

# The Knowledge-Based Approach: An Organizational Economics Perspective

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## **Abstract**

Proponents of the emerging knowledge-based (resource-based, competence-based, etc.) theory of the firm have subjected more traditional economics of organization theories to strong critiques. Rather than directly answering this critique, we examine key ideas of the knowledge-based approach, and argue that these are not necessarily in conflict with basic ideas from organizational economics (particularly ideas relating to the property rights approach), but are either complementary to or consistent with these. In fact, property rights economics and other organizational economics ideas may at least to some extent constitute a much needed micro-foundation for the knowledge-based perspective. The purpose of this exercise is 1) to facilitate dialogue, 2) to dispel false claims of insurmountable differences between the two approaches, and 3) to establish what is genuinely different in the knowledge-based approach.

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# I. Introduction: the New Knowledge-based Critique of the Economics of Organization

It is hard to dispute the claim that the modern economics of organization has had a tremendous impact on business administration broadly conceived.<sup>1</sup> We here take the modern economics of organization to be the body of theories that seeks to address and answer the questions of 1) why firms exist, 2) what determines their boundaries relative to the market, and 3) what determines their internal organization in terms of a comparative contracting perspective. Among the theories that constitute the modern economics of organization are the transaction cost (Coase 1937; Williamson 1985, 1996), the agency (Holmström 1982; Holmström and Milgrom 1991), the measurement cost (Barzel 1989), and the incomplete contracts (Hart 1995) perspectives.

Since its take-off period at the beginning of the nineteen-seventies (Williamson 1971; Alchian and Demsetz 1972), the modern economics of organization has never been without vocal critics. However, in these two decades, the critical audience has changed. Whereas Marxists (Marglin 1974) and organization theorists (Perrow 1986; Donaldsson 1990) were the foremost critics of the modern economics of organization in the nineteen-seventies and 'eighties, the strongest opposition today arguably comes from a group of economists and strategy theorists writing under the label of "the knowledge-based" ("competence-based", "capabilities", "core competence", "resource-based") approach.<sup>2</sup> Many of the critics are quite influential and prominent economists and strategy scholars.<sup>3</sup>

Not only are the critical groups different; the issues they focus on are also different: whereas Marxists criticized the efficiency perspective and organization theorists the presumed individualist excesses of the economics of organization, the knowledge-based critics direct their critique at the presumed neglect of productive activities and productive knowledge in the economics of organization. The following quotations are representative:

Our view differs radically from that of the firm as a bundle of contracts that serves to allocate efficiently property rights ... Rather, we suggest that organizations are social communities in which individual and social expertise is transformed into economically useful products and services ...

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<sup>1</sup> To give some impressionistic evidence: according to citation data collected by our colleague, Volker Mahnke, Oliver Williamson, arguably the flagbearer of the modern economics of organization, is the most quoted author for the year of 1996 in such top journals as *Academy of Management Review* and *Strategic Management Journal*.

<sup>2</sup> In this paper, we treat, in a possibly slightly misrepresenting way, the resource-based, capabilities, etc. perspectives under the same label and as constituting a homogenous group, although they are in reality somewhat different variations on the same underlying themes. This is, among other things, motivated by the risk of drowning in a particularly dangerous terminological soup. Some of the differences in the literature are discussed in the introductory and concluding chapters to Foss (1997).

<sup>3</sup> Examples are Winter (1988), Conner (1991), Chandler (1992), Kogut and Zander (1992, 1993, 1996), Langlois (1992), Dosi and Marengo (1994), Loasby (1995), Ghoshal, Moran and Almeida-Costa (1995), Ghoshal and Moran (1996), Grant (1996), Grant and Baden-Fuller (1996), Madhok (1996), Hodgson (1997), and Teece, Pisano and Shuen (1997), Frey and Osterloh (1997).

Firms exist because they provide a social community of voluntaristic action structured by organizing principles that are not reducible to individuals (Kogut and Zander 1992: 384).

[Transaction cost economics] is fundamentally incapable of being a complete theory of economic organization. The notion of the firm as a bundle of transactions or contracts is an inadequate and shallow basis for a theory of the firm since it basically ignores the essential notion of the firm as a bundle of knowledge, and the underlying processes therein (Madhok 1996: 578).

... production requires the coordinated efforts of individual specialists who possess many different types of knowledge. Yet markets are unable to undertake this coordinating role because of their failure in the face of (a) the immobility of tacit knowledge and (b) the risk of expropriation of explicit knowledge by the potential buyer. Hence, firms exist as institutions for producing goods and services because they can create conditions under which multiple individuals can integrate their specialist knowledge (Grant 1996: 112).

Thus, the critics assert that the modern economics of organization fundamentally misrepresent the nature of firms, since firms are not best thought of as contractual entities that exist in order to align incentive-conflict, but should be thought of as knowledge-developing and utilizing entities. Relatedly, the modern economics of organization is alleged to not identify the true, knowledge-based determinants of the existence, boundaries and internal organization of firms. This means that it may produce wrong, and even dangerous, advice in connection with strategic decisions or internal organization (Ghoshal and Moran 1996). Therefore, the modern economics of organization should give way to an alternative, and superior, theory of economic organization based on notions relating to the utilization and accumulation of knowledge, rather than on notions relating to incentive-alignment or ex post governance.<sup>4 5</sup>

In order to examine these we shall try to perform what may be called a “theoretical translation”: We seek to translate as far as possible what we reconstruct as the main propositions of the knowledge-based perspective to insights normally associated with organizational economics.<sup>6</sup> In particular we rely on ideas from property rights theory (Section III, “*The Property Rights Approach*”). We focus on this

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<sup>4</sup> It should be noted that whereas some of the new critics of the economics of organization are strongly critical of organizational economics and see their own work as rivalrous to this body of thought (e.g., Kogut and Zander 1992; Madhok 1996), others are more pragmatic, seeing instead their work as complementary to organizational economics (Conner and Prahalad 1996; Teece, Pisano and Shuen 1997; Foss and Langlois 1997). The perhaps first explicit statement of this can be found in David Teece’s influential work (e.g., Teece 1982).

<sup>5</sup> An earlier discussion of the issues is the exchange between Foss (1996a,b), Conner and Prahalad (1996) and Kogut and Zander (1996). The present paper strongly extends Foss’ (rather briefly stated) position in that debate, for example, by also discussing competitive advantage.

<sup>6</sup> For a seminal discussion of some of the philosophical issues involved here, see Krajewski (1977). And for an attempt that is related to this paper, to compare alternative theories of the firm, using Krajewski’s framework, see (Foss 1998a).

approach, first, because a choice among approaches is necessary given the relative diversity that exists in modern organization economics, and, second, because this approach is very flexible and perhaps the most explicitly micro-analytic of the various organizational economics approaches.

Using property rights economics allows us to identify the zone of overlap between the two approaches: Although knowledge-based theories are formulated in a different theoretical language, nevertheless much of this language can be given an interpretation in terms of organizational economics.<sup>7</sup> This holds for the knowledge-based analysis of the three key questions identified above. Moreover, much of the knowledge-based analysis as it applies to the analysis of (sustained) *competitive advantage* can be rephrased in terms of organizational economics. The positive side of this exercise is that we argue, in effect, that ideas from the property rights approach may be seen as a partial micro-foundation for the knowledge-based approach (section IV, “*Restating and Reinterpreting Knowledge-Based Propositions*”).<sup>8</sup>

The purpose of the exercise is *not* necessarily to vindicate the modern economics of organization as against its knowledge-based critics. Actually, we think that there is much that is sound in the knowledge-based perspective and that it contains ideas and insights that are currently not appreciated in the modern economics of organization. In this respect, we focus on learning, cognition, and path-dependence (section V, “*Challenges to the Economics of Organization?*”). To sum up, the overall purposes of this exercise are

- to *facilitate dialogue* between proponents of the approaches,
- to *dispel false claims* of insurmountable differences between them, and
- to *help establish what is genuinely different* in the knowledge-based approach.

## **II. The Knowledge-Based Perspective: Main Propositions**

### *A. Resource heterogeneity and Competitive Advantage*

The knowledge-based perspective very much reflects a number of diverse influences. A brief conspectus of the sources of this emerging perspective must include, first of all, the business policy field, where issues relating to the optimal use of competencies and

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<sup>7</sup> It may be argued that there are deep-seated epistemological and ontological differences between the knowledge-based approach and the economics of organization (Hodgson 1997; Foss 1998a), and that for this reason, the two approaches are incommensurable, or at least very hard to align. However, this is not how their proponents have treated them, and rather than adopting meta-standards, we rely on how the parties perceive of their respective positions and differences.

<sup>8</sup> The paper may therefore also be seen as a partial response to Oliver Williamson’s (1996: 357-8) observation that “Core competence, which is an elusive but important concept in the recent corporate capabilities literature ... should be conceptualized more rigorously”.

the development of new competencies have been central at least for the past four decades. A standard reference here is the late Edith Penrose's *The Theory of the Growth of the Firm* (1959). Although the main concern of Penrose was to discuss the limits to firm growth, her insights have been further developed and used by the proponents of the resource-based theory to develop a theory of the competitive advantages of firms. "The firm," explains this matriarch of the knowledge-based perspective, is "a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision" (Penrose 1959: 24).

Now, resources, or, factors of production, yield services, and "... it is largely in this distinction that we find the source of the uniqueness of each individual firm" (idem.: 25). Because resources can be used in different ways, combinations and contexts, the same resources may yield completely different services. According to Penrose it is differences in the quality of the productive services available to firm from management with experience within the firm which explain *why* firms in fact utilize resources in different ways (and with different efficiencies). By accentuating the many different services available from resources and the importance of management experience at least she points to a basic and plausible story about firm heterogeneity. Therefore, her work is conventionally seen as the foremost precursor of present-day knowledge-based work. Penrose's point was that it is only through conceptualizing the firm as a bundle of heterogeneous resources, as well as services derived from these resources, that are organized under an administrative framework that an understanding of endogenous firm growth is possible. Later knowledge-based work has adopted and extended this basic assertion, so that understanding the sources of competitive advantage and aspects of economic organization are now also seen as requiring a knowledge-based conceptualization of the firm. Thus, from Penrose and later knowledge-based work we get our first knowledge-based proposition<sup>9</sup>:

**Proposition 1:** *The nature of the firm lies in its being a collection of heterogeneous resources, as well as services derived from these resources, that are organized under an administrative framework. This conceptualization is necessary and sufficient for an adequate understanding of a number of real-world phenomena, such as firm-growth, the sources of competitive advantage and economic organization.*

Moreover, because resources and services 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.<sup>10</sup> The point that specialized resources/services yield rents (though an old idea in economics) has provided inspiration for the later knowledge-based (or resource-based) analysis of competitive advantage in contemporary firm-strategy research (Lippman and Rumelt 1982; Wernerfelt 1984; Barney 1986, 1991; Dierickx and Cool 1989; Peteraf 1993). The primary contribution of this work consists of an analysis of the conditions

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<sup>9</sup> A note on terminology: By the word "proposition" we refer to more than formal statements of truth that can be formally proved as in a mathematical proof or falsified and include also definitions and statements of research heuristics.

<sup>10</sup> 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.

under which resources yield rents. The analysis is now so well-known that we simply state it as a proposition, without going into the details of the analysis:

**Proposition 2:** *Only heterogeneous, rare 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) can be rent-yielding strategic assets to firms.*

### *B. Firms as Knowledge-Embodying Entities*

Conventionally, “resources” are thought of as literally any asset that may be a strength to a firm (Wernerfelt 1984; Barney 1991). However, a number of contributors have suggested that resources be thought of as hierarchically arranged. For example, services of inputs that can be purchased on factor markets are implemented through firm-specific (and non-tradable) routines – an idea going back to Cyert and March (1963), and utilized in the context of evolutionary economics by Nelson and Winter (1962). Because routinization of tasks is a firm (or business unit- or division- or function-) specific rather agent-specific property, one may argue that “Routines are the skills of an organization” (Nelson and Winter 1982: 84). They are an important aspect of what allows “multiple individuals [to] integrate their specialist knowledge” (Grant 1996: 112), and they give the firm its distinctive function as “an integrator of knowledge” (Grant and Baden-Fuller 1996: 18). Drawing again on an extensive literature, much of it in evolutionary economics, (such as Dosi and Marengo 1994; Cohen et al. 1996), we may put forward a third knowledge-based proposition:

**Proposition 3:** *A routine is “the skill of an organization” because it embodies the knowledge needed for repeatedly implementing the (specialized) services of resources in some specific context that has been learned in response to competitive pressures and based on imitation and trial-and-error learning. It may be difficult to augment and/or transfer routines. However, effective repeated deployment of services in production requires routinization.*

A number of writers (Nelson and Winter 1982; Cohen et al. 1996) stress the automatic, even “programmed”, character of routines, and note that because of these features, routines will not only integrate individual stocks of tacit knowledge, but may themselves be partially tacit; “they just work”, for example, in response to external stimuli (e.g., a new truck arrives at the loading dock, a customer makes an inquiry, etc.). However, this also means that routines are, as it were, inherently conservative. Activating several routines in concert, for example, so that a new productive task can be carried out, or undertaking an organizational restructuring, or trying to duplicate or modify an existing routine, etc. are not activities that are fully routinized, although they may be partly so. Rather, these tasks are less programmed and are carried out by management, for example, in response to changes in the external environment. The capacity to do this effectively represents the firm’s capability, the possession of which is often seen as necessary for sustained competitive advantage in dynamic environments. This leads us to our fourth proposition:

**Proposition 4:** *Capabilities (competencies, dynamic capabilities, higher-order organizing principles.....) are meta-routines; they represent firms’ capacities to sustain a coordinated deployment of routines and services in ways that help a firm*

*achieve its goals. In dynamic environments, capabilities are necessary for effective coordination and, hence, sustained competitive advantage.*

Now, capabilities, routines and services are all knowledge-bearing assets. As a result, they will change over time, since we cannot imagine time elapsing without knowledge changing (Lachmann 1986). For example, capabilities and routines change as they are applied to new problems, as new personnel come into the firm, etc.; however, the development of knowledge is steered by strong inertial forces that narrowly circumscribe learning domains (Dosi, Winter and Teece 1992).

**Proposition 5:** *Capabilities and routines change over time, as learning may take place on several levels of the firm. However, because of lock-in to specific learning domains, capabilities, routines and services are path-dependent.*

Path-dependencies and tacit knowledge are important aspects of the application of the knowledge-based perspective to issues relating to economic organization. Thus, Nelson and Winter (1982:) note that

... a firm with an established routine possesses resources on which it can draw very helpfully in the difficult task to apply that routine on a larger scale ... [This] replication assumption ... is intended primarily to reflect the advantages that favor the going concern attempting to do more of the same, as contrasted with the difficulties that it would encounter in doing something else or that others would encounter in trying to copy its success.

The foundation of the “replication assumption” is precisely that, as Penrose (1959) emphasized and as Nelson and Winter echo, the creation of a productive organization is “... *not* a matter of implementing fully explicit blueprints by purchasing homogenous inputs on anonymous markets” (Nelson and Winter 1982). Rather, those assets that makes the firm a historical and distinctive entity are accumulated internally (Dierickx and Cool 1989). At the same time, these are (typically, if not by strict necessity) the assets that give a firm sustained competitive advantage. Among other things, this is because there is no competitive market trading process in which the value of these assets may be fully reflected in supply prices – they are “non-contestable” (Langlois 1998).

These ideas constitute the embryo of a knowledge-based theory of economic organization. As we have noted, for knowledge-based theorists, idiosyncratic and non-contestable firm knowledge is an important determinant of the size (cf. the replication assumption) and the scope of the firm. This holds quite independently of considerations of opportunism, moral hazard and the like (Kogut and Zander 1992; Madhok 1996).

### *C. Knowledge and Economic Organization*

In the arguably first knowledge-based contribution to economic organization, G.B. Richardson (1972) sketched a capabilities theory of the boundaries of the firm. In his terminology, production can be broken down into various stages or *activities*. Some activities are *similar*, in the sense that they draw on the same general capabilities. Activities can also be *complementary* 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, while access to the services of closely complementary but dissimilar activities is best obtained through an inter-firm cooperative arrangement.

**Proposition 6:** *The boundaries of the firm are determined by knowledge-based considerations. Specifically, knowledge assets that are non-contestable and idiosyncratic are governed inside the boundaries of the firm, while firms generally avoid integrating knowledge assets that are strongly dissimilar from the ones they already control. This holds quite independently of considerations of incentive conflicts stemming from opportunism, etc.*

Not only the issue of the boundaries of the firm, but also the issue of the existence of the firm can be addressed in terms of knowledge-based reasoning rather than in terms of incentive conflicts. Thus, according to Kogut and Zander (1992), firms can - because of their function as moral communities and bodies of “higher-order organizing principles” - cultivate learning processes and achieve coordination that are inaccessible under market relations. Grant (1996) and Grant and Baden-Fuller (1996) provide a related argument, since they claim that firms can develop and utilize tacit knowledge more efficiently than markets are capable of. And Conner and Prahalad (1996) construct a stylized setting, in which they demonstrate that what they call the “knowledge-substitution” and “flexibility” effects may take place more efficiently under hierarchy than under market.<sup>11</sup> These different ideas may be summarized thus:

**Proposition 7:** *Firms exist because they more efficiently than markets produce, store and utilize knowledge, particularly tacit knowledge. Rational agents will choose firm organization in the expectation of knowledge-based benefits.*

Finally, and as already indicated, the knowledge-based view has implications for understanding internal organization that are completely different from organizational economics. In a number of papers, Ghoshal and Moran (1996; Ghoshal, Moran and Almeida-Costa 1995) argue that transaction cost economics is “bad for practice”, essentially because it operates with an overly cynical view of human nature, and that following the prescriptions flowing from this body of theory will lead to perverse psychological responses, as agents adapt their behavior to essentially what is expected of them. From this perspective,

Rational control and blunt incentives – the two handmaidens of hierarchy – impede the development and utilization of local knowledge for local initiatives, whereas the sharp incentives of markets limit the lateral sharing of knowledge (Ghoshal, Moran and Almeida-Costa 1995: 752).

Indeed, empirical evidence from big companies (the authors mention Asea-Brown-Boveri), purportedly suggest that these companies do not fundamentally use “rational control and blunt incentives” in the workings of their internal organization (Ghoshal

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<sup>11</sup> While the former effect relates to hierarchical direction, where, in a sense, the knowledge of the hierarchical superior at least partly “substitutes” for that of the inferior, the latter effect refers to the ease with which the parties’ obligations and duties are changed during a contractual relationship. Both of these have been treated earlier, namely by Demsetz (1988) (the knowledge-substitution effect) and by Coase (1937) and Williamson (1985) (the flexibility effect).

and Moran 1996; Ghoshal, Moran and Almeida-Costa 1995). Rather, they try hard to construct a “shared context”, that is, an internal institutional context that not only act as a coordinating device, but more fundamentally influence the values and ambitions of employees.

Firms that aim at combining low-powered incentives with such a shared context have a competitive advantage relative to firms that rely on more blunt incentive mechanisms and on monitoring employees. To add an evolutionary dimension to this, the former category of firms will prosper relative to the latter category. As a result, the organizational economics approach to internal organization will be increasingly lacking in terms of descriptive and predictive accuracy. Thus, we obtain our final knowledge-based proposition:

**Proposition 8.** *Firms’ internal organization is best understood as a matter of creating a shared context that can help integrating and utilizing local knowledge.*

The ideas that we have tried to summarize in the preceding eight propositions are, we are told by proponents of the knowledge-based approach, either in conflict with the economics of organization or simply outside the domain of this body of theory. Because the economics of organization does not conceptualize economic organization in knowledge-based terms, it cannot come to grips with either the analysis of competitive advantage or the knowledge-based determinants of economic organization (e.g., Madhok 1996). This is essentially the claim that will be examined in the following sections.

### **III. The Property Rights Approach**

The modern organizational economics literature has not been developed in an intellectual vacuum and is admittedly somewhat diverse. Thus, one may make an overall distinction between models founded on the notion of incomplete contracts (but possibly symmetric information) and models founded on the notion of complete contracts th(but asymmetric information). Or, one may categorize different approaches according to what kinds of transaction costs are highlighted. Specifically, we shall attempt to restate and reinterpret the knowledge-based propositions in terms of what we believe to be standard ideas developed in the context of *the property rights approach*.<sup>12</sup> We take this framework to be, in a number of ways, an extension of standard microeconomics (Coase 1960; Demsetz 1964; Eggertson 1990; Furubotn and Richter 1998). The reasons why we rely on what may at first glance seem to be just another approach among a number of organizational economics approaches are that

- the framework is not committed to any specific levels of analysis; hence, is very flexible. In contrast, for example, Williamson’s (1985, 1996) transaction cost

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<sup>12</sup> Hart (1995) develops a distinct property rights approach to the firm. However, the property rights that we rely on here is broader than Hart’s, and arguably incorporates Hart’s approach. See Brynjolfsson (1994) for insights into the organization of information assets from this perspective. Putterman (1995) also contains much material of relevance to the issues under consideration here.

approach seems to be committed to analysis on the level of alternative governance mechanisms.

- Most other organizational economics approaches can be subsumed under the property rights approach.<sup>13</sup> Milgrom and Roberts (1990) offer an important contribution that develops the notion of influence activities and costs, and they argue that influence activities, transaction costs economics, the incomplete contracting approach and principal agent models are all sub-elements of a more general bargaining perspective of the firm. However, as we see it, the property rights framework is the overarching one, also encompassing the bargaining approach.

In order to ease the discussion, we here present the rudiments of this approach.

Property rights are the rights people hold over assets and these rights define the relationship among individuals with respect to scarce assets. The system of property rights is a social institution (including the law, norms and mores of society) which defines or delimits the range of privileges granted to individuals to assets, such as physical or human assets. Contracts, whether formal or informal, are used to transfer or to delineate or augment rights over assets. Private property rights over assets (whether they are illegal or legal in the sense that they are acquired in accordance with the law) include the following kinds of rights:

1. *user rights*, which define the potential uses of an asset;
2. *income rights*, or the right to consume an asset;
3. *rights to exclude* non-owners from access to assets (Libecap 1989; Eggertson 1990, and
4. *rights to transfer* permanently to another party all the above mentioned rights over an asset – that is to alienate or sell an assets (Alchian 1965; Eggertson 1990).

Often physical and human assets have different properties and may sometimes yield a number of different services depending on how the assets are used. In principle, each one of the properties and different uses of assets can be specified and be subject to negotiations between parties to a transaction. Moreover, user rights over different properties or uses of assets may be shared between individuals (Barzel 1989). For example, a copying machine can be used in different time periods and for many different types of copy works.

Another important distinction is the one between *specific* and *residual* rights (Barzel 1989; Hart 1995). Specific rights are those rights which are specified in contracts and allocated between the transacting parties before any transaction takes place. Residual rights are those rights that are not stipulated in contracts or regulated by laws and which cannot be enforced *ex post*.<sup>14</sup> Likewise, income rights can be either

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<sup>13</sup> Essentially this is because alternative organizational economics approaches look at different costs of specifying, exchanging and enforcing rights; the property rights approach incorporates them all.

<sup>14</sup> For example, specific user rights over a computer may be the rights to use it to run a particular program in a particular manner in a particular time period for some specific purpose, while the residual user rights are the rights to use the computer in all other not specified time periods and in all the manners possible. If the computer can be used for more than one purpose, it is a generic asset and residual rights then include the right to decide for what purpose to use the computer. In the literature

specific or residual. Residual income rights (or residual claims) are the non-specified income or pleasure a person can enjoy from using or alienating an asset (including his labor). Residual user rights are often paired with residual income rights in order to create the kind of incentives which will result in efficient outcomes.

Finally, rights to decide between some pre-specified uses of assets may be delegated to others. The person who has the rights to determine the set of possible uses as well as the right to decide on delegating decision rights has the residual rights. Legal rights to specify specific rights over physical assets, delegate and otherwise transfer rights over assets follow from legal ownership over assets, and in the case of labor from voluntary agreements to transfer these rights.

In the property rights framework, transaction costs are conceptualized as the costs due to the "... transfer, capture and protection of rights" (Barzel 1989: 2). A particularly important category of costs is *measurement costs* (Barzel 1989). These are the costs of delineating and of metering or controlling the valued attributes of goods and resources (including human resources). Most types of transaction costs are reducible to measurement costs. For example, costs of monitoring, inspecting quality, enforcing contracts, etc. belong to this category.

High measurement costs often imply that transacting parties voluntarily leave rights over certain properties of an asset unspecified and unprotected and therefore also unpriced.<sup>15</sup> Unspecified and unpriced attributes may create costs stemming from the attempts of individuals to capture the value from those attributes. Such capture attempts may take the form of shirking, of excessive use of resources or of excessive search and sorting in order to locate unpriced attributes.<sup>16</sup> Different kinds of actions may be taken in order to reduce the resources spent by transacting parties on rent-

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the distinction between residual and specific user rights is not completely clear-cut. Sometimes only the right to decide between different kinds of uses of an asset is described as residual rights while rights to decide how to use an asset in a specific way is described as discretion (Alchian and Demsetz 1972). Moreover, legal ownership over assets are sometimes used as synonymous with residual rights over assets (Hart 1995). However, one may have legal but non-exclusive rights over assets because exclusivity is costly to enforce by means of courts or by private enforcement. Those rights which are not enforced are captured by others who then have some residual (non-specified) rights over the asset. When assets are used by others, so that the legal owner's de facto possibilities to use his asset, he has only limited residual rights.

<sup>15</sup> For example, to completely specify all rights to use a computer requires full knowledge of all possible uses and all the different ways in which the computer may be operated, as well as a detailed listing of these uses. In addition, one would need to perform a tight surveillance of the users of the computer in order to enforce one's rights. Many rights over a computer are therefore left unspecified, and these rights may be captured by the user of the computer who then is capable of exercising some discretion in his decisions on how to use or operate the computer.

<sup>16</sup> For example, the provision by shopping centers of free parking space can be explained in terms of high costs of enforcing rights over such assets (Demsetz 1964). The non-price allocation of the use of parking space then takes the form of "first come, first served" and queuing for a parking space. Resources will be spent on getting to the parking space in due time for a space and on time in queue for a space.

seeking activities<sup>17</sup>. For example, shirking may be reduced by monitoring the performance of individuals more closely, excessive use of assets can be constrained by restricting or prohibiting some uses of assets and excessive sorting can be constrained the sorting into quality classes by the seller.

We now try to apply these ideas as far as possible to the main ideas of the knowledge-based approach. Specifically, we shall use these ideas to restate and reinterpret knowledge-based propositions, in the sense that we develop what we believe are *deeper* organizational economics explanations for the knowledge-based propositions presented in section II.

## **IV. Restating and Reinterpreting Knowledge-Based Propositions**

### *A. Preliminary*

So far, there has been little dialogue between organizational economists and knowledge-based theorists of the firm.<sup>18</sup> There may be many reasons for this, one reason being that different disciplinary and institutional backgrounds (economics and universities vs business administration and business schools). Another one may be that organizational economists have not fundamentally seen the knowledge-based critique as a challenge, being able to point to an impressive empirical basis that may be taken as a vindication of, in particular, the transaction cost approach (Klein and Shelanski 1996).<sup>19</sup> However, for a number of reasons, we do believe that dialogue is necessary. First, there is the distinct possibility that knowledge-based theorists of the firm have in fact identified explanatory mechanisms and pointed to phenomena that, while crucial to economic organization, have been neglected by economists of organization. Second, there is the opposite possibility that much of what knowledge-based theorists of the firm are saying is not at all in conflict with organizational economics, but is merely expressing insights about economic organization in a different theoretical language.

Indeed, in this section, we shall argue that the latter possibility largely (if not completely) holds true, at least in the sense that it is possible to restate all of the propositions presented in the previous section in the terminology used by the organizational economist. This may be taken to imply that much knowledge-based reasoning about, notably, economic organization is not fundamentally novel, but

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<sup>17</sup> In the literature (Buchanan, Tollison and Tullock 1980), rent-seeking is defined as attempts by individuals to increase their personal wealth while at the same time making a negative contribution to the net wealth of their community.

<sup>18</sup> But for the exchange between Foss (1996a&b) and Conner and Prahalad (1996) and Kogut and Zander (1996).

<sup>19</sup> Poppo and Zenger (1995) is an empirical (quantitative) examination of transaction cost vis-a-vis knowledge-based explanations of make-or-buy decisions. Their findings support transaction cost explanations only. Argyres (1996) is a case-study approach to the same issues. It illustrates for both explanations.

merely well-known principles in a different packaging. To strengthen the argument, we also argue that the insights gained from the knowledge-based perspective on the *competitive advantage* can be interpreted by means of the economics of

One of the main ideas of the property rights perspective is that the value of assets depends on what agents are entitled to do with the assets. This is because many assets

private ownership rights over the assets. The idea that the value of assets depends on their deployment is very much in line with the main thrust of Penrose (1959), although

and property rights theorist put emphasis on the legal and social constraints on the use of assets. However, we can align the two views by saying that within the constraints

rights over assets) may choose between many different uses of assets depending on their skills, experience and knowledge of relevant contingencies.

services by deploying resources for the production of goods and services. The essential difference “... between the economic activities inside the firm and economic activities

while the latter is not” (Penrose 1959: 15). This resembles the Coasian (Coase 1937) notion of firms in which the distinguishing mark of the firm is the replacement of the

<sup>20</sup> Of course, the basic difference

that the choice between firms and markets is also a choice between different contractual arrangements, turning on their respective transaction cost properties.

along the following lines:

**Proposition 1 (reformulated):**

*formal and informal contracts delineating rights over the different attributes and services which may be obtained from the bundles of physical and human resources by means of*

*economic organization (and helpful for understanding phenomena such as sustained competitive advantage and firm growth).*

As stated earlier, the property rights perspective holds that maximum resource value obtains if user rights over assets are allocated to those who are best able to use those assets. Under full knowledge of valued uses and properties of assets, prices will perfectly reflect the marginal value of assets in their best uses. Only differences in skills or experience may explain ownership advantage over assets, and only if managers possess those skills should they hold the rights needed to take advantage of their skills. Managers with ownership advantages over rights over assets earn a

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<sup>20</sup> However, Penrose’s book was apparently written in ignorance of Coase’s 1937 paper, “The Nature of the Firm”.

Ricardian rent on their skills if these are in fixed supply and may (at least in the short run) earn a monopoly profit on their use of resources.

However, it is only if transaction costs are low that rights over assets will perfectly gravitate into the hands of those who have the most valued use of those rights. This is because in a world with high transaction costs, the price of rights over assets will reflect their value to potential users less the costs of transacting. If the costs exceed the value which may be gained from a reallocation of rights, no trade will take place and the initial assignment of property rights will strongly influence allocative efficiency. In the case of high transaction costs, persistent monopoly profits may be earned by those who have both an ownership advantage and the rights over assets needed to realize this advantage.

Now, an accidental combination of superior skills with rights over assets need not be the only source of competitive advantage in a world of positive transaction costs. As one of the key persons in the development of the property rights approach, Harold Demsetz points out, uncertainty, less-than-fully-mobile factors and private information about the cost or benefits of realizing different plans, or even about the likelihood of possible outcomes, may imply that "... a differential advantage in expanding output develops in some firms" (Demsetz 1973: 1).

In fact, above-normal return is possible even if all possess the same information about the likelihood of different outcomes so that prices of assets reflect expected value. This may be the case if the outcome of an investment turns out to be the most preferred one, so that the acquisition costs of assets are lower than the realized value. Explains Demsetz "[b]y the time their value to the firm is recognized, they are beyond acquisition of other firms at the same historic costs, and, in the interim, shareholders of the successful or lucky firm will have enjoyed higher profit rates" (Demsetz 1973: 74). Of course, with repeated investments it may not be the same firms that are the lucky ones each time, unless they possess private information about possible outcomes - a key conclusion in the knowledge-based analysis of competitive advantage (Barney 1986).

It is thus striking that many of the main ideas of the knowledge-based approach as it applies to the analysis of competitive advantage were clearly stated by Demsetz in a number of contributions reaching back to 1973 (see further Foss 1998b).<sup>21</sup> However, even in Demsetz' work, heterogeneity is asserted, rather than explained. In the next section, we try to develop an economic approach to heterogeneity and link it to the analysis of competitive advantage.

### *C. Resource Heterogeneity and Competitive Advantage*

From an economic (as distinct from a technological) perspective, we may think of input factors/resources as being of heterogeneous quality, if, when allowed, entrepreneurs/managers will spend resources on choosing among equally priced units (Barzel 1982: 343). Faced with heterogeneity, entrepreneurs will in fact spend resources on such choosing, because they wish to reap the (Ricardian) rents associated with higher quality of the attributes and services from these resources. However, as

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<sup>21</sup> Particularly to his work in industrial organization where it underlies his discussions of concentration (Demsetz 1973), entry barriers (Demsetz 1982) and oligopoly profit (Demsetz 1989).

emphasized in the knowledge-based analysis of competitive advantage, resources only from the rent-seeking literature tell us that the possibility that a firm may obtain a rent-earning asset below its value depends on how many resources competing buyers their information about the variability of the quality of assets and on their conjectures about the competition for rent-earning assets.

renders above-normal profit possible for the lucky or better informed firm, it also entails a large waste of resources on unproductive searching and screening activities.

transacting parties to more productive uses. The potential inefficiencies due to variations in quality of assets are magnified if asymmetric information is added to the

example, Akerlof (1970), Klein and Leffler (1981) and Nelson (1970) a market break-down may be the outcome. In such cases, investments in setting up different

development of protected brand name and associated brand name capital) may be efficient.

the knowledge-based perspective as sources of superior returns to firms (e.g. Dierickx and Cool 1989). However, paradoxically no fundamental reason is given in this

rights/transaction cost perspective provides an economic rationale as to why they may be valuable assets as well as an explanation of why they can be sources of superior

uniform quality of products or of abstaining from adverse selection (even if profitable in a short term perspective), it may accumulate a reputation for honesty. Such a

less resources on ascertaining the quality of the products on offer, and some of the saved resources can be captured by the firm. Due to historic differences in the

competitive advantages in markets characterized by information costs and asymmetric information.

Of course, competitive advantage is not just a matter of such market-oriented “internal” valuable resources is the seminal Alchian and Demsetz (1972) paper. Here we find a basic explanation of why in the face of measurement costs, “... gains from like the firm“ (p.75) . According to Alchian and Demsetz, under team production, efficiency considerations will dictate the appointment of a specialized monitor who

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Differences in the time horizon of firms may explain why they choose different strategies with respect to how they deal with information costs. The time horizon of a firm may depend on whether it is

internalizes the externalities which arise under team production (meaning production task where individual marginal products are very hard to ascertain). The manager serves the important function of acquiring special superior information about the diverse services which can be extracted from heterogeneous resources of variable quality. Based on this information he is also able to better determine efficient input combinations. These ideas provide a basic explanation of efficiency differences between firms as

... a result not of having *better* resources but in *knowing more accurately* the relative productive performances of those resources. Poorer resources can be paid less in accord with their inferiority; greater accuracy of knowledge of the potential and actual productive actions of inputs rather than having high productivity resources makes a firm (or an assignment of inputs) profitable (Alchian and Demsetz 1972: 94).

Thus, an important source of competitive advantage lies in what may roughly be called “organizational factors”, namely how and how well the process of sourcing and applying input factors/resources is organized (cf. also Williamson 1991).<sup>23</sup> There are at least two aspects of this, namely continuity of association among input owners and specialized monitoring and management services. Both reduce measurement costs and allow team-rents to be realized. Explain Alchian and Demsetz:

... opportunities for profitable team production by inputs already within the firm may be ascertained more economically and accurately than for resources outside the firm. Superior combinations of inputs can be more economically identified and formed from resources already used in the organization than by obtaining new resources (and knowledge of them) from the outside (Alchian and Demsetz 1972: 94).

This line of reasoning may be extended to the issue of sustainability of competitive advantage. Thus, it may be claimed that an important source of sustainability is having and maintaining a lead in terms of reducing the measurement costs of learning about specific inputs and about how the characteristics of inputs may be combined in productive processes. Since costs of detecting shirking, and also of detecting productive talents, within a given team is higher for competitors than for the monitor within the firm, competition for superior resources will be imperfect. Moreover, the successful firm can, based on its superior knowledge of the characteristics of its resources and services, reconfigure these, creating *new* imperfections in the competition for superior resources.

This reasoning adds a dimension to the knowledge-based approach that is oddly absent in its present version (Spender 1994) – namely the actual organization and application of various resources in production. This application process is made effective through contractual incentives (implicit as well as explicit) and monitoring arrangements (including bonding and the like). Efficient economic organization minimizes the costs of those contracts and monitoring arrangements (Williamson 1991). Thus, we obtain

**Proposition 2 (reformulated):** *In imperfect markets - markets with high transaction costs - superior management skills or heterogeneous resources may be sources of above-normal returns. Competitors' imitation of the sources of advantage may be difficult*

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<sup>23</sup> An empirical study by Hansen and Wernerfelt (1989) clearly supports the view of the importance of organizational factors for explaining inter-firm variances in profit rates.

*because of high costs of discovering the relevant heterogeneous characteristics of resources. The realization of the rent-earning potential of assets depends on the economic*

#### ***D. Conceptualizing Routines and Capabilities in Property Rights Terms***

According to the knowledge-based perspective, firm-specific assets, such as routines and capital). The reasons normally provided for why this should be so are that these assets are particularly prone to encapsulate knowledge that is 1) tacit, 2) firm-specific and 3) path-explicitly economic point of view?

We suggest that as a first abstract approximation - activities which are carried out as individuals exercise their user rights over assets. We may then note that in a world of zero transaction costs, all rights over assets are specific structure. In such a situation, a tacit component of “a routine” would only be present in the skills of individual agents exercising their rights; tacitness cannot be a property of the in so far as no new information leads to a disturbance of the equilibrium plans of agents.

This is admittedly an unusual way to think about routines, since routine behavior behavior and claimed to be a consequence of bounded computational capacity and uncertainty (Dosi and Marengo 1994). The stability-of-behavior element of routines can be and allocation of rights in response to contingencies - the response that would obtain in a zero transaction cost world is non-optimal.

In order to focus more clearly on knowledge which routines embody, and why routine behavior may after all be optimal (given the constraints facing decision takers), it is useful to distinguish between a 1) computational capacity of individuals. This also allows us to arrive at a more coherent (if rather different) microfoundation for routines than that found in the knowledge-based

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#### ***Coordination Problems and Conventions***

*coordination*

*problems*

to high measurement costs, not all rights over assets will be perfectly specified and individuals may have some discretion in exercising their rights. Discretion may be useful, assets (Kirsten Foss 1998). However, it may, of course, also cause problems of shirking and problems of misallocation due to lack of coordination of complementary activities carried convention may emerge as a solution to coordination problems.

Sugden (1986) provides a well-known example of how the convention that everybody drive in either the left or the right side of the road is established as a solution to a coordination game. A convention about driving on the left hand side of the road economizes on transaction costs, since it eliminates the need to negotiate a contract every time one meets a car on the road. The enforcement of a convention need not be optimal in every situation. For example, in a cross-road game it may appear to be optimal to let the driver whose time is most valuable go first. However, due to the high costs of determining whose time is most valuable, it is on average better for all parties to stick to the rules.<sup>25</sup>

In connection with productive activities, firm-specific conventions may emerge as solutions to coordination problems which resemble those of the cross-road coordination game. Individuals may have different “strategies” for executing non-specified user rights (such as driving on either the left or the right hand side of the road) and there may be gains in terms of, for example, saved effort if all choose the same strategy and losses if they choose different strategies. A stable solution emerges once a critical mass of rule-followers makes the convention self-enforcing. In property rights terminology, such a convention is a self-inflicted restriction on the exercise of decision rights where the restrictions are in accordance with the interests of the holder of the rights. It makes the behavior of each individual predictable relative to a situation without the convention and established a stable pattern of behavior (a routine).

In the knowledge-based perspective, routines are often perceived of as being firm-specific, valuable, non-tradable and with a limited range of applicability. Routines therefore set limits to the rate and the direction of profitable expansion of firms (Dosi, Winter and Teece 1992). The firm-specific element of routines can be interpreted as a consequence of different historic circumstances under which a code or a convention emerges. Such circumstances include different players, the physical layout of the firm, and the organizational structure as defined by the formal allocation of rights to decisions and returns. Moreover, the routine may be hard to imitate because shared knowledge of the specific conventions and codes of communications are necessary for routines to be effective. Each member of the organization therefore has to possess a certain “receiver competence” (Eliasson 1990) which makes it possible for her to interpret the messages he receives. Intuitively, such receiver competence may depend on the duration of the affiliation with the organization.

From an economic perspective the path-dependent and growth-constraining aspects of routines may be translated into a proposition about sunk costs of developing conventions which set efficient bonds on the exercise of non-specific rights and about how the economic benefit of effective routines embodying such solutions to coordination problems may outweigh the expected benefits of trying to re-delineate and reallocate right in response to the new types of contingencies one may face in new business areas.

### ***Implicit Contracts, Truces and Path-Dependency***

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<sup>25</sup> Of course, what convention will be established in such a symmetric coordination game as the cross-roads game is essentially arbitrary. In practice it may hinge on various “precedents”, such as culture or (other) historical circumstances, which are not normally a part of description of games in classic game theory.

Another aspect of the rigidity of routines has to do with implicit contracts, which refer to the shared expectations the parties have concerning the relationship. Such contracts are relationship many of the crucial elements is governed by implicit contracts. In an employment contract the employee agree to obey the direction of a manager “within authority over labor services. be partly determined by an implicit contract. Implicit contracts are often said to provide for flexible responses to unforeseen contingencies, but the extent of flexibility within the range of established trust (see also Kreps 1990). Actions which require may not be easy to implement; this may be yet an aspect of organizational rigidity and path dependency in firm behavior.

for example, Nelson and Winter (1982) of routines-as-truces (cf. also Cyert and March 1963). According to Nelson and Winter routines may represent a truce in the sense that individuals ”... to do ‘what is required’ by them in the routine operations of the organization as a whole “ (Nelson and Winter 1982: 107). Interestingly, they claim that a *required* for any routine

By application of the Coase theorem, the establishment of such a truce is straightforward in the case of perfectly zero transaction cost. It is a completely different guaranteed by re-contracting. Furthermore, when, as in the case of the firm, decision rights are purposively made inalienable, employees in firms have private non-transferable With the blocking of negotiations over certain rights, employees may find it advantageous to act strategically by, for example, misrepresenting the economic benefits of different actions which would be Kaldor-Hicks efficient may be non-feasible, if they are interpreted as an attempt by one coalition in the organization to capture a greater part of the surplus at

Perfect concentration of authority with a manager is one way of reducing problems of inefficiency, instability, rent-seeking behavior or indecisiveness in social choice situations costs of delineating and enforcing managerial rights. Furthermore, concentration of decision power may come at the expense of the benefit of specializing in information screening and selection procedures and means of socializing employees (Miller 1992).<sup>26</sup>

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By carefully selecting and socializing members of an organization one reduces the trade-off between delegation efficiency and transitivity in the social preference ordering, since this trade-off need not exist

becomes firm-specific and the sunk costs of establishing such procedures an indicator of path dependency in firm activities.

### ***Limited Computational Capabilities and User Rights***

The assumption of limited computational capabilities directs the focus to a number of other explanations of stable, path-dependent behavior of firms which is said to be the characteristics of routinized behavior. For example, limited computational capacity may sometimes make it more efficient to rely on rules of thumbs rather than the price mechanism as a way of allocating pre-specified rights over assets. Rosen (1991) demonstrates how in the case of joint production, pricing schemes becomes extremely complex to work out. And since errors in prices can be more costly than errors in the allocation of activities and time, it may be advantageous to rely on the judgment of managers in deciding on the allocations. Managers will, of course, also be boundedly rational and the experience and formal training of managers may then explain differences in the quality of the judgments made. Furthermore, boundedly rational managers are not likely to change the allocation of rights in response to any small perceived changes in the conditions surrounding the established procedures.

In fact, Heiner (1983) argues that limited computational capacity may imply that it is efficient to constrain the kind of decisions managers can make regarding re-delineation and re-allocations of rights. Thus, in situations where decisions takers are faced with a gap between their own computational competence and the complexity of the decision situation, "... allowing greater flexibility to react to more information or administer a more complex repertoire of actions will not necessarily enhance an agent's performance" (p.563). This is because under genuine uncertainty, there is a certain chance that one may pick the right action at the wrong time and thereby inflict higher costs on the organization than by abstaining from action. Specifically, it is efficient to limit the repertoire of actions (the exercise of user rights) to those actions which are appropriate in most situations with the modification that agents who are more able to determine the right situation from the wrong situation need less severe limits on their decision rights.<sup>27</sup> From this follows that limits on the delegation of authority to managers in organizations may be efficient and that the limits on decision rights should depend on the structure of uncertainty and on the competence of the managers in determining the "right" from the "wrong" decision situation.

Delineation of specific rights and delegation of authority within pre-specified limits may be means of restricting decisions in situations of uncertainty and bounded computational capacity. However, with high cost of specifying and enforcing contractual stipulations, it may be impossible to avoid harmful discretionary behavior of employees. Furthermore, with uncertainty and high costs of determining the competence of employees, the optimal limits to actions may have to be discovered by higher-level managers with the rights to delegate decision rights. Experience in decision making, different kinds of screening and selection procedures and incentive mechanisms which encourage the revelation of decision-making talent of lower-level managers may help

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<sup>27</sup> It may be noted that when judged by the standards which would apply in a zero information costs world of perfectly rational decision makers, the stable behavior of firms which follow from such limitation in decision rights will be non-optimal. But in a world of zero information and transaction costs the non-optimal outcome would never materialize. This is because the Coase theorem would apply and rights would be exchanged so that mutual beneficial actions would be carried out.

higher-level managers to set the right limits to the delegation of decision rights. Conventions and social constraints and other aspects of corporate culture may be equally important in limiting the set of perceived possible uses of assets by those who acquire decision rights (Miller 1992). Neither the experience of higher-level managers nor the screening devices, incentive mechanisms or social norms may be globally applicable and this may be an additional part of the explanation of path dependency in firm behavior.

To sum up this lengthy discussion: representing stable responses to contingencies, routines embody shared knowledge that help coordinating interdependent activities and ensure the fulfillment of transacting parties' expectations with respect to the activities to be carried out as well as the rewards to be obtained. Routines also encompass the skills needed by employees to do their job as well as the experience of managers needed to provide efficient directions and efficient bounds on behavior. The sunk costs of accumulating this knowledge, along with the competitive advantage afforded by such knowledge in the specific areas to which it applies, explains the path-dependent nature of firm behavior. Except for the skills of employees, none of this knowledge would be needed in a world of zero transaction costs and unboundedly rational agents. Thus we get

**Proposition 3 (reformulated):** *Routines are sequences of activities which are carried out as individuals exercise user rights over assets in a coordinated manner. Routines are the skills of a firm because they embody purposively and non-purposively designed solutions to problems of social coordination in a world characterized by interdependence in activities, high measurement costs, asymmetric information and limited computational capacity of agents. Thus, routines are often low-cost responses to coordination and incentive problems in high transaction costs environments. The firm-specific character of these solutions is a consequence of differences in the setting in which they evolve and they are therefore not generally transferable to other settings. Since routines are responses to imperfect information and limited computational capacity of individuals, it may be difficult and costly to try to augment routines in order to reach more efficient outcomes.*

In the knowledge-based literature, routines are seen as being operated by higher-level personnel for a strategic purpose. The ability to sustain a coordinated deployment of routines (and other assets) constitutes the firm's productive capability. Thus, we take capabilities to reside on the level of management. The economic reason for making a distinction between routines and capabilities is that managers hold residual rights over assets, including the rights to re-define and reallocate specific rights.

Routines and capabilities embody tacit, changing and not easily definable shared knowledge. These characteristics make it difficult to delineate and enforce exclusive decision rights over these assets.<sup>28</sup> This in turn implies that no manager has formal exclusive control over a routines or a capability. The above presentation of an economic perspective on routines may be interpreted as saying that the role of management is very limited in relation to the evolution of routines in firms. This, however, is not necessarily so.

Lack of formal control does not mean that manager are without influence over the evolution of routines and capabilities. First, codes and conventions do not emerge in a

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<sup>28</sup> That is, they are non-verifiable and thus non-contractible.

vacuum. Managers holding residual rights over human and physical assets may create environments which are more or less conducive to the evolution of cooperative solutions. Secondly, managers may voluntarily restrain their exercise of rights in order to “convince” employees to truthfully reveal private information and cooperate rather than act on the basis of short term self-interest. By creating a culture of cooperation and credibility managers may limit the costs of strategic misrepresentation of information, adverse selection and moral hazard as well as reduce costs due to “tribal warfare” among coalitions. The ability of a manager to create shared expectations of cooperative behavior among team members or between employees and superiors may in turn strongly depend on the history of the firm with respect to honoring cooperative behavior (Kreps 1990; Miller 1992). Therein lies some of the “firm”-specific element of a capability.

Furthermore, differences between firms with respect to their “social contract” (that is the shared knowledge and expectations which provide the foundation for coordinated and cooperative behavior in situation of incomplete information) may provide managers with a greater space of actions for re-delineating and allocating rights<sup>29</sup> in response to the contingencies and profit opportunities they perceive of. In dynamic environments, such a “buffer zone” may be necessary in order to achieve efficient coordination at low costs.

**Proposition 4 (reformulated):** *Capabilities embody the skills of managers as well as historically evolved “social contracts” among employees and between management and employees. Such social contract may ensure a higher level of performance as well as a greater space of action for managers to reallocate decision and income rights in ways which help the firm achieve its goals.*

**Proposition 5 (reformulated):** *Capabilities and routines change over time as learning take place on several levels of the firm. Accumulation of skills and the evolution of norms, values, shared exceptions, and conventions are strongly influenced by the allocation of user rights in a firm and how broadly these rights are defined. The history of interaction among members of the firm, the time horizon of the firm and the “social contract” of prior developed solutions to coordination and incentive problems constrains the re-delineation and allocation of rights and thus evolution of new knowledge. Thus, path-dependence results.*

### *E. Transaction costs, Knowledge and Economic Organization*

A key knowledge-based proposition is that the boundaries of firms are determined by knowledge considerations, and that, because of the non-tradable character of the knowledge embodied in routines and capabilities, changes in boundaries are circumscribed by the historic patterns of accumulation inside firms of these assets (Dosi, Winter and Teece 1992; Kogut and Zander 1993).

Insights from organizational economics are not necessarily in contrast to this, however, but is rather complementary. Thus, organizational economics provides a more thorough understanding of the conditions under which the behavioral constraints of shared values, norms, convention etc. are important and efficiency-enhancing aspects of property rights systems. And from this we are able to explain the value to firms of norms, conventions and other bounds on behavior enforced by social pressures as responses to considerations of both coordination (production) problems and incentive problems arising from the possibilities of opportunism, moral hazard and adverse selection – aspects that we have argued are important to the understanding of routines and capabilities.<sup>31</sup>

However, the knowledge-based perspective is normally presented by its proponents as emphasizing production and qualitative coordination aspects of firms, rather than the exchange and incentive aspects of firms that are highlighted in the modern economics of organization. A primary source for developing this argument is Demsetz’ much cited 1988 paper.<sup>32</sup> What knowledge-based theorists use from his paper are the overall ideas that it may pay to have those with less information being directed by those with more, so that hierarchical governance is rationalized in terms of the coordination of knowledge, and that the boundaries of the firm may reflect economizing with expenditures on knowledge transmission, so that a firm’s boundaries is determined by equalizing the benefits from producing a product or service with the costs of obtaining (and storing, maintaining, etc.) the required productive knowledge. Admittedly, these ideas lie outside the mainstream of

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<sup>31</sup> It should be noted that neither the property rights nor the knowledge-based perspective provide any explanation of why firm organization should be particularly conducive to the evolution of efficient bounds on behavior in situations characterized by high measurement costs and asymmetric information about outcomes and preferences. In contrast to the knowledge-based approach, the property rights perspective does, however, provide a framework in which it is possible to inquire into how exactly formal ownership and residual rights to control influence the evolution of informal constraints on behavior.

<sup>32</sup> Whereas much of the knowledge-based analysis of competitive advantage has not gone significantly beyond Demsetz (1973), one may argue that much of the knowledge-based analysis of economic organization has not gone beyond Demsetz (1988). Thus, Grant (1996) relies strongly on Demsetz (1988), and Conner and Prahalad (1996) also draw on this paper.

economic organization, although they do lend themselves to an interpretation in terms of property rights, for example, along the following lines.

If all productive knowledge were in the form of blueprints, there would be relatively little need to focus on production aspects of firms. We may thus ask: What are the non-blueprint aspect of production knowledge? And why are these aspects of production knowledge more effectively transmitted within the hierarchy rather than across markets by means of spot or order contracts?

From a property rights perspective, we may associate non-blueprint knowledge with imperfectly specified rights to valuable attributes of assets, for example, human capital. Thus, tacitness makes it very costly to contract over certain attributes, and we may then seek an understanding of why, under the circumstances of high information and transaction costs, the coordination mechanisms characterizing firms are more efficient than markets. In a dynamic perspective in which we allow for uncertainty and bounded rationality, not all valuable attributes of assets are discovered or, if they are discovered, their value may remain unknown. In such a setting, one may argue that firms are often more efficient institution for promoting the discovery, delineation and allocation of rights over previously undiscovered valuable attributes of productive assets, for example, because managerial discretion (rather than market contracting) may confer advantages in terms of experimenting with production processes. The procedures by which experiments are conducted, as well as the experience gained from experiments, may be included as part of the productive knowledge of firms.

The boundaries of a firm will be determined partly by the efficiency of firms relative to markets in providing solutions to incentive as well as coordination problems, partly by differences in comparative advantages of firms in organizing different activities. The latter may depend on the types of skills and knowledge of the employees, on the scope of applicability of informal solutions to incentive and coordination problems, and on the experience accumulated from experimenting.

**Proposition 6 (reformulated):** *The boundaries of firms are determined by efficiency considerations. The efficient boundaries of firms depend on the relative costs of organizing productive activities in one firm instead of organizing it another firm supplemented by market transactions. The boundaries of a firm relative to another depend on their respective comparative advantage in coordinating activities based on their ability to accumulate and transmit non-blueprint production knowledge **as well as** on their ability to develop efficient solutions to incentive problems.*

With respect to the issue of *the existence* of the firm, knowledge-based theorists generally assert that firms exist because they more efficiently than markets produce and utilize knowledge, particularly tacit knowledge, *not* because they provide efficient responses to incentive conflicts (e.g., Grant 1996). Now, it has been a standard argument in favor of *markets* that they efficiently produce and utilize knowledge, including tacit knowledge (Hayek 1945). So we need discriminating principles that allow us to tell when markets will do the job and when firms will: why can't input owners who repeatedly transact over the market realize the same knowledge-based advantages as agents that cooperate under the umbrella of firm organization (Foss 1996a&b)? Stated differently, what exactly is the nature of the link between the (team-

specific) knowledge embodied in capabilities, routines, etc. and economic organization?

Unfortunately, only very few knowledge-based contributions try to supply the relevant discriminating principles and links,<sup>33</sup> or are even aware that there is a problem. However, in the light of conventional organizational economics, the link goes *via* the transaction costs involved in the coordination of productive activities. The supersession of the price mechanism in favor of managerial order-giving was stressed by Coase (1937) as the distinguishing mark of the firms and explained by the high transaction costs which is sometimes involved in discovering the relevant prices needed to coordinate activities. Later contributions to the theory of the firm have focused on how firms may reduce monitoring costs and thereby better ensure team-rents that the continuity of association among input owners may create and the attendant rent-seeking activities of input owners (Putterman 1995; Foss 1996a&b). Realizing efficiency requires that those who are best able to influence the size of team-rents should become managers/owners (Barzel 1989).

From the knowledge-based perspective, such explanations of the existence of firms are at most limited stories, since they do not take into account the important aspects of firms as cultural entities and as entities embodying highly specific and tacit knowledge which enable cooperation and coordination (e.g., Madhok 1996; Kogut and Zander 1996). However, it is not clear that the characteristics of 1) being a cultural entity and 2) a storehouse of productive knowledge are really convincing arguments for the existence of the firm. First, these characteristics are not unique to firm organization; industrial districts, firm networks and other extended forms of governance may also possess them. Second, even if it be granted that firms embody, for example, types of cultures which are different from those of other communities or organizations, it is not necessarily a reason for the existence of firms *unless* it can be convincingly argued that cooperation within firms promotes the development of more efficient cultural constraints on behavior than market cooperation. This argument has not, it seems to us, been made by proponents of the knowledge-based perspective. To be fair, it should be noted that in general little is known about how ownership and allocations of rights influence the evolution of norms, values etc. What we do know from an enormous body of organizational economics literature, however, is the following:

**Proposition 7 (reformulated):** *Firms exist because transaction costs makes it more efficient to organize some types of transactions within firms. Firms are responses to market failure due to, for example, problems of common ownership of productive assets, team production problems, problems of adapting and enforcing incomplete contracts in situations of asset specificity. Rational agents will choose firm organization, for example, because they wish to safeguard the benefits from specific knowledge assets.*

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<sup>33</sup> In fact, only Demsetz (1988) and Conner and Prahalad (1996) come to mind as serious attempts. Demsetz essentially explains firm organization by specialization in direction: "Firms and industries must form a pattern of economic organization that takes account of the need for acquiring knowledge in a more specialized fashion than the manner in which it will be used. Those who are to produce on the basis of this knowledge, but are not possessed of it themselves, must have their activities *directed* by those who possess (more of) the knowledge. Direction substitutes for education (that is, for the transfer of the knowledge itself)" (1988: 159). Conner and Prahalad largely refines this view.

Knowledge considerations may be important partial explanations of the existence of the firm, but only, we would conjecture, to the extent that they are connected to problems of common ownership, team production, etc. (Putterman 1995; Foss 1996a&b).

According to knowledge-based theorists, *internal organization* is better understood in terms of the creation of a shared context and an avoidance of “blunt incentives” (e.g., Ghoshal, Moran and Almeida-Costa 1995). But this is not in contradiction to organizational economics. It will be generally agreed that a shared context stimulates what Malmgren (1961) called “convergent expectations”, in other words, solves coordination problems. It makes the firm’s employees have the same perception of reality, and it eases monitoring (Alchian and Demsetz 1972). In general, therefore, intra-firm labor allocation may realize an advantage with respect to rating information that is costly to communicate across markets (Williamson, Wachter and Harris 1975).

With respect to the issue of avoiding “blunt incentives”, this has been treated in recent work (e.g., Holmström and Milgrom 1991; Barzel 1989) as a matter of explaining why internal organization is normally characterized by “low-powered” incentives. The explanation is that some vital activities are very costly to measure and that tying incentive schemes to measurable activities produces an bias away from vital, but hard-to-measure activities – an explanation that would seem to have particular force in connection with “knowledge-related activities”.

**Proposition 8 (reformulated):** *The internal organization of firms is often characterized by a shared context and low-powered incentives, because this increases the convergence of expectations and plans, and the existence of (essential) activities that are hard to measure makes low-powered incentives more efficient.*

### *F. Summing Up*

To sum up our critical analysis of the knowledge-based approach, our overall charge has been that much of this approach is characterized by a somewhat superficial style of analysis. It is “superficial” in the precise sense of the word that deeper explanatory mechanisms are not really inquired into. For example, the claim that firms exist because they supply “higher-order organizing principles” (Kogut and Zander 1992) is superficial in this sense, because 1) it doesn’t acknowledge that “markets” (e.g. industrial districts) can also supply such organizing principles and 2) because it is never made clear why firms should supply more, as it were, of these (Foss 1996a&b). But this is not necessarily to deny that there may be something to the Kogut and Zander story – only that this needs further and deeper analysis, and that such analysis may be best undertaken in terms of the modern economics of organization.

In general, we have tried to demonstrate how the key insights of the knowledge-based approach may be reformulated in terms of standard organizational economics insights, and that the two approaches are, therefore, not in fundamental contradiction to each other. Moreover, we would also press the claim that the knowledge-based approach can learn from the economics of organization. For example, for an approach that puts so much stress on resources, capabilities, etc., it is remarkable how little actual analysis is carried out of the process of applying resources in production

(Spender 1994). In contrast, the economics of organization is pretty much about the resource-application process.

## IV. Challenges to the Economics of Organization?

In the previous section, we tried to demonstrate how many of the purportedly new and different insights in the knowledge-based approach are really either well-known or consistent with standard reasoning in organizational economics. To make this clear, we tried to rely on as simple ideas as possible. However, we also, if perhaps implicitly, made concessions to knowledge-based arguments by giving economic interpretations of institutionalization and limited computational capabilities. Thus, we *do* think that the knowledge-based perspective offers instructive lessons for organizational economics and that not everything is fully reducible to organizational economics. This section describes some of these challenges.

### A. *Learning and Path-Dependence*

According to knowledge-based theorists, a major intellectual asset of the knowledge-based approach is that it explicitly addresses processes of intra- and interfirm-learning, whereas learning processes are almost completely neglected in the economics of organization, only vaguely appearing under the guises of human asset specificity (Williamson 1985, 1996). The importance of learning is not only a matter of maintaining competitive advantage, but also a matter of economic organization. For example, firms may consciously adopt organizational forms that imply a transaction cost penalty relative to other forms, but stimulate organizational learning. Thus, firms may increase costs related to incentive conflicts *in order to* lower the costs of learning, just as firms may increase transaction costs in order to lower production costs, as in the classic work of Alfred Chandler (1990).<sup>34</sup>

While it is true that learning is largely neglected in the economics of organization, it is *also* true that learning is something of an empty box in the knowledge-based perspective. And it is also true that organizational economics, being largely an extension of mainstream theory, may draw on the idea of learning as updating of subjective probabilities in the light of new information. However, knowledge-based critics may criticize this rather narrow conception of learning, and perhaps rightly so. For example, learning as a cognitive process in the sense of dynamics in a space of representations (as in Denzau and North 1996) is completely neglected in virtually all of economics which tends to see learning as purely a matter of information processing. To the extent that knowledge-based theorists deem this central to their perspective (see Kogut and Zander 1996), here clearly is something that cannot be easily translated into organizational economics.

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<sup>34</sup> Kirsten Foss (1998) argues that while learning has admittedly been neglected in organizational economics, it is possible to draw on established insights about learning and examine the consequences for economic organization. Thus, she suggests to explore the issue of the boundaries of the firm in the context of the changing division of labour and insights about incremental learning and innovation, all cast within the basic property rights framework (like the one we have used in this paper). Increasing division of labor creates the endogenous change that drives the system; it both results from the allocation of (user) rights (broader definitions providing room for more experimentation), and drives the re-allocation of rights, as new divisions of labor turn out to be successful. A framework of incomplete contracts provides the room for experimental activity, and the allocation of residual rights determines the coordination of the intra-firm division of labor.

## *B. Opportunism*

Many knowledge-based theorists argue that the main difference between the two approaches lies not only in differing treatments of production and organization knowledge, but also in the knowledge-based approach not being dependent upon using the assumption of opportunism (or related concepts, such as moral hazard) (Ghoshal and Moran 1996; Madhok 1996; Conner and Prahalad 1996).

It is true that most of the modern economics of organization builds on this assumption, and that it is generally held within this approach that it is not possible to explain the main bulk of economic organization without this concept (Williamson 1996; Foss 1996a&b). It is also true that the assumption has served theorists well, and that a wealth of new insights have been produced building on this assumption. Nevertheless, the knowledge-based critics are right that aspects of economic organization that do not turn on incentive-conflicts have been overly neglected.<sup>35</sup>

On the other hand, the recognition that coordination problems and transaction costs that do not turn on incentive conflicts have been neglected in organizational economics does not mean that these aspects inherently cannot be treated by the theory. For example, Mark Casson (1997) in a recent contribution manages to say a good deal about economic organization from an information cost perspective and without relying on the notion of opportunism. And Bolton and Dewatripont (1994) do the same from a team-theoretic perspective. Wernerfelt (1997) also looks at communication costs. He argues that different constellations of fixed and variable costs of communicating may influence the governance choice. As a starting point, we may think generally of governance mechanisms (here restricted to only firms and markets) as gameforms in which players adapt to changes in the environment and communicate about these changes. The conjecture is that different gameforms will be systematically characterized by different levels of (fixed and variable) costs of making adaptations. For example, the hierarchical gameform requires the least bargaining over prices (has the lowest variable costs of adaptation), but is characterized by high fixed costs (because of the fixed wage). In the case of the market gameform, the variable/fixed cost proportion is the inverse. In other words, when choosing gameforms for regulating their trade, players confront a trade-off between fixed and variable costs of communicating/adapting.

These are indeed promising avenues that help correcting a strong bias in the modern economics of organization. Moreover, in various ways they link up with the knowledge-based approach. For example, the emphasis on communication costs fits naturally with a knowledge-based view, since it is incompatible, non-overlapping, etc. knowledge that gives rise to these costs. Future work on the knowledge-based perspective may be well advised to relate to these formal contributions.

## **V. Conclusion**

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<sup>35</sup> For example, Hart (1995) argues that in the absence of opportunism, the first-best outcome can always be realized – a claim that requires the theorist to abstract from possible instances of misallocation due to distorted information, communication costs, different world-views, and other instances of bounded rationality.

This paper has had a triple purpose, namely to 1) to facilitate dialogue between proponents of the new knowledge-based approach and more “traditional” proponents of the economics of organization, 2) dispel false claims of insurmountable differences between the two approaches, and 3) establish what is genuinely different in the knowledge-based approach. As a starting point, we have tried to address these points in an admittedly provocative way, namely by trying to reduce as far as possible basic knowledge-based propositions as these apply to both economic organization and competitive advantage to very simple contractual economics insights.

However, this can only be a starting point, since there is not complete overlap between the two approaches, and a full reduction of the knowledge-based approach to standard economics of organization insights is not possible. Most notably, learning, cognition, and path-dependence are not in any way satisfactorily integrated into the modern economics of organization, although we have argued that here, too, insights from this body of theory are likely to further research.

Thus, the overall message that flows from this paper is to not overestimate differences, and in fact to join forces in a constructive intellectual venture. Both the knowledge-based perspective and organizational economics have identified complementary determinants of economic organization. However, the exercise undertaken here has also had a critical purpose. For example, we believe that a number of knowledge-based ideas are shallow, notably the attempt to address the existence of the firm in this approach. We have also pointed to the lack in the knowledge-based approach of a consistent and precise microfoundation for more aggregate concepts such as “routines”, “capabilities”, etc. But if such central ideas are rather shaky, it would also seem to be warranted to be somewhat skeptical towards the normative implications derived from the knowledge-based approach and towards the critique launched by proponents of this approach towards the more “traditional” economics of organization.

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