and Rumelt define strategy as the "creation, evaluation, manipulation, administration, and deployment of unpriced specialized scarce resource combinations" (2003: 1069).

combinations enabled by governance choices that promote co-specialized investment are a key source of heterogeneity.

While co-specialized investment is the presumed path to capability formation in the governance literature, investment is not necessary to generate heterogeneity (Lippman and Rumelt 2003: 1079). As suggested by strategic factor market logic (Barney, 1986), simple heterogeneity in assets and activities may render some assets and activities better matched (and in this sense co-specialized) even in the absence of investment (also see Lachmann, 1956). Thus, the task of the entrepreneur-manager is to discover underpriced assets and activities by identifying co-specificity among assets that others do not recognize or that others cannot effectuate because they lack critical complementary assets (Argyres and Zenger, forthcoming). The entrepreneur-manager essentially imagines possible asset bundles and combinations (Felin and Zenger, 2009; Foss and Klein, 2012) and associated forms of governance that might maximize value creation (Zenger et al., 2011). This foresight permits the entrepreneur-manager to participate in strategic factor markets and acquire assets at prices below their future value, as deployed within the manager's envisioned bundle. Here integration occurs not to protect co-specialized investments that are made *ex post*, but rather to secure underpriced assets whose value will necessarily elevate *ex post* once the entrepreneur-manager assembles the bundle and thereby reveals its value.

Note that resource-based or strategic factor market logic by itself fails to address the governance or boundary decision, which is central for developing capabilities and creating value. While resource-based logic makes some prediction about what assets and activities to bundle, the theory fails to clearly articulate why acquisition or integration is necessary rather than a simple contract for the services or output of an asset owned externally. Of course, the answer here is obvious and follows directly from organizational economic logic. Failure to integrate valuable co-

specialized assets creates a significant contracting or hold-up problem *ex post* (Williamson, 1975; Klein, Crawford, and Alchian, 1978). Thus, though largely unspoken, organization economic logic is central to understanding the strategic factor market logic that underpins the resource-based perspective on the origins of heterogeneity.

In summary, organizational economics is central to understanding the process by which organizational heterogeneity emerges. It is key to understanding how valuable bundles of co-specialized assets, resources, and activities are created through investments, where necessary, and protected from appropriation by external parties. Matching or unique complementarity among assets and activities is the essence of value creation. However, this unique complementarity elevates the threat of holdup and encourages integration.

Capability itself as a determinant of integration. Perhaps the most widely articulated connection between capability and organizational economics is that the choice of firm boundaries follows quite logically from the possession of capability. In simple terms, firms own what they do well and outsource what they don't (Kogut and Zander, 1992; Langlois and Robertson, 1995; Barney 1999). We are not aware of careful and detailed explication of the micro-foundations of this argument, but the underlying reasoning seems to begin from the notion that what firms do well is also highly inarticulate (Kogut and Zander, 1992). Thus, firms know more than they can communicate in a cost efficient manner across their boundaries, for example, to suppliers (Silver, 1984; Langlois, 1992; Monteverde, 1995). In other words, the argument is that economizing on communication costs and/or the need to make rapid decisions drive boundary decisions (and perhaps also explains the existence of firms, although this has not, to our knowledge, been articulated): If a firm finds it too costly to communicate with suppliers or finds them too slow to react, in-house provision of the relevant service or product may be the lower cost alternative

(indeed, Langlois [1992] argues that this is a particularly relevant explanation of firm boundaries in dynamic, Schumpeterian environments).

The causality in such reasoning runs from capability to boundaries, mediated by communication costs. However, as Argyres and Zenger (forthcoming) argue, the causal direction often runs the reverse—governance choices condition capability formation. Equally important, the simple prediction that firms integrate when they possess superior capability fails to recognize that the assessment of a capability is different for different firms. This is because firms differ in the bundles of other assets that they possess. Therefore, due to the heterogeneity among assets and activities and the unique patterns of complementarity that govern alternative recombinations, any particular asset adds more value to one firm than another. Thus, a firm's willingness to pay for an asset is shaped, not merely by the attributes of the asset itself, but by the attributes of the heterogeneous bundle of other activities, assets, and resources of the firm (Argyres and Zenger, forthcoming). For example, the productive value of a gold mine, as a standalone asset, does not determine its optimal owner. Rather, its optimal ownership reflects the relative value that alternative owners can generate with the asset. Variance in these capability valuations thus derives from variation in how other assets and attributes of the firm—including entrepreneurial vision and managerial skills—interact with this focal asset (Foss and Klein, 2012). Thus, the firm specificity of an asset's capability, i.e. the uniqueness of its value to the firm, drives integration, since failure to integrate leaves the firm vulnerable to holdup.

In some instances, these firm specific valuations reflect heterogeneous assessments of how assets can be modified to uniquely fit with the firm's existing assets. A central tenet of organizational economics is that governance should be crafted so as to support and safeguard investments in critical specific assets. This same logic drives the entrepreneur's approach to

developing a business idea. The entrepreneur must determine which resources to own, as resource ownership influences the incentives to make these critical specific investments. Ownership of a resource grants residual control rights over a resource, especially the right to exclude others from access. The allocation of ownership rights thereby shapes the bargaining positions of contracting parties (Grossman and Hart, 1986; Hart and Moore, 1990). Thus, a benefit of vertical integration is the strengthening of the owner's incentive to invest money into honing and refining her entrepreneurial idea.

Opportunity Recognition, Knowledge and Firm Boundaries. Organizational economics also provides important insights regarding how to organize the process of discovering and disseminating knowledge or capability. From a dynamic perspective, firm-level entrepreneurial opportunities emerge and are exploited along paths shaped by firm experience, as well as property rights and transaction costs. Foss and Foss (2008) argue that two mechanisms link transaction costs and opportunity recognition and exploitation. First, transaction costs determine how well defined and enforced property rights to resource attributes are; in turn, this influences the value that entrepreneurial resource owners expect to appropriate, and therefore their incentives to engage in opportunity discovery (Shepherd and DeTienne, 2005). This “appropriability mechanism” influences entrepreneurial search; certain avenues of search are disregarded because value appropriation is considered too low (e.g., they may be associated with hold-up risk). Second, extant research strongly suggests that entrepreneurial experience antecedes opportunity discovery (e.g., Shane, 2000). However, experience (also) emerges from entrepreneurs' learning about the attributes of resources (Mahoney, 1995). Such learning entails transaction costs, for example, the costs of measuring the productivity potential of employees. Such transaction costs influence how much will

be learned and where learning will take place. This introduces path dependence in learning behaviors, producing observed firm-specific trajectories of opportunity discovery and exploitation, that is, heterogeneous capability (Helfat, 1994, 1997).

While boundary choices play a critical role in shaping incentives to pursue innovation that leads to heterogeneity, other features of organizational design or internal organization may also shape incentives to contribute to building heterogeneous capability. Thus, firms differ in how effectively they motivate employees to pursue entrepreneurial opportunities. Even though employees play the key role in developing and pursuing business opportunities, rewarding them for costly search raises distinct challenges for compensation management. The firm could choose to simply reward employees for aggressively pursuing business ideas, but such behaviour is not always desirable (Stieglitz and Foss, 2009). Moreover, from the standpoint of an employee, investing effort into searching for a promising project is risky, because he may have no clue regarding project selection. Improving employee incentives for value-creating search has two components. First, the firm needs to credibly commit to reward an employee for an adopted project. Second, the firm needs to credibly convey what *kind* of projects it will adopt. The firm may then be better off sticking to a narrow business strategy (Rotemberg and Saloner, 1994, 1995; Rajan and Zingales, 2001). This translates into a commitment to only consider business ideas within a narrow set of business activities, while disregarding opportunities outside of that domain. Such a commitment sends a signal to employees that a project gets funded if it appears profitable and falls within the business domain of a firm, which improve employee incentives to search (within the specified domain). In other words, conceptually at least, heterogeneous “core competence” may be driven entirely by incentive considerations.

Within the strategy literature, knowledge, defined as a firm's capacity to combine and process inputs into valuable outputs (Arrow and Hahn, 1971; Nelson and Winter, 1982: 59-60), is frequently used as a near synonym for capability. Thus, a key organizational economic question is how an entrepreneur or firm organizes the generation and effective dissemination of valuable knowledge or capability. The literature often described as the knowledge-based view or knowledge-based theory of the firm has taken up this agenda and in the process has made important progress in integrating the organizational economic and capabilities perspectives. Much of this literature has focused on the role that firm boundaries (or hierarchy) play in facilitating the efficient exchange or dissemination of knowledge. One strand of this literature points to hierarchy's enhanced capacity to transfer knowledge (i.e. capability) through an expanded capacity to generate common language, a shared identity, or a more trusting social environment (Arrow, 1974; Kogut and Zander, 1992; 1996; Nahapiet and Ghoshal, 1998; Monteverde, 1995). Another strand of this literature argues that hierarchy's advantage stems from its capacity to use authority to essentially transfer knowledge through directives rather than the costly process of communication and education (Demsetz, 1988; Conner, 1991; Conner and Prahalad, 1996). One outgrowth of this literature has been defining a connection between the type of knowledge that needs transfer and the form of governance used to facilitate it, with the most common prediction that tacit knowledge pushes towards integration, while codified knowledge warrants contracted exchange (e.g., Kogut and Zander, 1993; Azoulay, 2004).

This literature has also taken up the question of how governance shapes the process of discovering knowledge (i.e. capability) itself, rather than merely facilitating its transfer. In this instance, the exercise is not about aligning attributes of knowledge to forms of governance, because the knowledge itself has yet to be developed. The question is instead: how should the firm organize

the process of generating the knowledge that it seeks? One approach suggests that the governance choice begins by defining the problem that the firm seeks to solve (Nickerson and Zenger, 2004). In other words, firms seek knowledge or capability to address some particular problem or customer need. While non-existent knowledge cannot be parameterized, the problems that firms seek to address can be parameterized. In particular, problems differ in their complexity, specifically in the degree to which the distinct design choices that define solutions are independent or interdependent (Simon, 1962; Nickerson and Zenger, 2004). Since solutions (i.e. new knowledge or capability) are generated through recombination of existing knowledge, the complexity of a problem defines the need and form of knowledge exchange required to facilitate solution discovery. Different governance forms differ in the efficiency with which they facilitate the transfer of knowledge in support of problem solving, and can thus be matched in a discriminating way to problem types.

Several papers in this special issue speak to the question of how firms efficiently govern the development of knowledge-based capability. Kapoor and Adner (this issue), for example, find that integrated firms are better able to develop rapid new product development capability, especially when new product development involves architectural rather than component change. Grahovac and Butler (this issue) use simulation to compare different governance forms on their abilities to learn about changes in the environment. One of their findings, for example, is that hierarchies outperform the other forms when agents' abilities to observe the environment are heterogeneous, their abilities to imitate each other are limited, and the task is difficult. Marengo and Pasquali's model (this issue) shows that finely partitioned decision rights in an organization, combined with moderate levels of managerial intervention, are particularly conducive to learning. A key finding by Mayer, Somaya and Williamson (this issue) is that early decisions by firms to outsource or insource legal capability affect later decisions to do so through the buildup of such capability in buyers or suppliers.

Governance Capability

While examining how governance choices shape the formation and discovery of capability is an important path to integrating organizational economics and the capabilities perspective, governance itself may be a distinct capability—a capability to efficiently design and implement governance arrangements. As noted above, organizational economics has traditionally assumed either that economic actors are fully rational, or that the rationality that economic actors possess is bounded in a particular way; namely, actors are assumed to be unable to foresee all the possible future contingencies that could affect an exchange relationship. Yet rationality in many cases may be more severely bounded. For example, some actors may not know how to design governance arrangements to efficiently handle those contingencies that they *can* foresee, or even contingencies that they have actually experienced in the past. This implies that governance capabilities may differ across organizations, at least in the short to medium term. This is often enough time for rents to be earned by the more “governance-capable” firms.

Governance capability has been studied most explicitly in the literature on alliances and contracting. A stream of literature in strategy, for example, focuses on how firms learn to manage alliances over time (e.g., Doz 1996; Dyer and Singh 1998; Anand and Khanna 2000). Child (2001: 459), for example, writes that, learning in alliances involves “the accumulation of mutual experience with and knowledge about how to manage inter-organizational cooperation *per se*.” This stream of research led Kale, Dyer and Singh (2002) to propose and develop the concept of an “alliance capability.”

While work on alliance capability has not focused much on organizational economic determinants of this capability, a key dimension of alliance capability may well be the capability to design contracts that generate valuable relational governance in alliances. Mayer and Argyres (2004) have argued that just as firms learn to manage alliances generally, they also must learn how to design contracts that deliver desired outcomes, especially in novel industry environments. They suggest that efficient contracting may take years to emerge through trial-and-error and local search, but that the direction of learning is predictably consistent with organizational economic prescriptions. Broader evidence that learning effects on contract design are important has been found (e.g., Argyres, Bercovitz and Mayer 2007; Vanneste and Puranam 2010). Argyres and Mayer (2007) explored various aspects of contract design capabilities within the firm, and their implications for competitive advantage. For example, contract design capabilities that contribute to competitive advantage may involve knowledge about how to efficiently match lawyers, managers and engineers in the development of the contract sections most appropriate for each.

This literature on contract design capabilities, then, represents one way to go beyond acknowledging complementarity between capabilities and organizational economics approaches to the firm, and begin to integrate the two at a more fundamental theoretical level. Here, the design of contract structures itself becomes a capability that is managed for competitive advantage, something that neither organizational economics nor the capabilities approach alone had fully appreciated. Thus, organizational economics may define paths of governance learning and highlight the role of governance in forming capabilities through inter-organizational relations.

Governance capabilities are not just limited to the design and management of interorganizational relationships through alliances and contracts. Internal governance is also subject to learning and capability development as well. For example, firms may over time build

organizational capabilities for designing organizational structures and incentive systems. Siegel and Larson (2009), for example, showed how Lincoln Electric over time adapted its well-known piece-rate pay system to better fit different institutional environments in various countries. Empirical research in organizational economics also suggests that otherwise similar firms can differ significantly in their bundles of organizational design choices, suggesting that some have developed superior internal governance mechanisms (e.g., Ichniokowski and Shaw, 1997; Bloom and Van Reenen, 2007). This kind of design capability theme emerges in some of the international management literature on transfer of best practices abroad, and is at least implicit in some of the organizational learning literature.

Firms' capabilities for organizing internally may also reside in the informal organization, or in the interplay of a firm's informal and formal organization as they complement or balance each other. Again, while the roles of learning, capabilities development and organizational heterogeneity are not always treated explicitly, the large literatures on leadership and organizational culture, psychological contracts, and other areas within organization studies nevertheless often carry implications for how firms learn to organize themselves more efficiently over time (e.g., Scott 1981; Schein 1985; Rousseau 1990; Poppo and Zenger 2002; Argyres and Mui 2007). Gibbons and Henderson (this issue) is an explicit treatment of how differential organizational capabilities reflect different kinds of relational contracts within the organization. They explain how relational knowledge gained over time can be an important basis for sustainable competitive advantage. Clearly, there is much to be gained by better understanding how firms develop relational knowledge and nurture relational contracts within the organization, and also how they manage the interactions between formal authority and relational contracts, both within and without the firm. It is for instance this relationship and the dynamics of this relationship that underpin the need to examine

and manage organizational design in a rather dynamic manner. Capable firms learn to efficiently manage the underlying tradeoffs that characterize the fundamentally discrete choices faced in organizational design to address a rather complex and continuous array of design objectives (Boumgarden, Nickerson and Zenger, 2012).

Empirical research is already emerging to explore how firms combine formal contracting with relational governance to exploit complementarities between them. This kind of research seeks to provide insight into how formal authority and relational contracts interact within organizations (Poppo and Zenger, 2002; Ryall and Sampson, 2009). Mayer, Weber and Macher (2011), for example, explore how firms can improve their contracting capabilities by understanding the psychological effects of economically-equivalent termination clauses. Another direction is to explore how firms can organize their internal contracting activities to promote the development of contract design capabilities, including how they use outside law firms. Yet another direction is to explore how firms develop governance capabilities in challenging social and economic environments, such as those in many developing and transition economies. Legal regimes, for example, can be challenging in many ways. Thus, due to a lack of history of complex contracting in a given country, contracting practices may not be standardized for even common types of business-to-business transactions. In addition, default legal rules that guide that parties under contingencies not anticipated in the contract may be lacking, or may be onerous. Contract enforcement may be more uncertain and problematic than in developed countries, perhaps due to corruption, or to lack of resources in the legal system. Labor or capital market regulations or customary practices may require investment in new internal governance capabilities. Studying the development of governance capabilities in these challenging environments may provide an especially clear window into their development more broadly. Taking an approach to these studies that integrates capabilities

and organizational economics approaches is likely to be more fruitful than taking an approach that emphasizes one or the other alone.

Several other articles in this special issue shed light on governance capabilities of various kinds. For example, Qian, Agarwal and Hoetker (this issue) find evidence that diversifying entrants into an industry are more likely than start-up firms to vertically integrate links in the value chain. The authors attribute this difference to superior capabilities that diversifying entrants have built up for communication and coordination of value chain activities (“integrative capabilities”). Kapoor and Adner (this issue) also find evidence consistent with the development of integrative capabilities by integrated firms. They in addition find evidence that firms’ capabilities for capitalizing on relationships with suppliers are improved with greater knowledge of the buying firm about the supplier’s component. Finally, one of Fabrizio’s (this issue) key findings is that firms develop contracting capabilities over time, but that an industry’s regulatory environment can substitute for firm-level contracting capabilities.

CONCLUSIONS

Explicit assumptions about the knowledge held by entrepreneur-managers and employees have been an integral part of organizational economics since its beginning (Knight, 1921; Coase, 1937). The large body of research in organizational economics, over the last forty years, has placed assumptions about how well agents and individuals process knowledge (team theory), and what knowledge they possess (contract theory, transaction cost economics), center stage. For example, agency theory makes several explicit assumptions in these domains (e.g., shared common priors, common knowledge, specific assumptions about what exactly is asymmetric information). Equilibrium outcomes in terms of contracting, levels of monitoring, and so on are crucially dependent on what exactly is assumed about knowledge in these models. More generally,

asymmetric information, ignorance about future contingencies, ambiguity concerning contract terms, and the like are invoked to explain imperfect and incomplete contracting, ownership patterns, and incentive design. Thus, organizational economists have never truly “neglected knowledge” or capability.

However, what can rightly be claimed is that, until recently, organizational economics did not pay much attention to organizational heterogeneity; thus, the organization of transactions across governance structures was in focus, but the possibility that different instances of the same governance structure (e.g., firms) in the same industry may organize transactions differently, and with different results, was not looked into (Holmström and Roberts, 1998). Therefore, it is only recently that organizational economists and organizational scholars influenced by organizational economics have systematically begun to address the governance of capability and the capability of governance. Of course, as we have argued, organizational economics already has for several decades pointed to theoretical mechanisms that help endogenize firm-level knowledge, that is, capability. Despite the capability critique that organizational economics assumes (at least as a heuristic starting point) homogeneity of such firm-level knowledge, nonetheless scholars increasingly include knowledge-related factors and mechanisms in the study of capability formation.

It is important to note that although we argue that organizational economics can significantly enhance our understanding of capability formation, they are hardly the entire story. Some areas of organizational economics do make strong assumptions about the cognitive powers of individuals. At least the formal manifestations of organizational economics (i.e., contract theory) explicitly make the assumption that individuals hold the same, correct, model of the world (although this is changing; see, e.g., Tirole, 2009). These assumptions are built into formal contract theory (i.e.,

agency theory and property rights theory) through the assumption that payoffs, strategies, the structure of the game, and so on are common knowledge. Bounded rationality is often invoked as a necessary part of the theory of the firm, particularly by Williamson (1985, 1996). However, most of the contracting problems studied in the modern theory of the firm require only asymmetric information (Hart, 1990). Indeed, bounded rationality seems hitherto to have served little function beyond justifying the assumption that contracts are incomplete. And yet, bounded rationality may influence economic organization in many other ways, as is increasingly being recognized (Tirole, 2009; Fehr, Hart and Zehnder, 2008; Hart and Moore, 2008). Thus, behavioral economics insights about reference points, ambiguity, loss aversion, etc. are increasingly being brought to bear on contracting. Incorporating them more fully into organizational economics may lead to additional insight into heterogeneity and otherwise allow organizational economists to tackle issues that have often been thought of as the turf of capabilities theorists (e.g., loss aversion may help explaining organizational rigidity).

In sum, this article calls on scholars to more carefully specify and discuss the relationship between capabilities and governance. We think that it is central to recognize the role that organizational economics can play in helping us understand both capability governance and the comparative factors associated with the governance of capabilities. We encourage theoretical work that elevates the logical integration between organizational economics and capabilities work and avoids semantic debate. We encourage a more precise treatment of the concept of capability, specifically articulating its necessarily firm specific nature. We also encourage empirical work that more precisely recognizes and examines the logical integration of organizational economics and capability. The papers in this Special Issue make important progress along this path.

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