

THE KNOWLEDGE-BASED APPROACH AND ORGANIZATIONAL
ECONOMICS: HOW MUCH DO THEY REALLY DIFFER?

AND HOW DOES IT MATTER?*

KIRSTEN FOSS and NICOLAI FOSS

RESPECT

Department of Industrial Economics and Strategy

Copenhagen Business School

Nansensgade 19,6

1366 Copenhagen K

Denmark

+45 3815 2556/62

eskimp@cbs.dk esnjf@cbs.dk

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Abstract

The knowledge-based approach and organizational economics are usually seen as offering opposing approaches to the explanation of organizational phenomena. Relying on a taxonomic framework from the philosophy of science, we argue that many differences between these approaches are more apparent than real. Thus, many insights associated with the knowledge-based approach can be reduced to organizational economics insights. However, not everything can be thus reduced. There is an important residual, comprising differential cognition, learning, and bounded rationality.

The knowledge-based approach (henceforth, “KBA”) and organizational economics (henceforth, “OE”) are often seen as offering rival explanations of organizational phenomena, such as the existence, boundaries, and internal organization of the firm. The main differences between the

two perspectives would appear to turn on how the firm is conceptualized, the explanatory variables that are used, and behavioral assumptions. But how different are the KBA and the OE really? And how does it matter in terms of research strategies?

So far, there has been little dialogue between proponents of OE and the KBA, communication being limited to KBA writers criticizing OE. There may be many reasons for this, one possible reason being that different disciplinary and institutional backgrounds (economics and universities vs. business administration and business schools) are involved. However, we do believe that dialogue is necessary to clarify differences and similarities, so that it can become clearer in what ways the two theories can complement each other in the understanding of organizational phenomena. Notably, there is the possibility that KBA writers have pointed to phenomena and insights that, while crucial to economic organization, have been neglected by proponents of OE (or *vice versa*). However, there is also the opposite possibility that what KBA writers are saying is not at all in conflict with OE, but is merely expressing insights about economic organization in a different theoretical language. Or it may be the case that some differences are only apparent, while others are real. These possibilities need to be explored in detail – an exercise we believe to be conducive for a more fruitful dialogue between proponents of the KBA and OE.

In principle, there are two potentially complementary ways of resolving differences with respect to the explanations provided by rival theories, namely empirical tests and conceptual analysis. In the choice between these two research strategies, conceptual analysis takes logical priority. This is because if a conceptual analysis reveals that there are few or no real differences between the relevant theories, there is no need to carry out empirical tests of which one offers the best explanation. However, so far little analysis of the similarities and differences between the KBA and OE has been undertaken. Our aim is to fill the lacunae. In fact, we believe this to be

the first rigorous analysis of its kind. Specifically, we argue that an analysis of the basic assumptions and insights of the KBA reveals that many of these are not fundamentally in conflict with basic OE assumptions and insights. In fact, it is possible to cast many of the KBA insights in OE “language”. However, not everything in the KBA may be “translated” into OE; there is an important residual left.

The analysis is organized around four questions, which are reflected in the structure of the paper. First, we ask how relations between theories can best be analyzed and put forward a framework for handling this. Second, we ask if there is a shared language in which OE insights can be phrased, and argue that property rights economics (e.g., Barzel, 1989) is such a shared language. The third question is, Are the KBA and the OE really so different? We address this question using the language of property rights economics, and conclude that there is a huge overlap between KBA and OE. However, the overlap is not complete. Specifically, what is distinctive about the KBA is its stress on cognitive limitations, while organizational economics puts much less explanatory weight on this. In contrast to a prevalent position among KBA writers (e.g., Conner and Prahalad, 1996), we do not consider the issue of opportunism to be truly distinguishing. We finally discuss how this matters for OE and KBA. For example, would they be more complete theories if they adopted the basic assumptions of the other approach?

A FRAMEWORK FOR ANALYZING RELATIONS BETWEEN THEORIES

As already stated, the relation between the KBA and OE is often seen as one of rivalry. To quote two proponents of the KBA:

Our view differs radically from that of the firm as a bundle of contracts that serves to allocate efficiently property rights [i.e., OE]... Rather, we suggest that organizations are social communities in which individual and social expertise is transformed into economically useful products and services ... Firms exist because they provide a social community of voluntaristic action structured by organizing principles that are not reducible to individuals (Kogut & Zander, 1992: 384).

One would perhaps expect conflicts between the KBA and OE to be settled through empirical tests. However, work here has been very meager, so far being limited to one tentative study (Poppo & Zenger, 1995). Empirical work that aims at testing the predictions of the KBA (Kogut & Zander, 1993) does not control for a possible competing OE explanation, and *vice versa* (Klein & Shelanski, 1995). Indeed, empirical work in this area is bound to be fraught with severe difficulties of operationalization of key concepts such as capabilities, difficulties of separating, for example, asset specificity from the specific human capital embodied in capabilities, etc. We therefore believe that much more conceptually oriented analysis of the relations between these theories should be undertaken. The question then is how to proceed with such an analysis.

In order to be able to discuss the relation between the KBA and OE in a more precise manner, we rely on Krajewski (1977). He suggested a useful framework for classifying and discussing relations between different theories. The taxonomy in table 1 reflects this framework. We use Krajewski's framework and taxonomy as a heuristic tool. Our aim is not to unambiguously place KBA and OE in one of the categories of table 1. Rather, the taxonomy provides useful insights with respect to the dimensions in which theories may differ.

XXXXXXXXXX *Insert Table 1 about here* XXXXXXXXXXXX

The taxonomy maps possible relations between two theories, T_1 and T_2 , in terms of their domain of application (D) (i.e., their *explanandum*) and their theoretical language (V) (i.e., their *explanans*). The domain of application refers to what the theory is designed to explain. For example, OE is designed to explain the existence, boundaries and internal organization of firms (cf. Alchian and Demsetz, 1972; Barzel, 1989; Coase, 1937; Hart, 1995; Williamson, 1985, 1996). Initially, the KBA was developed to address competitive advantage (Barney, 1986; Wernerfelt, 1984), but has increasingly expanded its *explananda* phenomena to also include those traditionally considered in OE, see table 2.

XXXXXXXXXX Insert Table 2 about here XXXXXXXXXXXX

Table 2 reveals that the KBA and the OE have overlapping domains of application ($D_1 \cap D_2 \neq \emptyset$). They are therefore commensurable, which is a precondition for comparing them. Given commensurability, there are then several possible relations between KBA and OE, of which the extreme possibilities are equivalence and contradiction. The possible relations between the theories all intimately involve the issue of what is the relation between the respective theoretical languages. The concept of theoretical language refers to the explanatory framework of the theory, including terminology, explanatory variables, behavioral assumptions and type of explanation. For example, while OE relies on an explanatory framework largely derived from mainstream economics, the KBA relies instead on a framework drawn from strategy, organizational and behavioral research and emphasizes bounded rationality, routines, capabilities, and the like rather than incentives, asymmetric information, property rights and contracts. A key question then is what is the relation between these theoretical languages. For example, can equivalence be established through translation of KBA language into OE language or *vice versa*? If this cannot be done, this still leaves us with numerous other possibilities. For example, the theories may be contradictory as asserted by some proponents of

the KBA (e.g., Kogut & Zander, 1992; Madhok, 1996). In terms of table 1, this means that while the domain of application (D) of the theories is the same, the theories work with different untranslatable languages (V), and their implications with respect to the domain of application contradict each other (i.e., $T_2 \Rightarrow \neg T_1$ and $T_1 \Rightarrow \neg T_2$).

We shall argue that the relation between OE and KBA is neither one of equivalence, nor one of contradiction. In order to find out what is the true relation between KBA and OE, we begin by examining to which extent it is possible to arrive at the same insights by trying to translate the theoretical language of KBA into OE language. This allows us to find out what is not just “semantic” differences, but genuine theoretical differences. However, for that purpose we need a “translation operator” (“L” in table 1). We argue that property rights economics (Barzel, 1989; Furubotn & Richter, 1998) is one such possible translation operator. In other words, we try to state concepts such as routines and capabilities in terms of property rights economics. If this can be done successfully, we infer the conclusion that KBA can indeed be translated into OE. If this is only partially successful, other possibilities must be examined.

We may begin by asking whether a *reduction* is possible? Two general types of reduction may be distinguished. First, a homogeneous reduction is obtained if it is possible to show that KBA is a special case theory of OE (or *vice versa*), in the sense that one can obtain OE by adding hypotheses (A) to KBA, and that the theoretical language of KBA is a subset of OE. Second, in the case of a heterogeneous reduction we also need bridging principles (S), which generally refer to how one moves from one level of analysis to another one. For example, there may be principles that explain how the notion of “routine” is obtained from aggregating individual actions. Finally, there is the possibility of *correspondence*. In a homogenous relation of correspondence, the two theories apply identical explanatory apparatuses, and T_1 is an adequate approximation to T_2 within D_1 , while the more general theory T_2 corrects T_1 in $D_2 - D_1$ by taking into account new variables, assumptions, etc. A final

possibility is the heterogeneous relation of correspondence, which differs from the homogeneous relation by taking into account differences in theoretical languages. We shall make reference to these possibilities in the course of the discussion, although we wish to restate that it is not our aim to place KBA or OE unambiguously in one of the categories of table 1.

THE PROPERTY RIGHTS APPROACH:

A SHARED ORGANIZATIONAL ECONOMICS LANGUAGE

OE is a collection of theories, including the transaction cost (Coase, 1937; Williamson, 1985, 1996), the agency (Holmström, 1982; Holmström & Milgrom, 1991; Jensen & Meckling, 1992), the measurement cost (Barzel, 1989), the information cost (Casson, 1994), the team (Marschak & Radner, 1972), and the incomplete contracts (Hart, 1995) perspectives. To be sure, the languages of these theories differ. For example, one may distinguish between OE models that make use of the assumption of incentive conflicts (e.g., opportunism) and those that do not (e.g., team theory). Moreover, there is an overall distinction between models founded on the notion of incomplete contracts, and models founded on the notion of complete contracts, such as agency theory. The incomplete contract approach stresses the importance of high cost of drafting complete contracts, while complete contract theories stresses the high cost of monitoring contractual compliance.

While assumptions about the information that agents possess, the incentives they confront, and their cost of drafting and monitoring contracts are important for explaining different kinds of institutional arrangements, they do not fundamentally distinguish the theories. Our position therefore is that these differences simply reflect dialects of the same overall theoretical language – one with a vocabulary consisting of self-interested behavior, economic equilibrium, transaction

costs, and property rights (Furubotn & Richter 1998). This overall language is the *property rights approach* (Alchian, 1965; Barzel, 1989; Coase, 1960; Demsetz, 1964; Eggertson, 1990; Jones, 1983; Libecap, 1989; North, 1990). In fact, most OE approaches can be subsumed under the property rights approach, because these all look at different costs of specifying, exchanging and enforcing property rights. Thus, in order to focus on the more fundamental differences in the language between OE and KBA, we can use the overarching language of the property rights approach as a translation operator.

Characteristics of Property Rights

There are numerous characteristics of property rights that are salient to the present discussion. We present these in the following.

Types of rights. property rights are the rights people hold over assets, such as physical, human, financial, and intellectual property assets. More specifically, they include the following kinds of rights (Alchian, 1965; Eggertson, 1990):

1. *Use 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.
4. *Rights to transfer* permanently to another party all the above mentioned rights over an asset – that is to alienate or sell an assets.

Rights and Relationships. Property rights define the *relationships* among individuals with respect to scarce assets. Therefore, property rights are social institutions. However, it is important to observe that property rights systems may exist at several levels, among which there is a hierarchical relation. Thus, on the societal level, the law, norms and mores of society define and delimit the range of privileges granted to individuals to assets. The combination of property

rights and their institutional support is a “property rights system”. However, property rights systems also exist on lower levels than the societal level, notably inside firms (Williamson, 1985). For example, the system of property rights existing in a firm “... is the set of economic and social relations that define the position of each individual with respect to other team members and with respect to the use of resources (Demsetz, 1964)” (Jones, 1983: 456). However, property rights systems inside firms are still constrained by the law and customs of society, as partially defined and enforced by the state (North, 1990).

Preciseness. An important characteristic of property rights is the degree of preciseness with which they are delineated. For example, one may distinguish between *specific* and *residual* rights (Barzel, 1989; Hart, 1995). Specific rights are those rights that are specified in contracts and allocated between the transacting parties before any transaction takes place. Residual rights are those rights that are not constrained by stipulations in contracts or by the law. Both user and income rights can be either 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). In firms rights and obligations may be more or less clearly defined. For example, if all rights are truly perfectly defined, according to the so-called “Coase theorem” (Coase, 1960), this literally means that

- all possible uses of assets are fully known
- all returns from all uses of all assets are perfectly known
- all legitimate and illegitimate uses of assets are perfectly specified
- all this is perfectly enforceable.

If all rights are completely defined in this way, there cannot, by definition, arise any conflicts over the use of scarce resources or the returns from assets, because individuals do not have any

discretion in the use of resources. For example, intra-firm conflicts cannot arise. Indeed, it would be hard to explain why there should be firms in such a world (Coase, 1937). Of course, this is a highly unrealistic situation. In actuality, all rights are far from perfectly defined, and this opens the door for organizational phenomena. From a property rights perspective, the reason for such lack of preciseness is to be found in the existence of *transaction costs*.

Delegation. Rights to decide between uses of assets may be delegated to others (Jensen & Meckling, 1992). The person who has the rights to determine the set of possible uses as well as the right to decide on delegating decision rights is said to possess 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 (Hart, 1995).

Property Rights, Contracts, and Transaction Costs

Historically, the property rights approach emerged from the insight that what is exchanged are not assets *per se*, but rather the rights to those assets (Coase, 1960). Contracts, whether formal or informal, are used to define the terms of transfer of rights. However, the exchange of rights is not costless. For example, 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, use 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.

To specify and to contract over the different possible uses of assets are clearly costly actions – more precisely, they involve transaction costs. In the property rights framework,

transaction costs are conceptualized as the costs due to the "transfer, capture and protection of rights" (Barzel, 1989: 2). When such costs exist, not everything will be specified in contracts. Notably, the employment contract is left partly open because of prohibitively high costs of specifying in detail all rights and obligations of the employee in all future conceivable situations. Related to this, the authority relation arises from the presence of transaction costs, because in the presence of such costs, incomplete contracts will give rise to conflicts and disagreements over the uses of assets. Assigning the right to decide how assets should be used in situations that are not covered by the contract is often a low-cost way of resolving this problem. However, the extent to which authority is necessary depends on the nature of the property rights system of the firm, more specifically, the norms and social values existing inside it.

We shall use these ideas to restate and reinterpret fundamental ideas and insights in the KBA. However, before we can do this, we need to briefly state what are the main ideas and insights in the KBA.

THE KNOWLEDGE-BASED APPROACH

The knowledge-based perspective very much reflects a number of diverse influences, and arguably exists in somewhat different versions. In this section, we shall briefly restate what we believe are the main insights associated with the KBP. In particular, we focus our attention on how the KBA addresses the explananda of competitive advantage, the boundaries of firms, the existence of firms and the internal organization. Briefly, the theoretical language that is used to address these explananda consists of concepts as resources, routines, capabilities, learning, and bounded rationality, and insights relating to these (see figure 1).

XXXXXXXXXX *Insert Figure 1 about here* XXXXXXXXXXXX

Main Insights and Propositions of the Knowledge-Based Approach

Competitive advantage. Conventionally, the KBA is seen as beginning with the work of Edith Penrose (1959). Although the main concern of Penrose was to discuss the limits to firm growth, insights have been further refined by modern proponents of the KBA to develop a theory of the competitive advantage of firms. They begin from the same premise as Penrose did, namely from the essential notion of the firm as a bundle of *heterogeneous* resources. Because resources 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 rents.

Although resources can be any asset that may be a strength to a firm (Wernerfelt, 1984; Barney 1991), most interest has centered on internally accumulated resources, such as routines and capabilities, rather than on those that can be purchased on factor markets (Dierickx & Cool, 1989). Routines are an important aspect of what allows “multiple individuals [to] integrate their specialist knowledge” (Grant, 1996: 112). Indeed, some argue that “[r]outines are the skills of an organization” (Nelson & Winter, 1982: 84). This is because they embody the knowledge needed for repeatedly implementing the (specialized) services of resources in some specific context. Much of this knowledge is tacit and routines may themselves be partially tacit (Nelson & Winter, 1982). This implies that there is a conservative quality to routines. However, often firms are confronted with tasks that go beyond what pre-programmed routines are capable of handling. For example, activating a new productive task, or undertaking an organizational restructuring, or trying to duplicate or modify an existing routine, etc. require conscious action on the part of management. 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.

The KBA analysis of competitive advantage is founded on these basic insights (Barney, 1986, 1991; Dierickx & Cool, 1989; Peteraf, 1993; Wernerfelt, 1984). The primary contribution of this work consists of an analysis of the conditions under which resources yield rents. To sum up this, now fairly well known, analysis, only heterogeneous, rare and hard-to-imitate resources that are, moreover, acquired in imperfect factor markets (Barney, 1986) can be rent-yielding strategic assets to firms.

The boundaries of the firm. Path-dependencies and tacit knowledge are important in the application of the KBA to issues relating to economic organization, such as the boundaries of the firm. A starting point is that the creation of a productive organization is a time-consuming process of learning about how to utilize and coordinate productive assets. This results in the creation of routines and capabilities. These 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 & Teece, 1992). This in itself suggests knowledge-based limits to how far the firm may efficiently diversify its activities, that is, its path-dependent process of growth places limits on where its boundaries are placed. For example, excess management capabilities may be created as a natural by-product of the firm's activities (Penrose, 1959), but may only be deployed in closely related industries. In general, firms may avoid undertake activities that require dissimilar capabilities. Instead, the services from such capabilities may be acquired through markets or inter-firm relations, depending on the degree of complementarity of activities (Richardson, 1972). Typically, very specific and strategically important routines and capabilities have to be deployed internally, due to the absence of markets for these assets (Dierickx & Cool, 1989).

To sum up, in the KBA the boundaries of the firm are seen as determined by knowledge-based considerations. Specifically, knowledge assets that are hard to trade 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. It is important to note that this is claimed to hold quite independently of considerations of incentive conflicts stemming from opportunism, etc.

The existence of the firm. According to KBA writers, the issue of the existence of the firm can be addressed in terms of knowledge-based reasoning rather than in terms of opportunism, etc. Thus, according to Kogut and Zander (1992), firms can – because of their function as moral communities and bodies of what they call “higher-order organizing principles” – cultivate learning processes and achieve coordination that are inaccessible under market relations. Grant (1996) also argues that firms can develop and utilize knowledge more efficiently than markets are capable of. And Conner and Prahalad (1996) construct a stylized setting, in which they try to demonstrate that what they call the “knowledge-substitution” and “flexibility” effects may take place more efficiently under hierarchy than under market. While the former effect relates to direction, where, in a sense, the knowledge of the hierarchical superior at least partly “substitutes” for that of the inferior (Demsetz, 1988), the latter effect refers to the ease with which the parties’ obligations and duties are changed during a contractual relationship (Coase, 1937). These different KBA ideas can be summed up thus: 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.

Internal organization. Finally, some writers claim that the KBA has implications for understanding internal organization that are completely different from OE (Ghoshal & Moran, 1996; Ghoshal, Moran & Almeida-Costa, 1995). According to them, empirical evidence from big companies suggest that they do not fundamentally use the kind of control and incentive mechanisms in the workings of their internal organization that an OE perspective (purportedly)

would lead one to recommend. Rather, these companies 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. This assists “... the development and utilization of local knowledge for local initiatives” (Ghoshal, Moran & Almeida-Costa, 1995: 752). In contrast, OE is claimed to be “bad for practice” (Ghoshal & Moran, 1996), because it operates with an overly cynical view of human nature. Thus, to follow the prescriptions flowing from OE will result in perverse psychological responses and impede the development and utilization of local knowledge for local initiatives.

TRANSLATING THE KNOWLEDGE-BASED APPROACH

According to KBA scholars (e.g., Kogut & Zander, 1992; Ghoshal & Moran, 1992), the ideas that we have tried to summarize in the above section are either in conflict with OE or simply outside its domain. 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 this section. As we shall argue, many of the explanatory concepts and insights of the KBA can *themselves* be interpreted in terms of OE (using the language of property rights economics). Thus, in a sense we take the theoretical language of the KBA as our explanandum. Figure 2 below illustrates our reasoning.

XXXXXXXXXX *Insert Figure 2 about here* XXXXXXXXXXXX

Resource Heterogeneity

Arguably, the key dimension of resources in the KBA is their heterogeneity, both within and across firms. Ultimately, it is heterogeneity that explains performance differences between firms and why, for example, different firms organize different activities. What has OE to say about the issue of heterogeneity?

Consequences of heterogeneity. Proponents of the property rights approach have always perceived valuable assets as heterogeneous (e.g. Alchian & Demsetz, 1972; Barzel, 1982). Not only do different assets have many and different uses, but even assets of the same type are heterogeneous. From this, theorists have drawn conclusions that are actually remarkably close to those of the KBA. For example, property rights theorist Harold Demsetz long ago pointed out that in the presence of uncertainty, less-than-fully-mobile factors and private information about the cost or benefits of realizing different plans “... a differential advantage in expanding output develops in some firms” (Demsetz, 1973: 1). Thus, heterogeneity is clearly tied to competitive advantage. Demsetz also argued that superior private information about the true value of heterogeneous resources, or luck in obtaining rights to these assets at a price below value, was a necessary condition for competitive advantage – a key conclusion in the knowledge-based analysis of competitive advantage (Barney, 1986). 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.

Causes of heterogeneous market assets. According to KBA writers (Dierickx & Cool, 1989), two types of resources are particularly likely to generate long-lasting rents. These are internally accumulated market assets and organizational assets, such as routines and capabilities. Examples of the former category are brand names and reputations. However, KBA writers do

not give an account of why these resources are heterogeneous and why they are valuable. We believe that OE is uniquely positioned to provide such an explanation. It may proceed along several possible lines.

A possible starting point is that variability in the quality of the attributes and services from products entails waste from, for example, search and screening activities, that is, activities aiming at capturing rights to unspecified attributes of products (Barzel, 1982). By reducing such variability, some of this waste may be eliminated by setting up different institutional solutions, such as product guarantees, long term service contracts, and protected brand names (Akerlof, 1970). The differential accumulation of a reputation for honesty across firms depends on their historic records of being able to keep a uniform quality of products. In this case, they have accumulated heterogeneous brand name capital that reflects differences in their reputations among consumers (Barzel, 1982). A good reputation is valuable to a firm because when buyers believe that sellers will not misrepresent product quality, they will spend less on ascertaining the quality of the products on offer, and firms may therefore raise the prices of their products.

Causes of heterogeneous organizational assets. Of course, competitive advantage is not just a matter of such market-oriented resources as reputations. One possible point of departure for an understanding of valuable organizational assets is Alchian and Demsetz (1972). They argue that sometimes "... gains from specialization and cooperative production may better be obtained within an organization like the firm" (p.75), because continuity of association among resource owners and specialized monitoring services reduce the costs of ascertaining quality differences across heterogeneous resources. Both depend on the specific allocation of property rights inside firms. First, continuity among resource owners is a matter of the duration of contracts. Second, the manager is in a unique position to acquire superior information about the diverse services that can be extracted from heterogeneous resources of variable quality because he has the right to monitor employees. Based on

this information he is also able to specify property rights – that is, specify the rights and obligations of employees – in ways which will yield the highest returns. Given this, efficiency differences between firms are “... a result not of having *better* resources but in *knowing more accurately* the relative productive performances of those resources” (Alchian & Demsetz, 1972: 94; emphasis in original). Thus, an important source of competitive advantage lies in what may roughly be called “organizational factors”.

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 of competitive advantage 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 lower for the monitor within the firm, than for anyone else, competition for superior resources will be imperfect. This reasoning adds a dimension to the knowledge-based approach that is oddly absent in its present version – namely the actual organization and application of various resources in production. This process of application is made effective through contractual devices (implicit as well as explicit) and monitoring and enforcement arrangements (including bonding and the like) – in other words, the property rights system of the firm.

Causes of heterogeneous routines. According to the KBA, firm-specific assets, such as routines and capabilities, are particularly difficult to imitate. The reasons normally given are that these assets are particularly likely to encapsulate knowledge that is 1) tacit, 2) firm-specific, and 3) path-dependent. But what is the economics of this? And what is routines and capabilities from an OE perspective?

We suggest that – as a first abstract approximation – routines are sequences of activities that are carried out as individuals exercise their use rights over assets. As we argued earlier, if

there are no transaction costs, all rights will be perfectly specified. In such a world, all activities will be pre-planned, and routines will simply be the execution of a fully specified program. This means that the skill-like, partly unconscious character of routines (Nelson & Winter, 1982) will not obtain, which is inconsistent with the KBA. In order to explain routines as conceptualized in the KBA, we have to introduce transaction costs. Given transaction costs, we may explain routines as solutions to recurrent coordination problems among individuals in situations where rights are not perfectly defined. As we explained earlier, imperfect definition of rights implies that individuals have discretion with respect to the use of scarce assets. Of course, discretion may be useful, for example, for gaining knowledge from experimenting with different ways of using assets, but discretion may also cause problems of shirking and problems of misallocation due to lack of coordination of complementary activities carried out by different agents. However, with repeated interaction in recurrent situations, a convention may emerge as a solution to coordination problems (Sugden, 1986).

In property rights terminology, such a convention is a self-inflicted restriction on the exercise of use rights where the restrictions are in accordance with the interests of the holder of the rights. These restrictions make the behavior of each individual more predictable relative to a situation without the convention, and establish a stable pattern of behavior, that is, a routine. The firm-specific element of routines can be interpreted as a consequence of different historic circumstances under which a convention emerges (Sugden, 1986). Such circumstances include different players, the physical layout of the firm, and the organizational structure as defined by the formal allocation of use and income rights. They are therefore not generally transferable to other settings. Since routines are responses to imperfect information, it may be difficult and costly to try to augment routines in order to reach more efficient outcomes. This accounts for persistent heterogeneity of routines across firms. From an economic perspective the path-dependent aspects of routines may be translated into a proposition about sunk costs of developing conventions.

Causes of heterogeneous capabilities. Consistent with the KBA, we take capabilities to reside on the level of management. More specifically, we interpret capabilities as management's skills with respect to the exercise of their residual rights to control the uses of human and physical assets. By exercising this control, management may influence the development of routines. First, conventions do not emerge in a vacuum; for example, managers may create environments that are more or less conducive to the evolution of cooperative solutions. Second, 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 (Miller 1992). In property rights terminology, management creates favorable expectations with respect to the value of the property rights granted to employees. The ability of management 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 quality of a capability.

Implications for the Knowledge-Based Approach to Economic Organization

A key knowledge-based idea is that the issues of the existence, boundaries, and internal organization of firms should be cast in knowledge-based terms. However, we have argued that many of these knowledge-based terms are themselves given to explanation in terms of OE reasoning. In this section we examine what this implies for KBA explanations of economic organization.

The boundaries of the firm. According to KBA theorists, the boundaries of the firm should be explained in terms of the specificity and non-tradeability of knowledge assets, such as routines and capabilities. This is not in contrast to OE reasoning (e.g., Williamson, 1985). On the contrary, OE identifies the causes of the transaction costs that make some assets hard to trade in markets.

Some KBA theorists (e.g., Kogut and Zander, 1992) have argued that what ultimately sets the KBA apart from OE is that KBA is much more explicit about productive knowledge that cannot be specified in blueprints (i.e. tacit, skill-like knowledge). Such knowledge, they argue, holds the key to understanding the boundaries of the firm. However, it is not made clear why the coordination mechanisms characterizing firms are more efficient than markets in making use of tacit, skill-like knowledge. In order to understand this, we can make use of property rights arguments. Thus, we may associate tacit, skill-like knowledge with imperfectly specified rights to valuable attributes of assets, notably the human capital of employees. Given high costs of writing explicit contracts over such knowledge, the firm may have advantages relative to market contracting, because its property rights system allows it to make less costly use of the services that tacit human capital may yield. This is because the continuous association between the employee and the firm allows the manager to extract information about the true skills of employees. Finally, the firm is particularly efficient in enforcing the implicit elements of contracts (Williamson, 1996) such as the norms and conventions that emerge from the continued interaction among employees. This leads directly to the issue of the existence of the firm.

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., Conner & Prahalad, 1996). A problem is that exactly the same has been claimed on behalf of markets (Hayek, 1945). This is not denying that there may such knowledge-based explanations of the existence of the firm may be developed. However, we need discriminating principles that allow us to tell when markets will do the job and when firms will, and unfortunately only very few knowledge-based contributions try to supply the relevant discriminating principles (e.g., Conner & Prahalad, 1996) or are even aware that there is a problem.

In the light of OE, the discriminating principle turn on the transaction costs involved in the coordination of productive activities (Alchian & Demsetz, 1972; Coase, 1937; Foss, 1996&b; Putterman, 1995). As we have repeatedly argued, firms may reduce contracting, monitoring and enforcement costs and thereby maximize the rents that a productive team may create relative to market organization of the same team. From the perspective of KBA writers, this may at best be limited stories, since they do not take into account the important aspects of firms as “cultural entities” (Kogut & Zander, 1996). However, in our view it is not clear how being a cultural entity can be an argument for the existence of the firm, unless this quality reflects the characteristics of a specific property rights. For example, industrial districts, firm networks and other extended forms of governance may also be cultural entities.

The OE perspective on firm-specific norms and conventions is that they are part of the property rights system of a firm. Thereby, OE provides a more thorough understanding of the conditions under which routines and capabilities are efficiency-enhancing aspects of such a system. Specifically, the property rights perspective provides a frame in which it is possible to inquire into how the allocation of rights influences the evolution of informal norms and conventions which are constraints on behavior, that is, routines (Jones, 1983). In our view, therefore, existing KBA explanations of the existence of firms are either consistent with OE or are simply not convincing.

Internal organization. KBA writers have argued that internal organization is better understood in terms of the creation of a shared context and an avoidance of “blunt incentives” (e.g., Ghoshal & Moran, 1996; Ghoshal, Moran & Almeida-Costa, 1995). However, this is not in contradiction to OE. For example, in a property rights interpretation, a shared context means that it is not necessary to expend many resources on specifying rights, since there is a shared understanding of the allocation and definition of rights. More to the point, perhaps, the issue of avoiding “blunt incentives” has been treated in recent OE work (e.g., Barzel, 1989; Holmström

and Milgrom, 1991) in terms of property rights, specifically 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 specific income rights to measurable activities may produce a bias away from activities that are hard to measure, but are vital to the firm. This is an explanation that has particular force in connection with knowledge-related activities, such as R&D, because these are clearly hard to measure and specify in contracts.

Summing Up: Relations between OE and KBA.

So far, we have tried to demonstrate how key insights of the KBA may be reformulated in terms of OE insights, using the property rights language. This raises the question of how we may use the taxonomy in table 1 to cast light over the relation between OE and the KBA.

To begin with, note that OE and the KBA attempt to address the same domain of application (the same explananda) (cf. table 2). However, we have argued that KBA does not provide convincing independent explanations of the existence and internal organization of firms, because KBA arguments here can be directly recast as OE arguments. This effectively means that the true domain of application of KBA is a subset of the domain of application of OE. It is more complicated to sort out the relations between the KBA and OE with respect to how they explain the boundaries of the firm and competitive advantage. Note that the KBA explanation of these relies on concepts – such as routines and capabilities – that are not part of the OE language (explanans). This then raises the issue of what is the relation between the languages used in OE and KBA.

Essentially, we have argued that the language of the KBA (V_1) may to a large extent be translated into the language of OE (V_2) (cf. figure 2). This is because concepts such as routines, capabilities, and heterogeneity could to a large extent be given an OE interpretation. Therefore, the KBA explanation of the boundaries of the firm and competitive advantage may be translated into

OE insights, but only after first translating insights about routines and capabilities into OE insights. More specifically, OE provided a sort of “microfoundation” for these more aggregate concepts. Note that in order to build up from OE insights to KBA insights one needs bridging principles (S) that help us to come from one level of analysis to another level. For example, routines may be seen as emergent properties of interaction between agents constrained by transaction costs and the property rights system of the firm. On the other hand, we do not believe that it is possible to translate the other way around, that is, translate OE language into KBA language. This is because there are no bridging principles that will allow us to go from routines and capabilities to property rights, asymmetric information, transaction costs, etc. As a first approximation, this means that there is a “one-sided correspondence” between the two languages ($V_1 \rightarrow V_2$).

Our reasoning so far points to either a heterogeneous reduction or a heterogeneous correspondence (cf. table 1) as the “true” relation between KBA and OE. In the case of the heterogeneous reduction, the theories have the same implications ($T_2 \wedge A \wedge S \Rightarrow T_1$), provided one of them is supplemented with additional hypotheses (A) and bridging principles (S). In the case of the heterogeneous correspondence, one of the theories approximates the other one in the latter’s domain of application ($T_2 \Rightarrow a T_1$ in D_1), while adding some new implications that cannot be reached by the latter theory ($T_2 \Rightarrow \neg a T_1$ in $D_2 - D_1$). In our view, the true relation between OE and KBA comes closest to that of the heterogeneous correspondence, because OE has implications with respect to competitive advantage, and the existence, boundaries and internal organization that cannot be reached by the KBA. However, it may be argued that we have only been able to reach these conclusions by implicitly side-stepping issues such as bounded rationality, learning, and (differential) cognition, – in short, ideas that relate to the endogenous creation of heterogeneity. Can these ideas be reduced to OE insights? And are they important to the KBA? We discuss this in the following section.

CHALLENGES TO THE ECONOMICS OF ORGANIZATION?

In the previous section, we have tried to “cut to the bone” of the KBA, as it were. One purpose of this exercise is to find out what is genuinely different in the KBA relative to the OE. In fact, we do believe that there are important concepts and insights in the KBA that cannot be reduced to OE insights, and may in fact challenge OE. We discuss some of these in the following.

Bounded rationality and learning. According to KBA writers (e.g., Conner & Prahalad, 1996; Ghoshal, Moran & Almeida-Costa, 1995; Grant, 1996; Spender, 1996) one strength of the KBA relative to the OE is its more explicit treatment of bounded rationality and learning. The treatment of bounded rationality in OE (Williamson, 1985, 1996) is arguably narrow, since it only figures as a constraint on a decision problem. Changing bounds of rationality through, for example, satisficing search activities is not inquired into. And learning only appears in OE as changes in human asset specificity (“the fundamental transformation”) (Williamson, 1985, 1996), while the learning process itself is largely neglected. All this may rightly be criticized, particularly because the emergence and change of firms and property rights systems in firms become hard to comprehend without a more sophisticated theory of learning (Denzau & North, 1994).

However, OE is not inherently cut off from treating learning and bounded rationality. For example, learning by doing requires the exercise of use rights over assets. One may even suggest that the more well specified and easily monitored use rights are, the less can asset users experiment, and the more constrained will their learning be. Experimentation is important as a way of finding solutions to coordination problems (e.g., finding the optimal sequence of activities). Managers holding residual use rights over assets are able to conduct controlled experiments without continuously having to re-negotiate contracts and it is by exercising residual rights that managers change the conditions under which skills, conventions, norms and other

types of socially shared knowledge emerge. This suggests one way in which OE may come better to grips with processes of building routines and capabilities. But obviously much more needs to be done here.

Cognition. In contrast to the narrow view of learning in OE, learning in firms also is a social process of cognitive development in which cognitive categories (e.g. business conceptions) arise and are adopted and possibly changed (Bandura, 1977; Dosi & Marengo, 1994; Penrose, 1959). This goes significantly beyond both the information processing view and conventional views on bounded rationality. If this is what is meant by learning in the KBA, then we acknowledge that here is a genuine challenge to OE. However, so far KBA writers do not appear to have incorporated this cognitive perspective into their reasoning to any great extent: thus, it may also be just as much a challenge to the KBA.

More specifically, it is possible that a cognitive view may have important implications for the understanding of the main explananda of OE and KBA, namely competitive advantage, and the existence, boundaries and internal organization of the firm. For example, we may think of the distribution of competitive advantages in an industry as stemming from both the resources that firms control and the cognition of managers, for example, with respect to how resources should be deployed (cf. Penrose, 1959) and how elements in the external environment should be categorized. Moreover, it may be conjectured that a cognitive perspective has implications also for the remaining explananda. For example, internal organization may be understood in terms of conflicts and disagreements stemming from different cognitive categories, and a major organizational design problem may actually be to create shared cognitive categories. It should be noted that such a cognitive perspective may both further OE (Williamson, 1998) and itself be furthered by OE insights. Thus, on the one hand, the property rights system of the firm may, by defining the social relations and positions of individuals, crucially influence the processes of

interaction that may lead to shared cognitive categories. On the other hand, problems stemming from the delegation of rights, may arise from differential cognition inside the firm, as well as from transaction costs (Miller, 1992). In practice, it may be difficult to separate organizational problems stemming from differential cognition from those stemming from opportunism (a problem that the courts are all too familiar with).

Opportunism. It has been argued that a main difference between the KBA and OE lies in the KBA not being dependent upon the assumption of opportunism (Conner & Prahalad, 1996; Madhok, 1996). It is true that much of the modern economics of organization builds on this assumption, and that it is often held within this approach that it is not possible to explain much of observed economic organization without this concept (Foss, 1996a&b; Williamson, 1996). It is also true that the assumption has served theorists well, and that many new insights have been produced building on this assumption. Nevertheless, KBA critics are right in asserting that aspects of economic organization that do not turn on incentive-conflicts have been overly neglected. For example, Hart (1995) argues that in the absence of incentive conflicts, the optimal outcome can always be realized. But this claim requires the theorist to abstract from misallocation due to misunderstandings, communication costs, different cognition, etc. Opportunism is not the sole cause of management problems!

However, it should be noted that many contributors to OE are actually uncomfortable with the notion of opportunism, because it is not precisely defined compared to the ordinary assumption of self-interest (e.g. Barzel, 1989; Hart, 1985). And Williamson (1985, 1996), who is the inventor of the concept of opportunism, tends to use it in connection with the hold-up situation only. Moreover, not all contributors to OE have made the assumption of opportunism. Instead, they have focused attention on opportunism-independent costs, such as measurement costs (Barzel, 1989), costs of communicating (Segal, 1996; Wernerfelt, 1997), search costs

(Casson, 1994), and costs of storing, retrieving and processing information (Bolton & Dewatripont, 1994; Marschak & Radner, 1972). As these OE theorists point out, it is possible to say a good deal about economic organization without relying on the assumption of opportunism. For example, Casson (1994) argues that decision rights within firms will be distributed according to who has important (“decisive”) tacit knowledge and the costs of communicating this knowledge. And Segal (1996) argues that understanding the managerial task requires that we take account of communication costs: If all computations and observations can be communicated without any cost, it will never pay to concentrate managerial effort (i.e., appoint a manager). Finally, Wernerfelt (1997) argues that the choice between markets, hierarchies and intermediate forms also reflects economizing on costs of communication.

These are indeed promising avenues that help correcting a strong bias in OE. Moreover, in various ways they link up with the KBA. For example, an emphasis on communication costs fits naturally with the KBA. This is because it is largely specific and tacit knowledge that gives rise to communication costs which, in turn, produce coordination problems (Langlois & Robertson, 1995). This, we believe, is one way to interpret the KBA theory of the boundaries of the firm (e.g., Kogut & Zander, 1992; Richardson, 1972): Because of firm-specific and tacit knowledge in firms, it may be more costly to communicate across the boundaries of the firm than inside the firm. Efficient boundary choice may therefore reflect communication costs.

CONCLUSION

In this paper, we have critically compared KBA and OE for the purpose of establishing what is genuinely different in the KBA relative to the OE and in the hope that this will facilitate critical dialogue. Thus, we put forward an overarching methodological framework for comparing the two theories. We next suggested that property rights economics allows us to see that many KBA

insights may be translated into OE insights. We found that while there are many overlaps, the two theories are different. Specifically, we argued that ideas on bounded rationality, differential cognition and learning can be singled out as genuinely different elements in the KBA, whereas opportunism-independent determinants of economic organization are *not*. We fully acknowledge that on the one hand KBA writers have developed important concepts and insights, such as routines and capabilities, however, these need a micro-foundation. On the other hand, OE writers have also developed important concepts, such as transaction costs and property right systems, that are helpful for establishing these micro-foundations; however, we also agree that OE may stand to gain from incorporating ideas on differential cognition, learning and so on (cf. Williamson, 1998). Similarly, OE may benefit from a better understanding of how formal and informal elements of the property rights system interact, and here research is likely to be furthered by attention to what KBA writers have said about norms, social relations, etc. in firms.

Thus, the overall message that flows from this paper is to not overestimate differences. However, what will this mean for research in organizational phenomena? There are several possibilities. For example, the proponents of the KBA and OE could join forces or they could continue to pursue independent research strategies while maintaining a critical dialogue. What makes the first research strategy problematic is that, at least in some manifestations, the KBA is a process oriented theory (cf. the stress put on learning, cognition, etc.), whereas OE is a more static and structure oriented theory. Such theories are hard to align. However, as indicated earlier (in different terms), a process-oriented theory stands to gain from a structure-oriented theory and *vice versa*. This is how the differences between KBA and OE matter. Therefore, future dialogue is highly recommended.

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TABLE 1
A taxonomy of relations between theories

Type	Domain	Theoretical language	Relation
<i>Commensurability</i>	$D_1 \cap D_2 \neq \emptyset$		
<i>Equivalence</i>	$D_1 = D_2$	$V_1 \leftrightarrow V_2$	$T_1 = L_1(T_2)$ $T_2 = L_2(T_1)$
<i>Reduction:</i>			
- <i>Homogenous</i>	$D_1 \subset D_2$	$V_1 \subset V_2$	$T_1 \wedge A \Rightarrow T_2$
- <i>Heterogenous</i>	$D_1 \subset D_2$	$V_1 \rightarrow V_2$	$T_1 \wedge A \wedge S \Rightarrow T_2$
<i>Contradiction</i>	$D_1 = D_2$	$V_1 \neq V_2$	$T_1 \Rightarrow \neg T_2$ $T_2 \Rightarrow \neg T_1$
<i>Correspondence:</i>			
- <i>Homogenous</i>	$D_1 \subset D_2$	$V_1 = V_2$	$T_2 \Rightarrow a T_1$ in D_1 $T_2 \Rightarrow \neg a T_1$ in $D_2 - D_1$
- <i>Heterogenous</i>	$D_1 \subset D_2$	$V_1 \rightarrow V_2$	Same as above

Reproduced from Krajewski (1977: 67) with modifications. The notation is standard set notation; however, some of the expressions used deserve explanation. “ \leftrightarrow ” means that there is a one one to one correspondence (so that double translation between two theories is possible). “L” is a translation operator (metaphorically speaking, a sort of “dictionary”). “ \rightarrow ” is used to indicate a one-sided correspondence (so that double translation is not possible). “ \Rightarrow ” refer to implications of a theory (e.g., “ $T_1 \Rightarrow \neg T_2$ ”) means that the negation of T_2 follows from T_1). “A” refers to supplementary hypotheses. “S” are bridging principles (e.g., principles of aggregation). Finally, “a” means “approximates”.

TABLE 2
The knowledge-based approach and organizational economics:
Explananda and key contributions*

Explanandum phenomenon	Knowledge-based contributions	Organizational economics contributions
Why do firms exist?	Conner (1991), Conner and Prahalad (1996), Grant (1996), Kogut and Zander (1996)	Alchian and Demsetz (1972), Coase (1937)
What factors determine firms boundaries relative to the market?	Kogut and Zander (1992, 1993), Madhok (1996), Penrose (1959), Richardson (1972), Winter (1988)	Hart (1995), Hart and Moore (1990), Williamson (1985, 1996)
What determines firms' internal organization?	Dosi and Marengo (1994), Ghoshal, Moran and Almeida-Costa (1995), Ghoshal and Moran (1996),	Barzel (1989), Holmstrom (1982), Holmstrom and Milgrom (1991), Putterman (1995)
What determines competitive advantage?	Barney (1986, 1991), Peteraf (1993), Wernerfelt (1984)	Kreps (1990), Williamson (1994)

* Note that some of the contributions address more than one of the explanandum phenomena. However, they have been classified according to their main thrust.

FIGURE 1

The explanandum and explanans of the knowledge-based approach

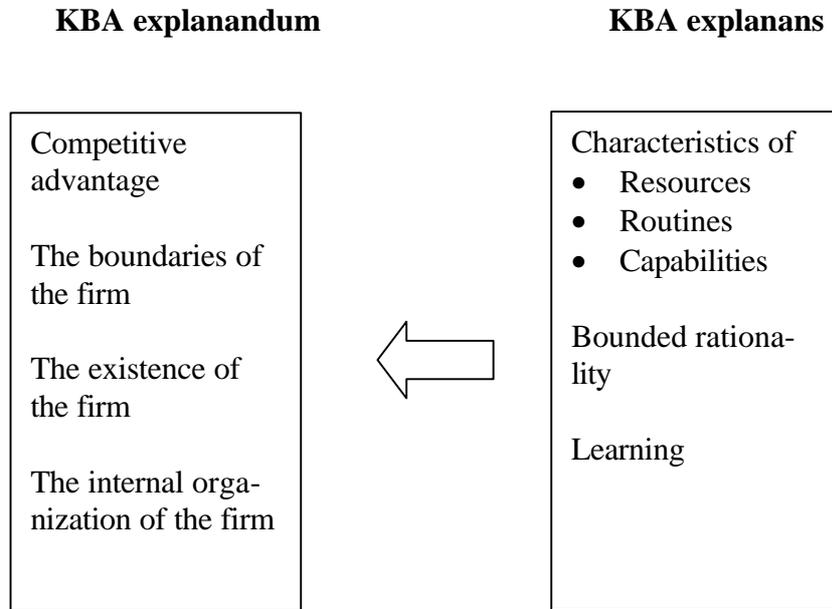


FIGURE 2

Translating the KBA

