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Capabilities and Governance: the Rebirth of Production in the Theory of Economic Organization

by

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Abstract
We argue that since Coase's seminal 1937 paper on "The Nature of the Firm," there has been an odd and unjustified separation between price theory and the economics of organization. For example, matters of production has been the domain of the former exclusively. However, a new approach to economic organization, here called "the capabilities approach," that places production center-stage in the explanation of economic organization, is now emerging. We discuss the sources of this approach and its relation to the mainstream economics of organization.

Keywords
Capability, Theory of the Firm, Price Theory

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I. Introduction

Some 25 years ago, Ronald Coase (1972, p. 63) observed tartly that his 1937 essay "The Nature of the Firm" had been "much cited and little used." The landscape of economic thought changed significantly in the years that followed, and a large body of literature quickly emerged that not only "used" but in many ways sprang from Coase's paper.[1]

In spite of some not inconsiderable variety among the contributions to this literature, it is fair to say that the literature is in agreement on the fundamentals. The basic insight is this: in addition to production costs of the usual sort, one must also consider transaction costs in explaining institutions like the firm. Whether called transaction-cost economics (Oliver Williamson 1975, 1985) or the economics of organization more broadly (Paul Milgrom and John Roberts 1992), the Coasean literature of the last 25 years has indeed focused precisely on the comparative transaction costs of alternative organizational structures, including, paradigmatically, the choice between firms and markets. Moreover, the literature has seen the "nature" of the firm — and, indeed, of other institutions — as fundamentally contractual.[2] That is, firms and other institutions are alternative bundles of contracts, understood as mechanisms for creating and realigning incentives.

Clearly, this recent blossom of interest in the economics of organization has been driven by a dynamic within present-day economic theory, one fueled mostly by advances in the economics of information and uncertainty and by applications of game-theory and recent mathematical methods. At the same time, however, the modern literature also owes much to the way Coase originally sought to explain the existence, the boundaries, and the internal organization of the firm.[3] Coase was not writing in a vacuum: he was working within the context of pre-war economic theory. As a result, today's economics of organization arguably bears the imprint of the economics of the 1930s as well as Coase's reaction to that theory. The legacy of this "path-dependent" history, we will argue, has been a tendency (albeit an imperfect tendency) to respect an implict dichotomy between the production aspects and the exchange aspects of the firm or, to put it another way, between production costs and transaction costs.

We do not mean to say by this that present-day theory depicts production as completely unaffected by exchange. In fact, the crucial point of some extremely influential recent research has

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1 In fact, just around the time of Coase's remark, two landmark contributions in this literature had appeared, namely Oliver Williamson (1971) and Armen Alchian and Harold Demsetz (1972). These contributions fostered somewhat different intellectual trajectories within the post-Coase literature on the economics of organization (Armen Alchian and Susan Woodward 1988; Paul Milgrom and John Roberts 1988; Oliver Hart 1989).

2 And this is arguably so even for those who do not follow Steven Cheung (1983) and others in seeing the firm as nothing other than a "nexus of contracts."

3 As Bengt Holmström and Jean Tirole (1989) have remarked, the very idea that a "theory of the firm" should address all three of these issues is thoroughly Coasean.

been to demonstrate rigorously that alternative organizational structures might be chosen because they imply different incentives to invest in specific assets (Sanford Grossman and Oliver Hart 1986; Oliver Hart 1995). In many recent models, indeed, technology and organizational structure are determined jointly (Michael Riordan and Williamson 1985; Paul Milgrom and John Roberts 1990). What we do mean is rather that there exists an odd and unjustified allocation of responsibilites between price theory and the economics of organization. To price theory has been consigned the basic theory of production, with an implicit agreement that the production function, and its attendant assumptions, tells us what we need to know about *production costs*. In price theory, productive knowledge is seldom portrayed as imperfect or asymmetric, let alone tacit or "sticky" (Harold Demsetz 1988; Sidney Winter 1988). Knowledge about alternative production possibilities is explicit, freely transmissable, and easily encapsulated in what Joan Robinson (1956) called "blueprints."

By contrast, imperfect knowledge is arguably the *raison d'être* of the modern literature on the economics of organization. To an overwhelming extent, however, all such imperfections — all deviations from the assumptions of the production-function formulation — are seen as falling exclusively in the realm of *transaction costs*. In today's economics of organization, transacting is fraught with hazards, and the problem of organization is one of creating governance structures to constrain the unproductive rent-seeking behavior that imperfect information permits. Indeed, it is probably not unfair to say that the heuristic driving this literature is to reduce virtually all problems of economic organization to problems of misaligned incentives attendant on imperfect information.

The result of this partition of responsibilities has been an imbalance in the economics of organization. Seldom if ever have economists of organization considered that knowledge may be imperfect in the realm of production, and that institutional forms may play the role not (only) of constraining unproductive rent-seeking behavior but (also) of creating the possibilities for *productive* rent-seeking behavior in the first place. To put it another way, economists have neglected the benefit side of alternative organizational structures; for reasons of history and technique, they have allocated most of their resources to the cost side.[4]

Our goal here is to attempt briefly to document and criticize this intellectual partition. More importantly, however, we suggest that the partition is beginning to break down. This latter point has not gone entirely unnoticed. Paul Milgrom and John Roberts (1988, p.450), two of the leaders in the formalist branch of the post-Coase literature, made the following prediction almost a decade ago. "The incentive based transaction costs theory has been made to carry too much of

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[4] We are not alone in this view. In his recent review essay on Milgrom and Roberts (1992), a widely cited textbook treatment of the modern economics of organization, Brian Loasby notes that, "despite their ready acknowledgement of [Alfred] Chandler's work, Milgrom and Roberts prefer the transaction as the unit of analysis, and do not enquire into the productive activities which a firm undertakes. The final chapter, of only ten pages, skims over technical change, team production, the creation of capabilities and organizational entrepreneurship" (Loasby 1995, p. 475).

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." We claim that these theories are now emerging.

Thus, we will document the development of a corpus of promising theories of the firm - here called generically "the capabilities view" - that are more conscious of the character and limitations of knowledge on the production side than is the mainstream post-Coase literature. These theories, we argue, have distinct implications for economic organization - implications that are not easily reached within the confines of the mainstream literature on the economics of organization.

Admittedly, the emerging capabilities view is even more heterogeneous than the post-Coase literature, partly because of its diverse backgrounds in business history and strategy, evolutionary economics, and technology studies (more on this in section IV).[5] However, we believe that it is possible to reconstruct one of the central concerns of this body of literature in terms of a revitalized attention to the importance of production costs — now recast in a new way — for understanding the problem of economic organization. One of our important goals here is to bring the capabilities view more centrally into the ken of economists. We offer it not as a finely honed theory but as a developing area of research whose potential remains relatively untapped. Moreover, we present the capabilities view not as an alternative to the transaction-cost approach but as a complementary area of research.

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[5] We also think of the capabilities perspective as in many ways a return to common sense notions that many economists have had all along. In other words, while the capabilities perspective has not been a part of "formal" economics, it has been a part of the economist's more "appreciative" theorizing. (On the distinction between formal and appreciative theory, see Richard Nelson and Sidney Winter (1982, p.46).) For example, formal models of economic growth, of both the Solow-Swan and the New Growth Theory varieties, consider the transfer of technological knowledge in terms of the production function. But those development economists who study in detail the difficulty of transplanting technology to unpropitious organizational and institutional climates would certainly not see technological knowledge as easily available in "blueprints." (On some of these issues see Richard Nelson and Howard Pack (1996) and Richard Langlois and Paul Robertson (1996).) The same could be said of the difference between formal and appreciative theory in industrial organization.

II. Production and Governance: the Post-Coase Literature

We claim that there is in today's economics of organization a strong contrast between the treatment of knowledge for production purposes and the treatment of knowledge for transaction purposes. Such an assertion provokes a number of questions. What is the historical source of this contrast? How, more importantly, is the contrast manifest in the contemporary economics of organization? And what are the consequences of the partition? In this section, we discuss these questions *seriatim*.

A. Historical Sources of the Neglect of Production in the Post-Coase Literature

As Loasby (1976, 1989), Moss (1984), and Metcalfe (1989) have argued, what we think of as "Marshallian" theory today is in many ways less the creation of Alfred Marshall than of some of his successors. In these accounts, price theory received its modern form at the hands of Arthur C. Pigou and others, who helped forge the new value theory of the 1930s out of the contemporary debate on the coherence of Marshall's value theory and the material provided by the spread of Walrasian ideas. Thus the firm of price theory is not really Marshall's "representative firm." Marshall thought in population terms, and constructed a representative firm that reflects the characteristics of the population of firms as a whole rather than the characteristics of any particular firm. By contrast, the price theory that Pierro Sraffa, Joan Robinson, Edward Chamberlin, Jacob Viner, and others built during the 1930s begins with identical idealized firms and then builds *up* to the industry by simple addition. It is this later methodological standpoint, not any logical problem with Marshall's own conception, that led to the famous controversy over increasing returns early in the century.

This, then, is the theory of the firm with which Coase was confronted in the 1930s.[6] This theory begins with firms as production functions. And, with only a few recent exceptions (*e.g.*, Marie-Thérèse Flaherty 1980), the transformation of homogeneous inputs into homogeneous outputs takes place according to given technical "blueprints" known to all. Moreover, the firm of price theory typically operates on two margins only: price and quantity. Now, price theory was never intended to be a theory of the firm as an organization or an institution (Fritz Machlup 1967). As Marshall understood, the firm in price theory is no more than a theoretical link in the explanation of changes in price and quantity (supplied, demanded, or traded) in response to changes in exogenous factors (Brian Loasby 1976; Richard Langlois and Roger Koppl 1991). Thus, using this sort of price theory to explain the existence, boundaries, or internal structure of

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[6] And to which he himself contributed. See, for example, Coase (1937-1938).

the firm — as Coase realized — can never be satisfactory; the theory simply isn't designed to deal with those issues.

At the same time, many economists, probably going as far back as Cantillon and Smith, understood that the costs the firm faces are rather different in character from the fully known and purely technological costs of the production function. One can think of Coase's 1937 essay as crystallizing that long-standing recognition — in a form that at once strongly challenged the price-theoretic formulation while, in an odd way, simultaneously reinforcing it.

What Coase observed was that, in the world of price theory, firms have no reason to exist. According to the textbook, the decentralized price system is the ideal structure for carrying out economic coordination. Why then do we observe some transactions to be removed from the price system to the interior of organizations called firms? The answer, Coase reasoned, must be that there is a "cost to using the price mechanism" (Coase 1937, p. 390). Thus was born the idea of transaction costs:[7] costs that stand separate from and in addition to ordinary production costs.

In a sense, Coase was reasserting Marshall against Pigou, but in a way already circumscribed and defined by Pigovian price theory. Rather than directly challenging the assumption of firm-as-production-function and the unproblematic nature of productive knowledge in price theory, Coase — or his intellectual legatees, at any rate — simply grafted onto price theory a second theory, namely a theory of transaction costs. It is transaction costs that explain, as it were, the institutional overlay of production. Production costs determine technical (substitution) choices, but transaction costs determine which stages of the productive process are assigned to the institution of the price system and which to the institution of the firm. The two kinds of costs are logically distinct; they are orthogonal to one another. As a result, issues of economic organization - such as the boundaries of the firm - cannot turn on considerations of production costs. Present-day theory has not only bought into this view but has arguably reinforced the separation.

B. Production, Coordination, and Incentives in Present-day Theory

As we will argue in more detail below, there are in fact two principal theoretical avenues closed off by a conception of organization as the solution to a problem of incentive alignment. And both have to do with the question of production knowledge. One is the possibility that knowledge about how to produce is imperfect — or, as we would prefer to say, dispersed, bounded, sticky and idiosyncratic. The second is the possibility that knowledge about how to link together one person's

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[7] Even though Coase did not actually use the term in the 1937 article. The term gained currency later in the context of Coase (1960), and was applied retroactively, as it were, to the ideas of Coase (1937).

(or organization's) productive knowledge with that of another is also imperfect. The first possibility leads us to the issue of capabilities or competences; the second leads to the issue of qualitative coordination.

Although Coase may have been led to put aside the issue of capabilities because of the matrix of pre-war price theory in which he was operating, he did not neglect the issue of coordination. In the 1937 article, he lists several sources of those "costs of using the price mechanism" that give rise to the institution of the firm. In part, these are the costs of writing contracts. The "most obvious cost of 'organising' production through the price mechanism is that of discovering what the relevant prices are" (Coase 1937, p. 390). A second type of cost is that of executing separate contracts for each of the multifold market transactions that would be necessary to coordinate some complex production activity. These costs can be avoided by firm organization. However, a careful reading of the paper suggests that it is ultimately a quite different type of contracting cost that attracts Coase's attention. After pointing out that the nature of the firm consists largely in substituting an employment contract for a spot contract in output,[8] Coase suggests that the real costs of contracts may lie in their inflexibility. "It may be desired to make a long-term contract for the supply of some article or service," he writes.

> Now, owing to the difficulty of forecasting, the longer the period of the contract is for the supply of the commodity or service, the less possible, and indeed, the less desirable it is for the person purchasing to specify what the other contracting party is expected to do. It may well be a matter of indifference to the person supplying the service or commodity which of several courses of action is taken, but not to the purchaser of that commodity or service. But the purchaser will not know which of these several courses he will want the supplier to take. Therefore, the service which is being provided is expressed in general terms, the exact details being left until a later date. ... The details of what the supplier is expected to do is not stated in the contract but is decided later by the purchaser. When the direction of resources (within the limits of the contract) becomes dependent on the buyer in this way, that relationship which I term a "firm" may be obtained. (Coase 1937, pp. 391-392.)

A close reading of this passage suggests that Coase's explanation for the emergence of the firm is ultimately a *coordination* one: the firm is an institution that lowers the costs of qualitative coordination in a world of uncertainty.

Since Coase, the economics of transaction costs as applied to organization has burgeoned

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[8] As Herbert Simon (1957) explains the employment relation, the capitalist pays a wage for the right to choose which action $x \in \Omega$ the worker will perform at any time, where Ω is the "job description" or set of allowable actions to which the worker agrees.

into a major subfield in the discipline. Largely in a quest to make Coase's ideas more "operational," this literature has arguably both narrowed his explanation for the firm and moved its focus away from issues of coordination, especially qualitative coordination. More precisely, both the issue of capabilities and the issue of the coordination of production — in the sense of aligning the knowledge and expectations of the parties who need to cooperate in production[9] — have been overshadowed by a dominant interest in issues of incentive compatibility.

Oliver Williamson, the flagbearer of the field since the 1970s, certainly cannot be accused of having a narrow conception of transaction-cost economics. But, in a manner far more explicit than Coase, he has upheld the partition between transaction costs and production costs. This he argues as a pragmatic methodological postulate: hold production costs constant and look only at transaction costs. "A useful strategy for explicating the decision to integrate," he says, "is to hold technology constant across alternative modes of organization and to neutralize obvious sources of differential economic benefit" (Williamson 1985, p.88). This may indeed be a sensible starting point, so long as it is not an ending point.

In Williamson's early work (particularly Williamson 1975), issues of coordination figured prominently. For example, in an echo of the passage from Coase cited above, Williamson argued that internal organization may be a superior mode of coordination whenever boundedly rational transactors confront uncertainty.

> If, in consideration of these [cognitive] limits, it is very costly or impossible to identify future contingencies and specify, *ex ante*, appropriate adaptations thereto, long-term contracts may be supplanted by internal organization. Recourse to the latter permits adaptations to uncertainty to be accomplished by administrative processes in a sequential fashion. Thus, rather than attempt to anticipate all possible contingencies from the outset, the future is permitted to unfold. Internal organization in this way economizes on the bounded rationality attributes of decision makers in circumstances in which prices are not "sufficient statistics" and uncertainty is substantial.[10] (Williamson 1975, p. 9.)

But Williamson's interest in coordination appears to have declined over time in favor of a greater preoccupation with incentive issues. Along with Benjamin Klein, Robert Crawford, and Alchian (1978), Williamson (1985) focused in on what has become perhaps the central concept in the present-day economics of organization: asset specificity. It is a concept that has apparently come

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[9] This type of coordination was strongly emphasized by Harold Malmgren (1961) in what is arguably the first "operationalization" of Coase (1937). Langlois and Metin Cosgel (1993) argue that this was also ultimately Frank Knight's explanation of the firm.

[10] What Williamson here means by prices not being "sufficient statistics" — a reference to his interpretation of Friedrich Hayek (1945) on the virtues of the price system — is that internal organization may be superior in situations requiring qualitative coordination, that is, the transmission and use of information beyond price and quantity.

to crowd out all others in the explanatory pantheon. "The main factor to which transaction-cost economics appeals to explain vertical integration," he now believes, "is asset specificity" (Williamson 1986, p. 189).

The logic is basically simple. Assets are highly specific when they have value within the context of a particular transaction but have relatively little value outside the transaction. This opens the door to opportunism. Once the contract is signed and the assets deployed, one of the parties may threaten to pull out of the arrangement — thereby reducing the value of the specific assets — unless a greater share of the quasi-rents of joint production find their way into the threat-maker's pockets. Fear of such "hold up" *ex post* will affect investment choices *ex ante*. In the absence of appropriate contractual safeguards,[11] the transacting parties may choose less specific — and therefore less specialized and less productive — technology. If, by contrast, the transacting parties were to pool their capital into a single enterprise in whose profits they jointly shared, the incentives for unproductive rent-seeking would be attenuated. And, because such unified organizations would choose the more productive specialized technology, they would win out in the competitive struggle against the contractual alternative.[12]

The explanation from asset specificity is at base an argument about the alignment of incentives, even if it ultimately rests on imperfect information. In a world of certainty and unrestricted cognitive ability (if one could imagine such a place), it would be easy to write and enforce long-term contracts that preempt *ex ante* unproductive rent-seeking behavior *ex post* and thus obviate internalization. This insight, indeed, has inspired one important formal strand of the literature.

The work of Oliver Hart and others (Sanford Grossman and Oliver Hart 1986; Oliver Hart 1995; John Moore 1992) — called the incomplete-contracts literature — distinguishes two types of rights under contract: specific rights and residual rights. The latter are generic rights to make production decisions in circumstances not spelled out in the contract. In this literature, the choice between contract and internal organization reduces to a question of the efficient allocation of the residual rights of control when contracts are incomplete and assets highly specific. Suppose there are two parties cooperating in production, each bringing to the arrangement a bundle of assets. If none of the assets is highly specific, opportunism is impossible *ceteris paribus*, as either party can liquidate at no or low cost as soon as troublesome unforeseen contingencies arise. If, however, assets are specific, or if opportunism becomes possible for other reasons, it may be efficient to place the residual rights of control in the hands of only one of the parties by giving that party

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[11] For example, a hostage. See Williamson (1985, chapters 7 and 8).

[12] This way of putting it gives an explicitly evolutionary spin to the functionalist argument more typical in transaction-cost economics. On this see Langlois (1984, 1986).

ownership of both sets of assets.[13] In general, the owner ought to be the party whose possession of the residual right minimizes rent-seeking costs, which typically means the party whose contribution to the quasirents of cooperation is greater.

This is all well and good as far as it goes, which, in some respects, is not nearly as far as the mainstream economics of organization seems to think. The emphasis in the literature on misaligned incentives obscures, in our view, the fundamental role that institutions (including the firm) play in qualitative coordination, that is, in helping cooperating parties to align not their incentives but their knowledge and expectations. All recognize that knowledge is imperfect and that most economically interesting contracts are, as a consequence, incomplete. But most of the literature considers seriously as coordinating devices only contracts and the incentives the embody. It thus neglects the role - the potentially far more important role - of routines and capabilities as coordinating devices. Moreover, the assumption that production costs are distinct from transaction costs and that production costs can and should always be held constant obscures the way productive knowledge is generated and transmitted in the economy.

We are not arguing that one should never make these assumptions or that one should never model problems of organization as largely problems of incentive alignment. But we are arguing that to translate these assumptions into an exclusive and near-universal research strategy arguably closes off a range of plausible alternative explanantions of the nature, boundaries, and internal structure of organizations.

A striking example of this incentive-oriented research strategy can be found in a recent paper by Julio Rotemberg and Garth Saloner (1994). They address one of the key ideas of the corporate strategy and capabilities literature, namely, that firms may be best off choosing narrow strategies. Specifically, Rotemberg and Saloner use the incomplete-contracts framework to argue that a firm may choose a narrow strategy (and thus ignore profitable opportunities) because strategic breadth leads to implementation problems *ex post* that distort *ex ante* incentives. They do note (p. 1131) that "increasing returns to specialization" (because of learning advantages from concentrating on well-defined capabilities) may be an independent reason for narrow strategies, but they do not investigate that possibility - because, we suggest, this would mean breaking with the heuristic of reducing all problems of economic organization to problems of aligning incentives. The problem is not that such reformulations in terms of incentives are internally inconsistent. Rather, the issue is whether the mechanisms so identified are in fact plausible explanations of the phenomena under study, a question that economists do not typically feel required to pose let alone

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[13] Hart and his colleagues hold that the possession of the residual rights of control necessitates ownership of the firm's capital assets, whether tangible or intangible. This allows them to do something few in the literature have been able to do: to define the boundaries of the firm crisply and consistently. For them, a firm is defined by the bundle of assets under common ownership. (This stands in contrast to the "nexus of contracts" view, which sees the firm as a far more fuzzy notion, and to the related principal/agent theory, in which it is not possible to assign alternative contractual arrangements to specific organizational structures: a contract between employer and employee is not necessarily different from a contract between a firm and its supplier).

answer. In fact, it is quite likely that the mechanisms underneath narrow firm strategies have little or nothing to do with the alignment of incentives, and have everything to do with limited knowledge and capabilities.

More generally, we are worried that conceptualizing all problems of economic organization as problems of aligning incentives not only misrepresents important phenomena but also hinders understanding other phenomena, such as the role of production costs in determining the boundaries of the firm. As we will argue, in fact, it may well pay off intellectually to pursue a research strategy that is essentially the flip-side of the coin, namely to assume that all incentive problems can be eliminated by assumption and concentrate on coordination (including communication) and production-cost issues only.

III. Production Costs Redux: Coordination and Capabilities

A. Key Ideas in the Capabilities Perspective

As we have suggested, there is now emerging a research approach that does emphasize issues of qualitative coordination and limited production knowledge.[14] We emphasize that talking about "a" or "the" capabilities perspective in any generic sense is very much in the nature of a reconstruction, since there are a number of strands of thought involved. Section IV will try to separate out those strands; for the moment, however, we will present the reconstructed version.

What may make it increasingly appropriate to speak of *a* capabilities perspective is that a small but growing list of authors has begun self-consciously referring to their work as lying within the confines of a "capabilities," "dynamic capabilities," or "competence" approach (Langlois 1992; Langlois and Paul Robertson 1995; Bruce Kogut and Udo Zander 1992; Nicolai Foss 1993; Giovanni Dosi and Luigi Marengo 1994; David Teece and Gary Pisano 1994). These contributions take somewhat different starting points. Thus, some begin from bounded rationality and other aspects of cognition and build up a theory of firm-specific knowledge - that is, capabilities - from this (e.g., Kogut and Zander 1992; Dosi and Marengo 1994), while others begin from the empirical generalization that productive knowledge is neither explicit nor freely transferable (*e.g.*, Langlois, 1992). Either way it boils down to the same common-sense recognition, namely that individuals — and organizations — are necessarily limited in what they know how to do well.[15] Indeed, the main interest of the capabilities view is to understand what is distinctive about firms as unitary, historical organizations of co-operating individuals. Moreover, it is becoming an increasingly widespread recognition among contributors to the capabilities view that approaching the firm in this way has fertile implications not only for understanding the sources of firm heterogeneity, competitive advantage, and differential rents (Steven Lippman and Richard Rumelt 1982; Birger Wernerfelt 1984) but also for advancing the economics of organization.

Michael Polanyi (1958) has taught us that knowledge is not all of a form that can be articulated in words or pictures for easy transmission. Much knowledge — including, importantly, much knowledge about production — is *tacit* and can be acquired only through a time-consuming process of learning by doing. Moreover, knowledge about production is often essentially

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[14] There is also a recent mainstream development that pursues a research strategy that is similar to this on the overall level, namely the attempt to conceptualize, on the basis of team-theory, the firm as a communication network (Patrick Bolton and Mathias Dewatripont 1994). We discuss the relation of this work to the capabilities perspective later.

[15] This was clearly the position of those classical economists, particularly Smith, who wrote on specialization. For a reading of the capabilities perspective as the modern heir to the classical theory of production, see Foss (1996c).

distributed knowledge, that is to say, knowledge that is only mobilized in the context of carrying out a multi-person productive task; is not possessed by any single agent, and normally requires some sort of qualitative coordination, for example, through direction and command, for its efficient use.[16] Indeed, capabilities are precisely characterized by these features: they may seen as team-embodied and partly tacit production and organization knowledge that can be operated by team-members for a strategic purpose.

In a world of tacit and distributed knowledge - that is, of differential capabilities - having the same blueprints as one's competitors is unlikely to translate into having the same costs of production.[17] Generally, in such a world, firms will not confront the same production costs for the same type of productive activity. Moreover, the costs that can make transacting difficult — the costs that may lead to internalization or various other business institutions — may go beyond those that arise in the course of safeguarding against opportunism or damping moral hazard through monitoring or incentive contracts. In such a world, economic activity may be afflicted with what one of us has called "dynamic transaction costs,"[18] the costs that arise in real time in the process of acquiring and coordinating productive knowledge (Langlois 1992; Langlois and Robertson 1995) and which are different in nature from the transaction costs that are caused by problems of aligning incentives. This, in turn, implies that the capabilities may be interpreted as a distinct theory of economic organization.

B. The Capabilities Perspective as a Theory of Economic Organization

A key implication of the capabilities perspective as it relates to economic organization is that, in the terminology of George B. Richardson (1972), the structure of complementarity and similarity among the various capabilities in the economy affects the pattern of organization (including the firm-market boundary) in ways not fully explicable in terms of the costs of transacting. Indeed, the ability to transact (and therefore the cost of transacting) is itself a capability (Winter 1988), which suggests a blurring of the boundary between production and exchange.

The idea that capabilities may be an independent causal factor behind the pattern of

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16 Of course, not all distributed knowledge requires conscious direction for its efficient utilization; in fact, it is a standard argument in favor of the market order that it better utilizes distributed knowledge than any known directed order (Friedrich Hayek 1945). However, as we shall later argue, firms may derive part of their *raison d'être* from their (sometimes) superior abilities to coordinate (some) types of distributed knowledge. Thus, what we are after is a knowledge-based theory of the existence and boundaries of the firm.

17 Indeed, having the same *equipment* may not guarantee the same production costs, as suggested by Polanyi's own example of the Hungarians unable to make function a light-bulb machine identical to one operating flawlessly in Austria.

18 Loosely, and perhaps somewhat cryptically, dynamic transaction costs are the costs of not having the capabilities you need when you need them (Langlois 1992).

economic organization has recently received support from the *doyen* of business historians, Alfred D. Chandler.[19] He traces the neglect of production in the post-Coase literature to its choice of the isolated transaction as unit of analysis. By contrast, "if the firm is the unit of analysis, instead of the transaction," Chandler says, "then the specific nature of the firm's facilities and skills becomes the most significant factor in determining what will be done in the firm and what by the market"[20] (Chandler 1992, p.86).

Even more striking, Ronald Coase himself has voiced similar views. Referring in a much later work (Coase 1990, p.11) to the 1937 article on "The Nature of the Firm," Coase (1991, p. 90) argues that,

> while transaction cost considerations undoubtedly explain why firms come into existence, once most production is carried out within firms and most transactions are firm-firm transactions and not factor-factor transactions, the level of transaction costs will be greatly reduced and the dominant factor determining the institutional structure of production will in general no longer be transaction costs but the relative costs of different firms in organizing particular activities.

However, it was British economist George Richardson who introduced the term "capabilities" to talk about the necessarily limited range of productive knowledge firms and individuals possess.[21] Taking issue with the representation of knowledge in the production-function approach, Richardson writes:

> Of course I realise that production functions presume a certain level of managerial and material technology. The point is not that production is thus dependent on the state of the arts but that it has to be undertaken (as Mrs. Penrose has so very well explained) by organisations embodying specifically appropriate experience and skill. It is this circumstance that formal production theory tends to put out of

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19 This may be contrasted with Chandler's earlier support for Williamson's brand of transaction cost economics. Chandler (1992, p.85) says that although he has "learned much from Williamson," there is a basic difference between them which has to do with the unit of analysis. Chandler goes on to endorse "the recently formulated evolutionary theory of the firm," which is roughly identical to the capabilities perspective.

20 Of course, taking the firm as the unit of analysis makes it difficult to study the rationale for and the boundaries of the firm. Langlois and Robertson (1995) suggest taking capabilities and routines as the fundamental units of analysis. This has the benefit of placing the economics or organization more firmly within the structure of the New Institutional Economics more broadly (Langlois 1986), in which norms and conventions — which, like routines, are rule-based guides to action — are the fundamental concepts.

21 Richardson's discussion of capabilities is clearly indebted to Edith Penrose (1959). In her theory, firms consist of acquired pools of resources — including, importantly, managerial resources — that come in lumpy bundles. In order to take advantage of excess capacity in some of the lumps, the firm may expand or diversify into areas in which that capacity is useful. Moreover, because of various ongoing learning processes - not the least in the management team - firms accumulate slack services which may also serve as platforms for diversification. This in turn may lead the firm to accumulate and/or acquire other complementary capabilities, which will lead to further excess capacity, etc.

> focus, and justifiably, no doubt, given the character of the optimisation problem that it is designed to handle; nevertheless, it seems to me that we cannot hope to construct an adequate theory of industrial organization and in particular to answer our question about the division of labour between firm and market, unless the elements of organisation, knowledge, experience and skills are brought back to the foreground of our vision. (Richardson 1972, p. 888).

In Richardson's terminology, production can be broken down into various stages or *activities*. Some activities are *similar*, in that they draw on the same general capabilities. Activities can also be *complementary* (in both a technical and an economic sense) in that they are connected in the chain of production and therefore need to be coordinated with one another. Juxtaposing different degrees of similarity against different degrees of complementarity produces a matrix that maps different types of economic organization. For example, closely complementary and similar activities may be best undertaken under unified governance.

Complementarity is clearly an increasingly important theme in today's economics of organization (Paul Milgrom and John Roberts 1990); indeed, there is a widespread recognition that "strongly complementary assets should be brought under common ownership" (Milgrom and Roberts 1992, p.312). But the real force of Richardson's argument is in quite a different direction. In Richardson, the import of the concept of capabilities was their *limitations*. Because of what are effectively cognitive constraints, all organizations must specialize; and, since the chain of production in an advanced economy requires a diversity of very different capabilities, the costs of integrating across many links in that chain are necessarily high, and firms must rely on various kinds of market and hybrid arrangements to coordinate their activities even in the face of contractual hazards.[22] Although transaction costs may outweigh the costs of dissimilarity in the case of some closely complementary activities, on the whole the limitations of capabilities outweigh transaction costs. As Brian Loasby (1991) has observed, Richardson thus stands on its head a principal, albeit tacit, presumption of transaction-cost economics, namely that, because contractual relationships among firms are fraught with hazards, integration must on the whole be relativley less costly and thus widely desirable.

Richardson's insight is a simple but extremely profound one. For it suggests that - as a

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[22] A related, if not identical, position has been adopted by David Teece (1982, 1986), one of the few major scholars to have incorporated Richardson's ideas. Unlike Richardson, who discusses the coordination of complementary *activities*, Teece talks about complementary *assets* that might be *cospecialized* to one another. As with Richardson's closely complementary activities, cospecialized assets may be difficult tto coordinate. But, unlike Richardson, Teece is inclined, with the broader incentive-based asset-specificity literature that has influenced him, to believe that cospecialized assets may be a cause of integration more than of cooperation, especially to the extent that integration allows an innovator to appropriate the gains from innovation in regimes in which intellectual property rights are ineffective. Thus, for Teece governance structures alternative to the market arise to prevent slippery innovative knowledge from escaping the grasp of its creators, just as, in the main current of the transaction-cost literature, alternative governance structures emerge to protect transactors from the "plasticity" of contract.

quite general matter - capabilities are determinants of the boundaries of the firm, since they determine, in Coase's words, "the relative costs of different firms in organizing particular activities." Problems of economic organization may crucially reflect the possibility that a firm may control production knowledge that is, in important dimensions, strongly different from what others control. Thus members of one firm may quite literally not understand what another firm wants from them (for example, in supplier contracts) or is offering them (for example, in license contracts). Because of the extreme specificity and tacitness of much productive knowledge, one firm may have difficulties understanding another firm's capabilities; and both firms separately and together may know more than their contracts can tell (Bruce Kogut and Udo Zander 1992; Sidney Winter 1993). In this setting, the costs of making contacts with potential partners, of educating potential licensees and franchisees, of teaching suppliers what it is one needs from them, etc., become very real factors determining where the boundaries of firms will be placed.

Note that these "dynamic transaction costs" (Langlois 1992) are in a different category from the transaction costs usually considered in the post-Coase literature. Transacting difficulties are not a matter of incentive problems within an otherwise well-defined and well-understood exchange context. Rather, coordination problems may arise because capabilities exhibit too much "friction": the knowledge, skills, and traditions embodied in existing governance structures (be they firms, markets, or in between) may be too inflexible, especially in the face of major "Schumpeterian" change, to seize market and technological opportunities. In such circumstances, other governance structures that can muster the necessary capabilities may arise and prosper.

Morris Silver (1984) has suggested, for example, that much vertical integration arises not when firms venture into areas of similar capabilities but when firms are dragged, kicking and screaming, as it were, into complementary but dissimilar activities because only in that way can they bring about a profitable reconfiguration of production or distribution. Langlois and Robertson (1995) build a broad theory of industrial dynamics around this idea. The organizational question is whether new capabilities are best acquired through the market, through internal learning, or through some hybrid organizational form. And the answer will depend on (A) the already-existing structure of capabilities and (B) the nature of the economic change involved.

If a profit opportunity requires a configuration of capabilities different from what already exists in the economy, then a Schumpeterian process of creative destruction may be set in motion. If the old configuration of capabilities is decentralized into what we may loosely call markets, then a reorganization within a single organization — vertical integration — may most cheaply bring about the necessary redeployment. If, by contrast, the old configuration of capabilities lies within large vertically integrated organizations, creative destruction may well take the form of markets superseding firms. History offers many examples of both.

The organizational possibilities are tempered by the nature of the reconfiguration required. If change is *systemic* — if it requires simultaneous change in many parts of a complex system — internal organization may prove less costly *ceteris paribus*. If, however, change is *autonomous* —

if change can take place in separate subsystems without greatly affecting the way those subsystems are connected together — then markets, which can take advantage of specialized and decentralized knowledge, may be at a relative advantage. Here the issue of standards enters the picture: for standards are typically ways of fixing the connections among subsystems so that change is channeled in autonomous directions. Langlois and Robertson (1992, 1995) call this kind of structure a *modular system*.

The upshot of all this, we suggest, is that there now exists a distinct basis - a collection of ideas, concepts and mechanisms - for the capabilities view as a theory of economic organization, at least with respect to the boundaries of the firm. But what about the empirical evidence? Writers like Chandler (1962, 1977, 1990, 1992), Lazonick (1991), and Langlois and Robertson (1995) enlist economic and business history in support of a capabilities view. But more quantitative empirical studies also suggest that differential capabilities, and therefore production costs, are significant variables for explaining the boundaries of the firm. In Graham Walker and Donald Weber's (1984) empirical study of the make-or-buy decision, the most important explanatory variable turned out to be the indicator for differential firm capabilities, that is, for production costs. And, in a study by Kirk Monteverde and David Teece (1982), which set out to find support for the standard contractual approach, the most significant variable was actually the dummy for the firm, reflecting heterogenous and unobserved firm effects (Kogut and Zander 1992, p. 394).

IV. Capabilities and Contemporary Research Themes

In this section, we discuss how the capabilities perspective relates to a variety of streams of thought originating from a variety of problems. Just as the post-Coase literature on the economics of organization has not been developed in an intellectual vacuum, so the capabilities perspective very much reflects a number of diverse influences. And, although the roots of the capabilities approach stretch quite far back in history, and although - until recently - the various influences have been developed independently, the emergence of the capabilities perspective seems in fact to mark a growing realization of the possibilities of convergence. Thus, we wish to provide a brief conspectus of the sources of the capabilities aproach; of the many intellectual alliances that this perspective has struck or may strike; and of the work of a number of researchers who have been involved in developing capabilities insights.

What we have said so far about the post-Coase literature on the economics of organization also makes it obvious and necessary to undertake a more detailed discussion of how the capabilities perspective relates to this literature. But there are numerous other connections: to strategic management and organizational learning; to business history; to the economics of technology; to evolutionary economics; and to the economics of institutions.

A. Antecedent and Related Fields

How can firms make best use of their distinctive capabilities? How have they done this in the past? And how can they go on developing new valuable capabilities? Such questions have been central in the strategy field since its inception at the end of the 1950s, and in the related field of business history, at least since Alfred D. Chandler's (1962) demonstration of the importance of organizational capabilities to the restructuring of the American economy that began in the middle of the last century. This three-decades-long interest in capabilities should be contrasted with the lack of interest shown by economists, at least until recently.

The conceptualization of the firm that underlies this work was perhaps best expressed in the late Edith Penrose's *The Theory of the Growth of the Firm* (1959), a conceptualization she explicitly differentiated from the prevailing production-function view. "The firm," Penrose says, "is ... a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision" (Penrose 1959, p. 24). Now, resources in Penrose's view yield services, and it is these services - clearly a theoretical precursor to the concept of capabilities - that interest her the most. Because resources/services become specialized to firms - and mesh with each other in a team-like manner - they are worth more to the firm than to the

market (meaning other firms). They therefore yield quasi-rents, some of which may be appropriated by the firm's owners. Moreover, although resources/services are firm-specific, they are nevertheless somewhat "fungible" inside the firm, and, when in excess, provide a stepping-stone for diversifying to new markets.

Penrose's work helped define at least three distinct areas of research. The first one partially stems from her insistence that specialized resources/services yield rents; this has helped found what is today referred to as the *resource-based perspective* in contemporary firm-strategy research (Steven Lippman and Richard Rumelt 1982; Birger Wernerfelt 1984). The primary contribution associated with the resource-based perspective is a thorough analysis of the conditions under which resources yield rents. Thus, heterogeneous, immobile and hard-to-imitate resources that are, moreover, acquired in imperfect factor markets (so that there may be a difference between the price of the resource and its value to an acquiring firm) are rent-yielding strategic assets to firms.

A second relevant area of research is the study of *diversification* (e.g. David Teece 1982; Giovanni Dosi, David Teece, Sidney Winter 1992), where Penrose's notion of excess capabilities, combined with transaction-cost considerations, is perhaps the dominant mode of explanation (Cynthia Montgomery 1994). Roughly speaking, the story is this. As firms carry on their normal business, they are likely to accumulate excess resources, for example, excess managerial capabilities. In principle, rents from these resources may be captured in different ways, for example, through market exchange, long-term contracts, or in-house use. Because of transaction-cost problems, which may be particularly severe when the excess resources involved are knowledge resources, in-house use is more efficient, and the firm will accordingly apply the resources that are in excess to neighboring markets.

The third area of research that Penrose's work helped to establish is the study of *organizational learning*, which also owes a heavy debt to such seminal contributions to organization theory as James March and Herbert Simon (1958) and Richard Cyert and March (1963). Penrose argued that the management team holds *images* of the external environment and of the firm's internal resources; that these images are produced through internal learning processes; and that they determine "the productive opportunity set" of the firm, that is, the productive possibilities that that the firm's "'entrepreneurs' see and can take advantage of" (Penrose 1959, p.31).

The idea of the image as a shared firm-specific vision, and the implication that firms are in essence cognitive communities, is more radical than the - now more standard - ideas of bounded rationality and tacit knowledge in action or of firms as essentially processors of (objective)

information (Martin Fransman 1994).[23] And, with the possible exception of Kenneth Arrow (1974), Brian Loasby (1976), and Jacques Crémer (1990), few economists have shown interest in Penrose's idea, although it is standard in contemporary organization theory (James March 1988). The image is more radical because it explicitly recognizes that agents have to make sense of their world, that agents' cognitive development is molded in social processes, and because it implies that tacitness is an aspect of virtually all acts of interpretation and meaning attribution (Marengo, 1995). In this view, the essence of decision making is not making a choice among pre-given alternatives; it is a matter of construing something resembling a decision situation by defining which variables are relevant, which in turn requires making sense of the environment, setting up procedures for solving the problem, etc.

Clearly, such a view of decision-making emphasizes the importance of coordination problems, but also points to a coordinative role for capabilities. As Langlois (1984) and Luigi Marengo (1995) argue, if agents entering the firm held the completely same habits of thought/models of the world, the only obstacle to efficient coordination of their actions would be precisely the sort of incentive problems that preoccupy modern organizational economists. However, in a world in which agents do not share exactly the same models and do not know each others' models, a collective knowledge base is required for coordination (Jacques Crémer 1990).

As simulations built on the theory of classifier systems demonstrate (John Holland and John Miller 1991), such a knowledge base may develop as a result of organizational learning under rather general assumptions (Marengo 1995). These attempts to construct a theory of capabilities from ideas about behavior founded in organization theory rather than in maximizing behavior currently enjoys much attention among evolutionary economists, particularly among Italian and French ones (*e.g.*, Giovanni Dosi and Luigi Marengo 1994). The basic idea, however, can be found in Richard Nelson and Sidney Winter's *An Evolutionary Theory of Economic Change* (1982), particularly chapter 4 and 5. Their widely cited analysis of "routines" builds directly on behavioralist organization theory, as well as on Michael Polanyi's (1958) analysis of tacit knowledge. In fact, this analysis is itself an important precursor of modern work on capabilities.

In the evolutionary economics of Nelson and Winter (1982) and many (other) economists associated with the International Joseph A. Schumpeter Society, the capabilities view of the firm serves primarily as a micro-foundation for population-level analysis of industry and technology evolution. Thus, the capabilities perspective helps rationalize the variety of behaviors - including innovative behaviors - that are necessary in any evolutionary account of industry and technology evolution (J. Stanley Metcalfe 1989); it is an explanatory component in a broader explanation, much like the way in which the neoclassical theory of the firm is basically an explanatory

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[23] Langlois (1996) has argued that the set of capabilities available to an organization, and the way in which those capabilities are arranged, constitute the organization's cognitive structure, that is, its mechanism for perceiving technological and market opportunities. Thus, knowledge within the organization is perhaps even more widely distributed and variegated that the notion of an "image" suggests, and is not always confined to management.

component in standard price-theory.

However, there has been some important work on innovation and technological change that puts the emphasis on the firm level rather than the population/industry level. Much of this has been associated with University of Sussex Science Policy Research Unit (SPRU) and with members of the (University of) Reading school of international business, particularly John Cantwell (1994). For example, recent influential work by Keith Pavitt and Pari Patel (Patel and Pavitt 1994) use systematic information on American patenting by more than 400 of the world's largest technologically active firms to demonstrate that the accumulation of technological capabilities is strongly path-dependent and that there are therefore severe limits on the range of exploitable technological opportunities. Moreover, they argue that technological capabilities "give a convincing empirical explanation of the boundaries (or - perhaps better - the *core* activities) of firms (p. 2). In other words, like many other proponents, Pavitt and Patel see the capabilities perspective as - at least potentially - an *alternative* theory of economic organization. We treat this issue in further detail in the next section.

B. The Capabilities Perspective and the Modern Economics of Organization

We have interpreted the capabilities perspective as reaching for a distinct theory of economic organization, one that is based on a conceptualization of the firm as a repository of productive knowledge with certain non-standard characteristics, what we have here called "capabilities." In this story, incentive issues are suppressed in favor of a focus on problems of coordinating knowledge and expectations. We have chided the profession for its lopsided choice of the opposite approach and for its dramatic overemphasis on transaction costs and incentive alignment, to the exclusion of production costs and issues of coordination, in explaining economic organization.

However, there has recently been some stimulating work that explicitly focuses on the coordination of knowledge and expectations in a team-theoretic framework (Kenneth Arrow 1985; Jacques Crémer 1990; Roy Radner 1992, 1996; Patrick Bolton and Matthias Dewatripont 1994). In these models, incentives move into the background. Building on earlier ideas by Jacob Marschak and Roy Radner (1972) and Kenneth Arrow (1974), these writers view the firm as a communication network that is designed to minimize both the cost of processing new information and the costs of communicating this information among agents. Communication is costly because it takes time for agents to absorb new information sent by others, but this time may be reduced by specializing in the processing of particular types of information. In Bolton and Dewatripont's (1994) model, for example, each agent handles a particular type of information, and the different types of information are aggregated through the communication network. When the benefits to specializing outweigh the costs of communication, teams (firms) arise.

Arguably, such work captures some of the main ideas of the capabilities perspective as we have interpreted it; for example, there is an emphasis on the need for qualitative coordination, on specialization in handling knowledge, on firm-specific "codes" of communication (Arrow 1974), and on bounded rationality (Radner 1996). We conjecture that this work will become increasingly important as first steps towards the formalization of capabilities ideas.

In spite of this conjecture, one should not reject the more standard incentive-oriented work as a natural complement to the capabilities view. In fact, future work may center around modelling capabilities and incentive considerations in the *same* model,[24] so that, for example, the role of *both* production costs and transaction costs in determining the boundaries of the firm becomes more visible than it is in the post-Coase literature on the economics of organization. In this respect, it is noteworthy that Oliver Williamson's primary design principle for efficient economic organization has been changed to reflect capabilities considerations: "Align transactions, which differ in their attributes, with governance structures, which differ in their costs and competencies in a discriminating (mainly, transaction cost economizing) way" (Williamson 1991, p. 79). Thus, Williamson now thinks of competencies (*i.e.*, capabilities) as determinants of governance more-or-less on a par with transaction costs. In other words, the notion of the firm as a bundle of capabilities may harmonize with key ideas of the post-Coase literature. An excellent specific example is a model by Tracy Lewis and David Sappington (1991). They analyze the firm's make-and-buy decision uder the assumption that its subcontractor is known to have lower innate production costs (i.e., superior capabilities) *but* the firm is better able to monitor and control its own production activities. Lewis and Sappington perform various comparative-static exercises in this setting; for example, they examine how the firm's boundaries choice varies with technological change that influences production costs and monitoring, so that both incentive and capabilities considerations are allowed to enter the picture.

In the following, we briefly present a few further suggestions as to how, more specifically, key ideas from the two perspectives may be aligned.[25] These suggestions keep intact the basic idea that economic organization is first and foremost a matter of efficiently aligning incentives; capabilites considerations merely serve to help extend the applicability of this basic idea. This is an interesting and legitimate research strategy, as long as we do not forget to also consider the other side of the coin: that capabilities considerations may be primary and incentive considerations secondary.

Capabilities and intra-firm agency problems. The argument here is that capabilities in firms may influence the outcomes of principal-agent-type problems: firms will often be characterized by a distinct "way of doing things" that is coded in its capabilities and is shared among input-owners. Precisely because it is shared (common), the presence of such knowledge

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[24] Promising recent work by Philippe Aghion and Jean Tirole (1995) incorporates both incentive considerations and information-processing considerations that are akin to the thrust of the capabilities view.

[25] For a fuller discussion of the issues involved here, see Foss (1996b).

may serve to mitigate moral hazard and adverse-selection problems.[26] This is a possible interpretation of why corporate cultures may be valuable assets to firms.[27]

Moreover, such an capabilities-*cum*-agency problems story also helps to rationalize the *scope* of firms: casual empiricism confirms that few firms have integrated the entire value-chain and that no firm has a stake in every product market in the economy, the common explanation being that firms confront increasingly *dissimilar* capabilities as they move away from their core business (Richardson 1972). A rendering along the lines of the modern economics of organization may be: as firms move increasingly away from their core businesses, they confront increasing adverse-selection and moral-hazard problems, since management becomes increasingly unable efficiently to monitor employees or to evaluate their human capital. Agency costs rise correspondingly, producing the net profitability disadvantage associated with further integration (for a similar story, see Philippe Aghion and Jean Tirole 1994).

Capabilities and Incomplete Contracts. In the presence of incomplete contracts and bounded rationality, something more than an allocation of rights is required to structure intra-firm interaction; firms aren't held together solely by the thin glue of transaction-cost minimization, but rather by the thicker glue of capabilities. A key aspect of the capabilities critique of the modern economics of organization is that it too strictly dichomotizes production and organization/exchange considerations when in reality these are closely intertwined. Since the very notion of firm capability combines production and organization considerations, it is entirely likely that capabilities embodying knowledge about production at least to some extent also help solve problems of rent-seeking inside organizations.

Asset specificity and capabilities. As we have argued, the notion of specific assets is key to the modern economics of organization (but see Harold Demsetz 1988). Not surprisingly, elaborate lists of types of specific assets have been constructed, ranging from patents over dedicated physical equipment to site specificity (Williamson 1985; Grossman and Hart 1986).

Capabilities would certainly seem to qualify as specific assets - they are specialized to firms; they have low (or no) value in alternative uses; managers/owners can hold residual rights as to their use, etc. But the modern economics of organization does not normally view them that way (Klein (1988) and Milgrom and Roberts (1992) are exceptions).[28] Part of the reason may be that capabilities are hard to treat in formal models. Another part may be that it is harder to reason

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[26] There is, however, also a conflict between the agency view and the capabilities perspectives. In the first, heterogeneity of knowledge, preferences and behaviors is problematic because it causes agency problems; in the latter, it is beneficial, because it stimulates organizational learning and the development of capabilities.

[27] See Kreps (1990) for a slightly different interpretation

[28] This does not automatically mean, however, that capabilities are necessarily and under all circumstances best governed internally. Apart from the issue that a capability may be too dissimilar relative to an organization's other capabilities and is therefore best left to other firms (Richardson 1972), there is the issue that capabilities may exist on the industry-level as Marshallian external economies (see Langlois and Robertson 1995, 1996; Foss 1996d).

about who captures rents from capabilities than from ordinary factors of production; the underlying bargaining would seem to be immensely more complicated than the bargaining game being played between the firm and the owner of an ordinary human-capital input. However, these difficulties are not insurmountable in principle, and capabilities deserve a place on the short-list of empirically important specific assets.

V. Conclusion

Our aim in this paper has been to document the importance of the capabilities perspective as an emerging perspective on economic organization. It is characterized by distinct insights, not the least the attempt to restore production and production costs to their rightful place as determinants of the boundaries of the firm, and to find a place for qualitative coordination in the theory of economic organization. In other words, the capabilities perspective highlights explanatory mechanisms that are different from those of the post-Coase literature on economic organization. Since the two perspectives may be read as addressing the same sort of phenomena - notably the existence, boundaries and internal organization of the firm - and employ theoretical concepts and mechanisms (incentives vs qualitative coordination, blueprint knowledge vs capabilities, etc.), they may therefore be interpreted as being competitors. Although the capabilities view is admittedly less advanced than the post-Coase literature in terms of formalization and terminological stringency, with respect to some important phenomena - notably the boundaries of firms - the capabilities perspective, we have argued, develops more *plausible* explanatory mechanisms.

However, rather than stressing rivalry, we emphasize the complementarity between the two perspectives and the need for more integrative efforts. Even if it is not currently fashionable among contributors to the capabilities perspective, we feel that there are strong arguments in favor of our position. Both perspectives may benefit from the ideas and insights of the other. There is important mainstream work that, if in no way identical to the capabilities view, nevertheless suggests how aspects of capabilities ideas may be formally approached and modeled (Lippman and Rumelt 1982; Arrow 1985; Bolton and Dewatripont 1994; Aghion and Tirole 1994).

Moreover, when it comes to providing convincing stories about important empirical phenomena, the relations of complementarity between the post-Coase literature and the capabilities view may appear even more striking. For example, it is arguably hard to provide convincing stories about diversification (Teece 1982; Dosi, Teece and Winter 1992) or the organization of the innovation process (Teece 1986) without relying on *both* perspectives. For these reasons, the perspectives need to be integrated further. We therefore concur with one of the major scholars in today's economics of organization when he observes that "[i]n order to fully develop its capabilities, transaction cost economics must be joined with a theory of knowledge and production (Teece 1990, p. 59). And, in fact, the reverse may also hold true, that in order to fully develop its capabilities, the capabilities view must be joined with transaction cost economics. For example, in order to understand the process of emergence and accumulation of capabilities, we need to pay attention to the incentive structure of firms, since this influences investments in human capital. In sum, whether we see it from the perspective of the capabilities perspective or from the perspective of the modern economics of organization, there is an exciting theoretical frontier ahead.

Bibliography

Aghion, Philippe, and Jean Tirole. 1995. "Some Implications of Growth for Organizational Form and Ownership Structure," *European Economic Review* **39**: 440-455.

Alchian, Armen A., and Harold Demsetz. 1972. "Production, Information Costs, and Economic Organization," *American Economic Review* **62**(5): 772-795.

Alchian, Armen A., and Susan Woodward. 1988. "The Firm Is Dead; Long Live the Firm: A Review of Oliver E. Williamson's *The Economic Institutions of Capitalism*," *Journal of Economic Literature* **26**(1): 65-79 (March).

Arrow, Kenneth J. 1974. *The Limits of Organization,* New York: Norton.

Arrow, Kenneth J. 1985. "The Informational Structure of the Firm," *American Economic Review* **75**: 303-307.

Barzel, Yoram. 1987. "The Entrepreneur's Reward for Self-Policing," *Economic Inquiry* **25**: 103-116.

Bolton, Patrick, and Mathias Dewatripont. 1994. "The Firm as a Communication Network," *Quarterly Journal of Economics*, **115**, 809-839.

Cantwell, John. 1994. *Transnational Corporations and Innovatory Activities*. London: Routledge.

Chandler, Alfred D., Jr. 1962. *Strategy and Structure*. Cambridge: MIT Press.

Chandler, Alfred D., Jr. 1977. *The Visible Hand: the Managerial Revolution in American Business.* Cambridge: the Belknap Press of Harvard University Press.

Chandler, Alfred D., Jr. 1990. *Scale and Scope: the Dynamics of Industrial Capitalism.* Cambridge: the Belknap Press of Harvard University Press.

Chandler, Alfred D., Jr. 1992. "Organizational Capabilities and the Theory of the Firm," *Journal of Economic Perspectives* **6**(3): 79-100.

Coase, Ronald H. 1937. "The Nature of the Firm," *Economica* (N.S.) **4**: 386-405 (November).

Coase, Ronald H. 1937-38. "Some Notes on Monopoly Price," *Review of Economic Studies* **5**: 17-31.

Coase, Ronald H. 1960. "The Problem of Social Cost," *Journal of Law and Economics* **3**: 1-44.

Coase, Ronald H. 1972. "Industrial Organization: A Proposal for Research," in V. R. Fuchs, ed., *Policy Issues and Research Opportunities in Industrial Organization*. New York: NBER.

Coase, Ronald H. 1988. "The Nature of the Firm: Origin, Meaning, Influence," *Journal of Law , Economics and Ortganization* **4**(1): 3-47.

Coase, Ronald H. 1990. “Accounting and the Theory of the Firm,” *Journal of Accounting and Economics* **12**: 3-13.

Crémer, Jacques. 1990. “Common Knowledge and the Coordination of Economic Activities,” in Masahiko Aoki, Bo Gustaffson and Oliver E. Williamson, eds., *The Firm as a Nexus of Treaties*. London: Sage.

Cyert, Richard M., and James G. March. 1963. *A Behavioral Theory of the Firm.* Englewood Cliffs: Prentice-Hall.

Demsetz, Harold. 1988. “The Theory of the Firm Revisited,” *Journal of Law, Economics, and Organization* **4**(1): 141-161 (Spring).

Dosi, Giovanni, Sidney G. Winter, and David J. Teece. 1992. “Towards a Theory of Corporate Coherence,” in Giovanni Dosi, Roberto Giannetti and Pier-Angelo Toninelli. *Technology and Enterprise in a Historical Perspective*. Oxford: Clarendon Press.

Dosi, Giovanni, and Luigi Marengo. 1994. “ Some Elements of an Evolutionary Theory of Organizational Competences,” in Richard W. Englander. *Evolutionary Concepts in Contemporary Economics*. Ann Arbor: University of Michigan Press.

Flaherty, M.-Thérèse. 1980. “Industry Structure and Cost-Reducing Investment,” *Econometrica* **48**: 1187-1210.

Foss, Nicolai J. 1993. “Theories of the Firm: Contractual and Competence Perspectives,” *Journal of Evolutionary Economics* **3**: 127-144.

Foss, Nicolai J. 1996a. “The ‘Alternative’ Theories of Knight and Coase, and the Modern Theory of the Firm,” *Journal of the History of Economic Thought* **18**: 76-95.

Foss, Nicolai J. 1996b. “Capabilities and the Theory of the Firm,” forthcoming in *Revue d’Economie Industrielle.*

Foss, Nicolai J. 1996c. “The Classical Theory of Production and The Capabilities Perspective,” forthcoming in *Journal of Economic Studies*.

Foss, Nicolai J. 1996d. “Higher-Order Capabilities and Competitive Advantage,” forthcoming in *Journal of Industry Studies*.

Fransman, Martin. 1994. “Information, Knowledge, Vision, and Theories of the Firm,” *Industrial and Corporate Change* **3**: 713-757.

Grossman, Sanford, and Oliver Hart. 1986. “The Costs and Benefits of Ownership: A Theory of Vertical Integration,” *Journal of Political Economy* **94:** 691-719

Hart, Oliver D. 1989. “An Economist's Perspective on the Theory of the Firm,” *Columbia Law Review* **89**(7): 1757-1774.

Hart, Oliver D. 1995. *Firms, Contracts, and Financial Structure*. Oxford: The Clarendon press.

Hayek, Friedrich A. 1945. "The Use of Knowledge in Society," *American Economic Review* **35**(4): 519-530.

Holland, John H. and John H. Miller. 1991. "Artificial Adaptive Agents in Economic Theory," *American Economic Review, Papers and Proceedings* **81**: 365-370.

Holmström, Bengt, and Jean Tirole 1989. "The Theory of the Firm," in Richard Schmalensee and Robert D. Willig, eds., *Handbook of Industrial Organization, Vol. 1*. Amsterdam: North-Holland, 1989.

Klein, Benjamin. 1988. "Vertical Integration as Organization Ownership," *Journal of Law, Economics, and Organization* **4**(1): 199-213 (Spring).

Klein, Benjamin, Robert G. Crawford, and Armen Alchian 1978. "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics* **21**(2): 297-326.

Kogut, Bruce, and Udo Zander. 1992. "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology," *Organization Science* **3**: 383-397.

Kreps, David M. 1990, "Corporate Culture and Economic Theory," in James Alt and Kenneth Shepsle. *Perspectives on Positive Political Economy*. New York: Cambridge University Press.

Langlois, Richard N. 1984. "Internal Organization in a Dynamic Context: Some Theoretical Considerations," in M. Jussawalla and H. Ebenfield, eds., *Communication and Information Economics: New Perspectives.* Amsterdam: North-Holland, pp. 23-49.

Langlois, Richard N. 1986. *Economics as a Process: Essays in the New Institutional Economics.* New York: Cambridge University Press.

Langlois, Richard N. 1992. "Transaction-cost Economics in Real Time," *Industrial and Corporate Change* **1**(1): 99-127.

Langlois, Richard N. 1996. "Cognition and Capabilities: Opportunities Seized and Missed in the History of the Computer Industry," in Raghu Garud, Praveen Nayyar, and Zur Shapira, eds., *Technological Entrepreneurship: Oversights and Foresights.* New York: Cambridge University Press

Langlois, Richard N., and Metin M. Cosgel. 1993. "Frank Knight on Risk, Uncertainty, and the Firm: A New Interpretation," *Economic Inquiry* **31:** 456-465 (July).

Langlois, Richard N., and Roger G. Koppl. 1991. "Fritz Machlup and Marginalism: A Reevaluation," *Methodus* **3**(2): 86-102 (December).

Langlois, Richard N, and Paul L. Robertson. 1995. *Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions.* London: Routledge.

Langlois, Richard N, and Paul L. Robertson. 1996. "Stop Crying over Spilt Knowledge: A Critical Look at the Theory of Spillovers and Technical Change," paper presented at the MERIT conference on Innovation, Evolution and Technology, August 25-27, 1996, Maastricht, the Netherlands.

Lazonick, William. 1991. *Business Organization and the Myth of the Market Economy*. New York: Cambridge University Press.

Lewis, Tracy, and David Sappington. 1991. "Technological Change and the Boundaries of the Firm," *American Economic Review* **81**: 887-900.

Lippman, Steven A., and Richard P. Rumelt. 1982. "Uncertain Imitability: An Analysis of Interfirm Differences in Efficiency Under Competition," *Bell Journal of Economics* **13:** 418-438.

Loasby, Brian J. 1976. *Choice, Complexity, and Ignorance*. Cambridge: Cambridge University Press.

Loasby, Brian J. 1989. *The Mind and Method of the Economist*. Aldershot: Edward Elgar.

Loasby, Brian J. 1991. *Equilibrium and Evolution: An Exploration of Connecting Principles in Economics*. Manchester: Manchester University Press.

Loasby, Brian J. 1995. "Running a Business: An Appraisal of *Economics, Organization and Management* by Paul Milgrom and John Roberts," *Industrial and Corporate Change* **4**(2): 471-489.

Machlup, Fritz. 1967. "Theories of the Firm: Marginalist, Behavioral, Managerial," *American Economic Review* **57:** 1-33.

Malmgren, Harold B. 1961. "Information, Expectations, and the Theory of the Firm," *Quarterly Journal of Economics* **75**: 399-421.

March, James G. and Herbert A. Simon. 1958. *Organizations*. New York: Wiley.

March, James G. 1988. *Decisions and Organizations*. Oxford: Basil Blackwell.

Marengo, Luigi. 1995. "Structure, Competence, and Learning in Organizations," *Wirtschaftspolitische Blätter* **6**: 454-464.

Marschak, Jacob, and Roy Radner. 1972. *The Economic Theory of Teams.* New Haven: Yale University Press.

Metcalfe, John Stanley. 1989. "Evolution and Economic Change," in Aubrey Silberston. *Technology and Economic Progress*. Basingstoke: Macmillan.

Milgrom, Paul J., and John D. Roberts. 1988. "Economic Theories of the Firm: Past, Present, and Future," *Canadian Journal of Economics* **21**: 444-458.

Milgrom, Paul J., and John D. Roberts. 1990. "The Economics of Modern Manufacturing: Technology, Strategy, and Organization," *American Economic Review* **80**: 511-528.

Milgrom, Paul J., and John D. Roberts. 1992. *Economics, Organization, and Management*. New York: Prentice Hall.

Monteverde, Kirk, and David J. Teece. 1982. "Supplier Switching Costs and Vertical Integration in the Automobile Industry," *Bell Journal of Economics* **13**: 206-213.

Montgomery, Cynthia A. 1994. "Corporate Diversification," *Journal of Economic Perspectives* **8**: 163-178.

Moore, John. 1992. "The Firm as a Collection of Assets," *European Economic Review* **36**: 493-507.

Moss, Scott. 1984. "The History of the Theory of the Firm from Marshall to Robinson and Chamberlin: the Source of Positivism in Economics," *Economica* **51**: 307-318.

Nelson, Richard R. 1991. "Why Do Firms Differ, and How Does It Matter?" *Strategic Management Journal* **12**: 61-74.

Nelson, Richard R., and Sidney G. Winter. 1982. *An Evolutionary Theory of Economic Change*. Cambridge: Harvard University Press.

Nelson, Richard R., and Howard Pack. 1996. "Firm Competences, Technological Catchup, and the Asian Miracle," paper presented at the International Joseph A. Schumpeter Society meeting, June, Stockholm.

Penrose, Edith T. 1959. *The Theory of the Growth of the Firm*. Oxford: Basil Blackwell.

Patel, Pari, and Keith Pavitt. 1994. "Technological Competencies in the World's Largest Firms," *Working Paper*, Science Policy Research Unit, University of Sussex.

Polanyi, Michael. 1958. *Personal Knowledge*. Chicago: University of Chicago Press.

Radner, Roy. 1992. "Hierarchy: the Economics of Managing," *Journal of Economic Literature* **30**: 1382-1415.

Radner, Roy. 1996. "Bounded Rationality, Indeterminacy, and the Theory of the Firm," *The Economic Journal* **106:** 1360-1373.

Richardson, G. B. 1960 [1990]. *Information and Investment.* Oxford: Oxford University Press.

Richardson, G. B. 1972. "The Organisation of Industry," *Economic Journal* **82**: 883-96.

Riordan, Michael, and Oliver E. Williamson. 1985. "Asset Specificity and Economic Organization," *International Journal of Industrial Organization* **3**: 365-378.

Robinson, Joan. 1956. *The Accumulation of Capital*. London: Macmillan.

Rosenberg, Nathan. 1982. *Inside the Black Box*. Cambridge: Cambridge University Press.

Rotemberg, Julio J., and Garth Saloner. 1994. "Benefits of Narrow Business Strategies," *American Economic Review* **84**(5): 1330-1349 (December).

Silver, Morris. 1984. *Enterprise and the Scope of the Firm*. Aldershot: Martin Robertson.

Simon, Herbert A. 1957. *Models of Man.* New York: John Wiley.

Teece, David J. 1982. "Towards an Economic Theory of the Multiproduct Firm," *Journal of Economic Behavior and Organization* **3**(1): 39-63.

Teece, David J. 1986. "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy," *Research Policy* **15**: 285-305.

Teece, David J. 1990. "Contributions and Impediments of Economic Analysis to the Study of Strategic Management," in James M. Frederickson 1990. *Perspectives on Strategic Management*. Grand Rapids: Harper Business.

Teece, David J., and Gary Pisano. 1994. "The Dynamic Capabilities of Firms: an Introduction," *Industrial and Corporate Change* **3**(3): 537-556.

Tirole, Jean. 1988. *The Theory of Industrial Organization*. Cambridge: MIT Press.

Walker, Graham, and Donald Weber. 1984. " Transaction Cost Approach to the Make or Buy Decision," *Administrative Science Quarterly* **29**: 373-391.

Wernerfelt, Birger. 1984. "A Resource-Based View of the Firm," *Strategic Management Journal* **5**: 171-180.

Williamson, Oliver E. 1971. "The Vertical Integration of Production: Market Failure Considerations," *American Economic Review* **61**: 112-123.

Williamson, Oliver E. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications.* New York: The Free Press.

Williamson, Oliver E. 1985. *The Economic Institutions of Capitalism.* New York: The Free Press.

Williamson, Oliver E. 1986. "The Economics of Governance: Framework and Implications," in R. N. Langlois, ed., *Economics as a Process: Essays in the New Insitutional Economics.* New York: Cambridge University Press.

Williamson, Oliver E. 1988. "Technology and Transaction Cost Economics: A Reply," *Journal of Economic Behavior and Organization* **10***:* 355-363.

Williamson, Oliver E. 1991. "Strategizing, Economizing, and Economic Organization," *Strategic Management Journal* **12**: 75-94.

Williamson, Oliver E. 1993. "The Evolving Science of Organization," *Journal of Institutional and Theoretical Economics* **149**(1): 36-63 (March).

Winter, Sidney G. 1993. "On Coase, Competence, and the Corporation," *Journal of Law, Economics, and Organization* **4**(1): 163-180 (Spring)

Danish **R**esearch **U**nit for **I**ndustrial **D**ynamics

The Research Programme

The DRUID-research programme is organised in 3 different research themes :

- The firm as a learning organisation

- Competence building and inter-firm dynamics

- The learning economy and the competitiveness of systems of innovation

In each of the three areas there is one strategic theoretical and one central empirical and policy oriented orientation.

Theme A: The firm as a learning organisation

The theoretical perspective confronts and combines the ressource-based view (Penrose, 1959) with recent approaches where the focus is on learning and the dynamic capabilities of the firm (Dosi, Teece and Winter, 1992). The aim of this theoretical work is to develop an analytical understanding of the firm as a learning organisation.

The empirical and policy issues relate to the nexus technology, productivity, organisational change and human ressources. More insight in the dynamic interplay between these factors at the level of the firm is crucial to understand international differences in performance at the macro level in terms of economic growth and employment.

Theme B: Competence building and inter-firm dynamics

The theoretical perspective relates to the dynamics of the inter-firm division of labour and the formation of network relationships between firms. An attempt will be made to develop evolutionary models with Schumpeterian innovations as the motor driving a Marshallian evolution of the division of labour.

The empirical and policy issues relate the formation of knowledge-intensive regional and sectoral networks of firms to competitiveness and structural change. Data on the structure of production will be combined with indicators of knowledge and learning. IO-matrixes which include flows of knowledge and new technologies will be developed and supplemented by data from case-studies and questionnaires.

Theme C: The learning economy and the competitiveness of systems of innovation.

The third theme aims at a stronger conceptual and theoretical base for new concepts such as 'systems of innovation' and 'the learning economy' and to link these concepts to the ecological dimension. The focus is on the interaction between institutional and technical change in a specified geographical space. An attempt will be made to synthesise theories of economic development emphasising the role of science based-sectors with those emphasising learning-by-producing and the growing knowledge-intensity of all economic activities.

The main empirical and policy issues are related to changes in the local dimensions of innovation and learning. What remains of the relative autonomy of national systems of innovation? Is there a tendency towards convergence or divergence in the specialisation in trade, production, innovation and in the knowledge base itself when we compare regions and nations?

The Ph.D.-programme

There are at present more than 10 Ph.D.-students working in close connection to the DRUID research programme. DRUID organises regularly specific Ph.D-activities such as workshops, seminars and courses, often in a co-operation with other Danish or international institutes. Also important is the role of DRUID as an environment which stimulates the Ph.D.-students to become creative and effective. This involves several elements:

- access to the international network in the form of visiting fellows and visits at the sister institutions
- participation in research projects
- access to supervision of theses
- access to databases

Each year DRUID welcomes a limited number of foreign Ph.D.-students who wants to work on subjects and project close to the core of the DRUID-research programme.

External projects

DRUID-members are involved in projects with external support. One major project which covers several of the elements of the research programme is DISKO; a comparative analysis of the Danish Innovation System; and there are several projects involving international co-operation within EU's 4th Framework Programme. DRUID is open to host other projects as far as they fall within its research profile. Special attention is given to the communication of research results from such projects to a wide set of social actors and policy makers.

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