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Towards a Learning-Based Theory of the Firm

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Abstract

This paper takes tentative steps towards a new learning-based theory of the firm. Its objective is to advance a separate and empirically relevant answer to the question: why do firms exist? Sometimes learning across the market will be preferred, while in other situations the firm will enjoy the advantage. A predictive theory of the firm needs to unfold these differences between both modes of organization. As in transaction cost economics, therefore, the strategy for deriving propositions is comparative institutional analysis. Given a choice between the market and the firm, which is better? The hypothesis is that learning economies will be achieved when the attributes of learning, information exchange, and the alternative modes of organization are properly attuned to each other. On this basis, several propositions are advanced identifying factors responsible for market or firm advantage. Finally, the steps taken toward a learning-based theory of the firm are captured in three implications for economic theory and for a wider theory of performance differences between firms, which is a major concern in both strategic management and resource-based thinking. Some consequences of these implications are highlighted, indicating the future research agenda.

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ABSTRACT: This paper takes tentative steps towards a new learning-based theory of the firm. Its objective is to advance a separate and empirically relevant answer to the question: why do firms exist? Sometimes learning across the market will be preferred, while in other situations the firm will enjoy the advantage. A predictive theory of the firm needs to unfold these differences between both modes of organization. As in transaction cost economics, therefore, the strategy for deriving propositions is comparative institutional analysis. Given a choice between the market and the firm, which is better? The hypothesis is that learning economies will be achieved when the attributes of learning, information exchange, and the alternative modes of organization are properly attuned to each other. On this basis, several propositions are advanced identifying factors responsible for market or firm advantage. Finally, the steps taken toward a learning-based theory of the firm are captured in three implications for economic theory and for a wider theory of performance differences between firms, which is a major concern in both strategic management and resource-based thinking. Some consequences of these implications are highlighted, indicating the future research agenda.

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Introduction

The significance of learning for the economic development of firms is hardly contested. On the contrary, it is widely acknowledged that differential learning within and between firms is key: learning matters (Williamson, 1999). There is, however, a debate on how to incorporate learning-based considerations into an empirically sound, predictive theory of economic organization while preserving the theory's plausibility and relevance. Central to this debate are the contributions made from the governance and competence perspectives on organizing economic activity (among others, Williamson, 1985; Conner, 1991; Kogut and Zander, 1992; Foss, 1993; Grant, 1996; Spender, 1996; Teece et al., 1997). Learning and knowledge as rich economic, cognitive, behavioral, and social phenomena are most fully addressed in the competence perspective, in particular in its resource-based and knowledge-based variants (Zack, 1999; Dosi et al., 2000; Choo and Bontis, 2002). In this literature, the firm's knowledge is increasingly being considered the principal strategic resource, and the ability to create and apply it the core competence for building and sustaining competitive advantage or economic rent. As such, it points to important issues that are undervalued in the governance perspective. It carries through the emphasis in strategic management on a firm's competitive advantage as realized through superior productive activity (Conner & Prahalad, 1996), it stresses the need to incorporate intangible assets such as knowledge (Liebeskind, 1996), and it contends that competence deals with dynamic efficiency, where dynamic efficiency is essentially about learning and innovation (Hodgson, 1998). On top of that, the governance theory of the firm has been called an "act of faith" (Simon, 1997), implying that it is remiss in dealing with the structure and complexity of real world organizations.

Responding to such criticisms, Williamson (1999) admits that there is a need to go beyond generic governance to address strategy issues faced by rent-seeking firms, to include learning with which transaction cost economics makes only limited contact, and to see adaptation and achieving dynamic efficiency as the central problems of economic organization. Nevertheless, Williamson replies, saying that is much easier than doing it. He asserts that the competence perspective suffers from obscure and often tautological definitions of key terms, and from failures of operationalization. "There being no apparatus by which to advise firms on how to reconfigure their core competences, the argument relies on ex post rationalization: show me a success story and I will show you (uncover) a core competence" (ibid.: 1093). In the end, however, he concludes that the considerations made in the competence perspective are unarguably important and should be incorporated into an enriched theory of economic organization that goes beyond ex post rationalization by advancing predictions and confronting the data.

The objective of this chapter is to take tentative steps towards a predictive learning-based theory of the firm that advances a separate and empirically relevant answer to the question: why do firms exist? Building on, in particular, transaction cost economics, knowledge-based views of the firm, and social

constructivism,¹ it is based on two premises that differentiate it from alternative theories of the firm. The first premise is that learning, defined as the construction of new meanings to guide actions (Berger and Luckmann, 1967; Dixon, 1997), fundamentally differs from other economic activities due to the stickiness of knowledge and the limited controllability of learning. Every organization needs to share meanings, for the knowledge to run a business can never be collected by a single mind (Hayek, 1945). However, the stickiness of knowledge implies that the outcomes of meaning sharing are highly uncertain, because commonality of meaning cannot be guaranteed. Moreover, the controllability of learning is limited in that it results from an interplay between organization and self-organization, and from the interaction among local, experiential knowledge developed in firms and more disembodied, global knowledge embedded in wider scientific and non-scientific “economies of meaning” (Wenger, 1998). Consequently, modesty is required as to the possibilities of organizing learning. That is, firms can only indirectly affect the production of individual and collective meaning by facilitating information exchange supportive of learning and by providing an institutional context in which the potential value of learning can be realized. Most theories of the firm ignore these idiosyncratic attributes of learning. They either confuse information with knowledge or the ownership of information assets with the construction of meaning. As a result, they overestimate the manageability of learning.

The second premise in this chapter is that a learning-based theory of the firm needs to integrate the exchange and production aspects of organizing learning and the associated learning capabilities. It should combine both aspects as learning involves the exchange of information and the production of individual and collective meaning. Such an integrative approach, however, is not common in economic theory. By taking the transaction as the basic unit of analysis, transaction cost economics reflects the neoclassical preoccupation with exchange as the predominant economic activity (Williamson, 1985; Grant, 2001). It essentially ignores how resources, resource combinations, and (core) capabilities can best be deployed and developed to create and realize value. By contrast, most knowledge-based theorists present the firm as a dynamic, knowledge-bearing institution that enjoys the unique advantage of being able to organize economic activity in ways that markets simply cannot (among others, Foss, 1996a; Spender, 1996; Ghoshal and Moran, 1996; Hodgson, 1998). That is, they assert that the production activities of the firm, including those related to learning, cannot be understood from the logic of markets. Knowledge-based theories of the firm thus focus on the production aspects of organizing economic activity, and tend to undervalue the relations between exchange and economic development (Madhok, 2002).

The point is, however, that knowledge and learning capabilities are not only difficult to assemble by means of market exchange, but also difficult to fully obtain through firm organization, in particular in dynamic, complex, and uncertain environments. From a learning perspective, therefore, both markets and firms are needed. Markets exist, because they embody an enormous variety of organizational forms and sizes offering plentiful contexts facilitating all kinds of learning, which helps in discovering and

evaluating new ways of creating and realizing value in manners that single firms cannot. On the other hand, firms exist, because they act as formative beacons on these markets guiding the imagination and creativity of their members, and provide institutional contexts for realizing the potential value of their ideas and understandings in ways that markets cannot. They are the institutions in which the global knowledge embedded in economies of meaning can be efficiently combined with the firm's local knowledge, and in which the planned and emergent learning structures can productively interact, to economize on individual and collective learning.

Subsequently, this chapter attempts to operationalize the abovementioned learning-based view of the firm through development of predictive theory. Sometimes learning across the market will be preferred, while in other situations the firm will enjoy the advantage. A predictive theory of the firm needs to unfold these differences between both modes of organization. As in transaction cost economics, therefore, the strategy for deriving propositions is comparative institutional analysis. Given a choice between the market and the firm, which is better? The above discussion, however, suggests that transaction cost economics' bilateral alignment between transactions and governance structures be extended to a triangular alignment among the attributes of learning, the attributes of information exchange, and the attributes of the alternative modes of organization. The discriminating alignment hypothesis is that learning economies will be achieved when these attributes are properly attuned to each other. On this basis, several propositions are advanced identifying the factors responsible for market or firm advantage. Finally, the steps taken in this chapter toward a learning-based theory of the firm are captured in three implications for economic theory and for a wider theory of performance differences between firms, which is a major concern in both strategic management and resource-based theory. Some consequences of these implications are highlighted, indicating the future research agenda.

Learning and Economics

Learning is defined as the construction of new meanings to guide actions (Berger and Luckmann, 1967; Dixon, 1997) or as changes in the range of potential behavior (Huber, 1991; Anderson, 1995), and knowledge refers to the relatively permanent record of the experience underlying learning (Anderson, 1995). Before addressing the implications of these definitions for economic organization, this section explores the relations between learning, knowledge, the use of resources, and economic growth. In economic terms, knowledge is whatever enables economic actors – be it societies, firms or individuals – to choose among the alternative ways of deploying and developing resources, while learning is a competence² deeply affecting an actor's economic development, which is regarded as an iterative process of creating and realizing value through resource combinations and exchanges.

Resources and Capabilities

Economic growth is a process that involves the use of resources (Moran and Ghoshal, 1999). Resources – defined as bundles of potential services (Penrose, 1959) – are scarce and should therefore be used as efficiently as possible. The more firms succeed in doing that, the higher their productivity. On their own, however, few resources are productive. Living in a world characterized by labor division and specialization, productive activity requires that heterogeneous, tangible and intangible resources are combined and coordinated to transform them into higher-value services. Most resources, however, can be used in different ways and for different purposes, and can provide a variety of different services. That presents an economic problem, which is “... a problem of choosing efficiently among alternative ways to use resources, whether the resources are dollars, a bowl of whipped cream, available time, or even a reputation for honesty and skill” (Stigler, 1988: 193). Consequently, the value-adding processes of a firm and its services depend on how resources and resource combinations are viewed, which is a function of the knowledge applied or the meanings attached to them (Tsoukas, 1996). That is, resources and, in particular, the more composite resource combinations are not “ready made” in that they do not inherently contain productive services that only have to be extracted. Rather, they are what people perceive them to be as they are constructed and reconstructed in individual thought or in the collective interactive processes of practically situated conversation. Such perceptions emerge and change in learning processes with people actively making sense of what they hear, see, do or otherwise experience, reflecting on what they have achieved, and working out appropriate adaptations. The more firm members learn about the different ways and purposes of coordinating and leveraging resources, the more they will be capable of finding value-adding answers to the economic problem of putting resources to efficient use, and the greater the potential productivity of any given set of resources and the attendant prospects of successful action will be (Penrose, 1959; Mahoney and Pandian, 1992).

Resource-based theorists expand the logic of combining resources by suggesting that the potential value of the resources can be leveraged even more when they are integrated into competences and core competences (Amit and Schoemaker, 1993; Grant, 1999a). Resources are seen as the source of competences and core competences as the source of a firm’s competitive advantage and rent generating potential. Competences are defined as “... the capabilities of an enterprise to organize, manage, coordinate, or govern sets of activities” (Dosi and Teece, 1998: 284), and core competences as “... the sets of activities that a firm can organize and coordinate better than other firms.” Moreover, a core competence needs to be understood “... as a reflection of distinctive organizational capabilities to coordinate and learn” (ibid.). Just like any resource combination, (core) competences are constructions depending on the knowledge applied to them.

Economic growth, however, not only requires that heterogeneous resources and knowledge are combined, but also that some of the resulting potential is realized.³ Value has to be created and realized

(Moran and Ghoshal, 1999). Value creation implies enhancing the firm's "productive possibility," which involves exploring new resource combinations. Value realization, on the other hand, means exploiting the firm's "productive opportunity," which occurs when the firm members not only see the resources' productive possibilities, but are also willing and able to act upon them (Penrose, 1959). As a result, not all potentially value-adding combinations that would be productive are realizable. Firm members, for instance, cannot access the requisite resources, do not see how they can profit from them, or otherwise lack the opportunity to make the combination. In every firm at any given time, therefore, a gap exists between its productive possibility and its productive opportunity. Harmonizing both sides, that is dynamically balancing value creation and realization to maximize rents over time, can be seen as the essence of strategy (Boisot, 1999; Grant, 1999a).

Exchange

In addition to combining resources, exchanging them is a well-known source of economic development (Douma and Schreuder, 1991). In this regard, exchange plays two roles.⁴ In its role of enabling the continual reallocation of resources to more productive uses, exchange is a principal mechanism through which most of the resources' potential value becomes realized. Through exchange, resources are put within the reach of those who can press them into services. As such, it narrows the firm's productive possibility-opportunity gap. However, in its second role, exchange widens this gap as it rearranges the firm's set of resources, which can stimulate the perception of new combinations between these resources. In a Schumpeterian sense, new combinations can intendedly or unintendedly lead to the creation of more productive services or more efficient ways of creating services, that is to learning and innovation resulting in new sources of potential value. The first role of exchange is referred to as "allocative efficiency," and the second role as "adaptive" or "dynamic efficiency" (Moran and Ghoshal, 1999; Williamson, 1999). Learning about using resources efficiently thus includes understanding how exchange can affect the firm's productive possibility-opportunity gap, and, in that way, the dynamic balance between value creation and realization.

In summary, economic growth is an iterative process of creating and realizing value through resource combinations and exchanges. Learning is an intermediating competence deeply affecting this growth process, for it implies that firm members reflect on their capabilities to access, combine, exchange, and develop resources, and take appropriate adaptive actions. It is an intermediating competence because it is not a goal in itself, but a means to increase the firm's earnings through greater productivity. This perspective suggests that it is not resources per se, but the capabilities to use resources and to continually improve these capabilities through learning that are central to economic growth and adaptation. It also indicates the interdependences between the production and exchange aspects of organizing economic activity.

Attributes of Learning

The social constructivist theory of learning stresses the act of making meaning and the importance of the socio-cultural context (Dixon, 1997; Wenger, 1998). These characteristics distinguish learning from other economic activities. Two fundamental differences need clarification: the stickiness of knowledge and the limited controllability of learning.

The Stickiness of Knowledge

The larger part of the knowledge used by firms is tacit or “sticky,” which cannot be moved or bought like physical products or commodities (Polanyi, 1983; Jussawalla and Braunstein, 1993; Spender, 1996; Grant, 2001). As a result, the marginal cost of sharing knowledge is high (Szulanski, 1996). Nevertheless, sharing knowledge is needed, because the knowledge to run a business can never be collected by a single mind (Hayek, 1945). As differentiated and spread throughout the entire firm it may be, it needs to be combined to generate products and services, and invent new ones. Integrating this dispersed and multidisciplinary knowledge, however, requires an ongoing process of mutual perspective taking to construct a shared system of meaning (Tenkasi and Boland, 1996) or uniform understandings across the firm members of possibly different interpretations (Huber, 1991).

Obviously, there is considerable potential value in individuals having innovative ideas, the basis of all knowledge production. These ideas, however, create value that has yet to be realized. Firm members have to appreciate the novel productive possibility, and must be willing and able to collectively act upon it. That is, new ideas create or enlarge “a surplus of meaning” (Ang, 1996), implying that the firm becomes richer in meaning production than it is currently able to master.

Hence, new ideas need to be communicated to others in ways that they can be understood, agreed upon, and accepted to realize their potential value. This does not mean that each firm member has to learn what every other member knows, but rather that divergent meanings, which always exist, must be coordinated into a collective learning process. Learning to deploy and develop resources efficiently is thus not only an individual, cognitive process, but also a social process of collective meaning production, exchange, and negotiation.

However, the outcome of collective learning is fundamentally uncertain, because commonality of meaning can never be taken for granted. No one can guarantee that the information exchanges and communication efforts essential for collective learning will result in common meanings and no one can predict what those meanings will be. Varying degrees of divergence between intended and generated meanings may arise due to a number of factors. Amongst others, people appropriate information in ways that suit the practices in which they engage and interpret it subjectively (Putnam, 1983; Weick, 1995;

Choo, 1998); their absorptive capacities are finite (Stiglitz, 1985; Cohen and Levinthal, 1990); they bring various competences, attitudes, intentions, expectations, and emotions to communicative situations (Fiske, 1991); the meaning they attach to themselves, their experiences, and their tasks is context-sensitive (Choo, 1998; Wenger, 1998); the quality of human relationships interferes with information interpretation featuring issues of trust, loyalty, opportunism, and power (Williamson, 1985; Ciborra, 1993; Simon, 1997); the medium can affect the form and content of a message (Trevino et al., 1990); yes, even how people are dressed can be important (Fiske, 1991). All these factors can be barriers to meaning and knowledge sharing. Consequently, not success, but failure to learn should be considered “normal” in a learning-based theory of the firm. It is the “...commonality of meaning, not its absence, which needs to be accounted for” (Ang, 1996: 167).

Understanding organizational learning thus requires a sound grasp of how learners collectively construct meaning as a basis for coordinated action and decision making. This consequence of social constructivism can help explain why learning frequently strikes economists as an enigma. Without the need to generate meaning, learning would be effortless and accurate, as is for instance assumed in neoclassical economics. In that case, however, learning could never offer rent opportunities; it would provide no economic relevance whatsoever. Neither is knowledge a public good, as is often suggested (Fuller, 2002). Being a public good implies that once the knowledge has been produced, there is no marginal cost in diffusing it widely. However, while information assets – for instance digitalized books – may be infinitely reproducible and distributable at low cost, the stickiness of knowledge indicates that the construction of meaning itself does not come cheap. It always takes time, experience, and mental efforts to turn information into meaningful knowledge (Sveiby, 1997). The economic value of learning therefore resides in the capabilities of firms to arrive at individual and, in particular, collective meanings to guide actions as to the most productive ways of creating and realizing value.

The Limited Controllability of Learning

Another difference between learning and other economic activities relates to the limited controllability of meaning production. Learning flags constraints to management and organizational design because of two factors: self-organization and the wider “economies of meaning” – that is, the socially, culturally, historically, and politically situated contexts in which people’s knowledge is embedded (Wenger, 1998). Self-organizing people actively search for information to maintain their competences and create meaning for themselves, mediated or unmediated by the firm. They roam the information transaction space that represents the set of all possible information exchanges available to any actor at any given moment in time (Huizing and Bouman, 2002). In a quest for identity (Wenger, 1988) and economy (Boisot, 1998; Nahapiet and Ghoshal, 1998), they participate in all kinds of social practices constituting distinct communities, both formal and informal, within and outside their firms. Self-organization, therefore,

implies that learners are hard to domesticate, shape their own learning structures, cross organizational boundaries as they see fit, and generate their own meanings. Evidently, this emergent and borderless behavior of learners can lead or contribute to a surplus of meaning in firms.

On the other hand, people's autonomy is always relative as learning is embedded in broader scientific and non-scientific economies of meaning. Always and everywhere, different meanings are dynamically produced worldwide and compete for acceptance. Hence, what is considered knowledge is dependent not only on personal competences and experiences in local practices, but also on how people orient themselves to wider conceptual frameworks. That is, experiential, local knowledge and more disembodied, global knowledge interact as people learn. A learning-based theory of the firm should allow for this epistemological pluralism (Boisot, 1998; Fuller, 2002).

Learning resulting from interactions between locally produced meanings, self-organization, and wider economies of meaning implies that it is resistant to management in the traditional sense of planning, control, and hierarchy (Arthur, 1996; Spender, 1999). "It cannot be designed; it can only be designed for – that is, facilitated or frustrated" (Wenger, 1998: 230). Most theories of the firm confuse information with knowledge or the ownership of information assets such as digitalized books with the construction of meaning. As a result, they are overly optimistic about the manageability of learning. Even intellectual property rights via patents, copyright, and trademarks do not confer overall power to control information, let alone to the meanings attached to this information. More generally, knowledge evokes issues of ownership, valuation and appropriation. Treating it as an alienable commodity or as a resource tradable like any resource is therefore troublesome.

Organizing Learning

Yet, there is a need for designs that provide institutional support for learning. According to Ashby's law of requisite variety (1956), the complexity and speed of a firm's response need to increase with the complexity and speed of change in the environment. Greater variety in the environment necessitates the processing of more information in shorter periods of time. When firm members succeed in doing that, a surplus of meaning emerges that enhances the fundamental uncertainty of achieving commonality of meaning as more ideas will compete for acceptance. The challenge of organizing learning is not to get rid of the meaning surplus reducing this uncertainty, but to create it and simultaneously realize its potential value by seeing it as the engine that can drive the firm towards a higher level of complexity and speed. Adaptive firms need uncertainty as a built-in feature to be able to change to more varied kinds of order. For that, firm members – employees and managers alike – have to be more sophisticated and skilled in their individual and collective meaning making capabilities. They have to learn, and they have to learn how to improve their learning.

Put otherwise, both employees and managers develop three learning capabilities (see table 1). Employees individually produce specialized knowledge and share this knowledge within their work practices as they learn. Moreover, they generate regulatory knowledge relating to their individual and collective learning processes as they learn to learn. Likewise, managers produce and share governance knowledge relating to the running of a business and combining the dispersed and multidisciplinary knowledge of the employees with the firm's resources (learning), as well as regulatory knowledge relating to their own learning processes (learning to learn). Employees and management, therefore, are specialized bodies of knowledge in themselves, situated in firm practices and embedded in wider economies of meaning.

Three learning capabilities	Firm members	
	Employees	Management
Individual learning	Production of specialized knowledge	Production of governance knowledge
Collective learning	Sharing of specialized knowledge	Sharing of governance knowledge
Learning to learn	Regulatory knowledge relating to the individual and collective learning processes of employees	Regulatory knowledge relating to the individual and collective learning processes of management

Table 1. Six kinds of learning processes

Firms considering organization for learning should aim for more efficient organizational design (Wenger, 1998), advancing all six kinds of learning. That is, organizing learning serves to economize on the production and convergence of meaning within the context of the firm. Learning economies are achieved when fewer resources are needed to create a similar output in terms of individual and collective meaning or when superior learning results from using the same resources. As mentioned previously, learning is not a goal in itself, but, ultimately, a means to increase the firm's earnings through greater productivity.

However, the stickiness of knowledge and the limited controllability of learning require modesty on behalf of the organizational designer. Due to these idiosyncratic attributes of learning, firms can only indirectly affect the construction and convergence of meaning. They can (1) facilitate information exchange supportive of learning, and they can (2) provide a receptive context that helps to scope, direct, and motivate the nature and content of learning. In other words, access to information through efficient communication channels is as important in supporting learning as are institutional contexts where the potential value of learning can be realized. Whether some or all of this potential value will be appropriated is not just dependent on the designs that are created in the service of learning, but also on how firm members respond to these imposed structures. Designing for learning does not cause meaning production; at best, it evokes learning. It is this interaction between the planned and the emergent that

determines the actual degree of learning and the efficiency with which it takes place. Below, both information exchange supportive of learning and firms as institutional contexts facilitating the production and convergence of meaning are addressed. Central to this discussion is the development of a learning failures framework, which illustrates the problems of economic organization connected to adaptation and learning.

The Information Transaction Space

Although different in many respects, all learning theories view the availability of information as a necessary, albeit insufficient condition for learning. Faced with ambiguous problems, challenges, uncertainties or even indeterminate feelings that action is needed, learners actively gather information and learn their way into the future. They constantly exchange information to increase their understanding of how to create and realize value in an ever-changing environment. Information exchange performs the same dual role as exchange in general. In an allocative sense, it enables the continual reallocation of information to other and potentially more productive uses; in a dynamic sense, it can help in better accessing, deploying, and developing existing information and knowledge as to the most productive ways of using resources and resource combinations. These resource combinations include (core) capabilities, which "...are based on developing, carrying, and exchanging information through the firm's human capital" (Amit and Schoemaker, 1993: 35).

Ideally, all possible information exchanges that could be expected to assist value creation and realization should take place. The more information within an economic actor's reach, the more productive possibilities and opportunities of resources and resource combinations will be perceived. To fully benefit from these possibilities and opportunities, a vast network of information exchange is needed, as unfettered as possible. Without the free flow of information, learning will be limited (Dixon, 1997). We have called this network representing the set of all possible information exchanges available to any actor at any point in time "the information transaction space" (Huizing and Bouman, 2002). It can be seen as a market where independent and autonomous actors exchange information on an arm's length basis (Milgrom and Roberts, 1992).⁵ Sometimes information is exchanged at a price, often it is transacted freely. Free exchange, however, does not imply that the market mechanism is not at work as it can also entail the exchange of intangible factors such as favors, reputation, and affection (Douma and Schreuder, 1991; Davenport and Prusak, 1998). This view on human behavior does not intend to exclude altruism. However, when building a learning-based theory of the firm it is important to realize that people rarely give away valuable information unremittingly without expecting something in return.

Three Behavioral Assumptions

In the real world, however, only a fraction of all possible information exchanges will ever be made. As any market, the information transaction space does not function perfectly causing exchange inefficiencies. Two human features explaining these imperfections are widely accepted in received theory: bounded rationality and opportunism. Bounded rationality means that a human's capacity to formulate and solve complex problems is limited (Simon, 1976). As a result, people tend to aspire to what is acceptable rather than what is optimal. Opportunism implies that people can strategically manipulate information or misrepresent their intentions, just to take advantage of particular situations (Williamson, 1975). Both human features prevent information from flowing freely and, in this way, limit people's learning capabilities and the efficiency of learning. Bounded rationality restricts people's capabilities to seek, evaluate, comprehend, store, and retrieve all information surrounding them, and opportunism relates to people's willingness to share the information germane to all.

Free and open information exchange, however, is constrained not only by bounded rationality and opportunism, but also by communication limits impeding meaning production and convergence. As mentioned previously, information exchange not necessarily includes the sharing of meaning. Meaning is not solely created by the information provider, which is then conveyed to the information receivers who will uncritically absorb it. Rather, information receivers are relatively autonomous in constructing meaningful representations. They assimilate new information to pre-existing notions and social contexts, which allow them to organize their experiential world. Consequently, the meaning intended by the information provider does not have to correspond to the meaning generated by the information receiver. Social constructivism points to differences in cognitive and social frames of reference as a main cause for such miscommunications.⁶ That is, miscommunications can occur because parties to an information exchange actively engage in the production of meaning in a different "ritual order" (Ang, 1996). In these cases, information is neither misinterpreted nor misunderstood; it is just processed in another logic.

In addition, the difficulties people face in representing what they know, mean, and intend can limit communication. Knowledge or a lack thereof must be represented in some fashion to be used, told, or thought (Newell, 1990). However, people may experience shortcomings in their abilities to unambiguously express themselves in language, images, demonstrations or other means of communication.⁷ For information seekers, for instance, framing and articulating information needs can be a difficult search process in itself. In particular during this process, they are prone to misinterpretations and misunderstandings. Similar to the differences in cognitive and social structures mentioned above, representation difficulties leave ample room for miscommunications and divergent meanings.

It is not that both kinds of communication limits are troublesome in all circumstances at all times. Miscommunications can also stir people's imagination and creativity, and can lead to new ideas, insights,

and understandings offering potential value. Nevertheless, to the extent that value realization requires mutual perspective taking to construct a shared system of meaning, they can hinder individual and collective learning and thus present a problem of economic organization.

The communication limits described – differences in cognitive and social structures, and representation difficulties – extend the human features that explain why the information transaction space is an imperfect market. They have explanatory power of their own in that miscommunications can occur even if conditions of bounded rationality and opportunism do not obtain. That is, commonality of meaning is not secured even when all communicating actors have identical and complete information, a problem that is compounded if information disparities do exist. The behavioral and transaction cost theories of the firm do not make provision for the differences between information and meaning. They are focused on information asymmetry, which is defined in terms of information unevenly distributed among the exchange parties, and the costs to achieve information parity (Williamson, 1975). Placed in a learning perspective, however, bounded rationality, opportunism, and communication limits are jointly responsible for conditions of information and, in particular, meaning asymmetry. Meaning asymmetry refers to situations in which multiple interpretations and opinions of actors co-exist. Such a surplus of meaning can lead to confusion, conflicts, inertia, political behavior or higher management interventions if the joint actors do not succeed in coordinating it into a collective learning process. Therefore, meaning asymmetry curtailing the adaptive capabilities of economic actors is seen as a core problem of economic organization in general and of organizing for learning in particular.

The Learning Failures Framework

The problems of economic organization posed by bounded rationality, opportunism, and communication limits are put in sharper focus if they are coupled with environmental factors. As can be seen from figure 1, bounded rationality is mainly associated with environmental uncertainty, opportunism with a small-numbers condition, and communication limits with both environmental factors. This framework is meant to apply to market and firm organization alike, implying that the human and environmental factors impeding information exchange across markets are similar to those limiting information exchange within firms.

Communication limits are interesting only to the extent that these limits are reached, which happens when the environment is sufficiently dynamic or complex, and thus uncertain. Given a simple and stable environment, there would be much less room for interpretation differences to emerge and, when they do, ample time and opportunities to realize their potential value. As the communication limits are exceeded, however, the economic actors' adaptive and learning capabilities are constrained, both in the sense of being able to recognize, appreciate, and coordinate divergences in interpretation, and of finding the

appropriate representations and communication means to negotiate collective meaning. The same reasoning applies to bounded rationality. A sufficiently dynamic and complex environment implies that the actors' information receiving and processing capabilities are reached, which contributes to a condition of information and meaning asymmetry. There can be so many environmental uncertainties, for example, that they cannot all be considered. These problems are compounded if people are known to vary in their rationality and their communication skills.

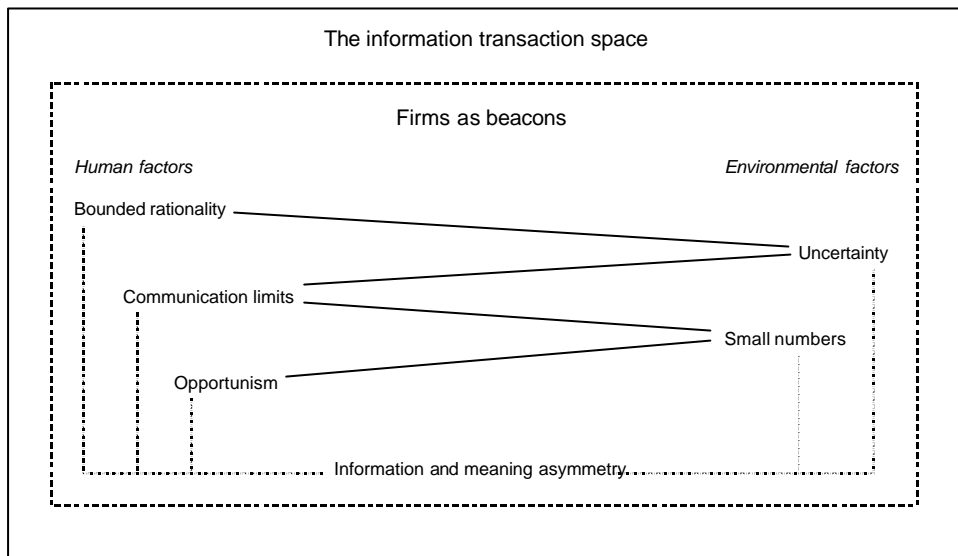


Figure 1. The learning failures framework

As to the pairings of communication limits and opportunism with a small-numbers condition, an organization dilemma occurs. Allegedly, collective learning is best done in small groups sustaining close relationships of mutual engagement based on trust, dialogue, and free information exchange, in particular if it involves double-loop or generative forms of learning (Argyris and Schön, 1978; Fiol and Lyles, 1985; Senge, 1990). Communication limits are quickly reached when group size increases, because that is when meaning sharing and representation difficulties progressively build-up. However, small groups valuing the continuity of the internal relationships are more susceptible to opportunistic behavior than larger groups in which the identity of members is less important (Williamson, 1975). In the information transaction space, for instance, competition among large numbers of information providers renders opportunistic proclivities relatively ineffective. If dissatisfied in whatever way, information seekers can turn to alternative exchange parties, immediately or at a later stage when contracts have to be renewed.⁸ The dilemma is that small groups may be needed in collective learning respects, but that it is in the interest of all or some of its members to seek terms most favorable to them, which can promote opportunistic representations, haggling, and strategic behavior in the construction and sharing of meaning. It thus involves a trade-off between the intensity of learning, group size, and the hazards of

strategic behavior, which is further complicated by the difficulty of telling *ex ante* who is inclined to behave opportunistically and who is not. This trade-off explains why trust attracts so much attention in the learning literature (Senge, 1990; Adler, 2002; Nonaka, 2002). Establishing institutional and personal trust relations is one important way to economize on learning. They can reduce not only the amount of time and investment required to gather information, but also perceived uncertainties about the quality and reliability of the information and its sources (Huizing and Bouman, 2002). As lubricants of any social structure, therefore, trust relations can be extremely efficient.⁹ Opportunistic behavior, however, can destroy them “in a second.”

In addition, another organization dilemma can occur if the limits to communication are paired with the numbers condition. Knowledge and meanings must be surfaced, abstracted, and codified to share them among the firm and appropriate their returns (Boisot, 1998; Zack, 1999; Grant, 2001). However, the significance of the limits to communication will increase as the group of people involved in collective learning becomes larger. The current popularity of knowledge management can be understood in this fashion. The role attributed to this concept is to help overcome and economize on the meaning sharing and representation difficulties in collective meaning construction. If successful, substantial informational economies of scale are achieved, implying that the average costs per information exchange is diminished as the same information is more often exchanged (Huizing and Bouman, 2002). The dilemma is that codifying knowledge may be needed to realize or increase its value, but that such a policy also turns this knowledge into a subject of appropriation by other firms, reducing or eliminating its (competitive) value (Liebeskind, 1996; Zack, 1999). There is another side to this dilemma: if knowledge is not or cannot be made explicit, it is confined to a relatively small group of people, which may constrain its value as well. Potential efficiency gains and informational economies of scale resulting from commodification and “standardization of knowledge” often drive codification of knowledge. However, standardization, while conducive to meaning sharing, is less useful for knowledge creation and heterogeneity in organizational learning as it may induce simplicity and rigidity imposing constraints on information interpretation (Argote, 1999). Consequently, organizing learning here involves a trade-off between the stickiness of knowledge, the number of people that needs to be engaged in developing and deploying this knowledge, the intensity and variety of learning, and the benefits of codifying knowledge. The decisions made regarding this trade-off determine which side of the dilemma prevails.

Learning Failure

In summary, bounded rationality, opportunism, and communication limits can lead to conditions of information and meaning asymmetry. Meaning asymmetry refers to surpluses of meaning that can contribute as well as impede the creation and realization of value, depending on the capabilities of the actors involved to coordinate their differences of understanding in a process of collective learning.

Meaning asymmetry is, therefore, a troublesome source of behavioral uncertainty that necessarily goes with the construction of a meaningful order. Learning failures occur when correspondence in meanings as a basis for coordinated action and decision making is needed, but somehow does not arise. They reflect that communicative practices do not have to arrive at common meanings at all. It can, for instance, be prohibitively complex, time-consuming, or costly to share meanings. If so, the adaptive capacity of economic actors is impaired resulting in a larger productive possibility-opportunity gap and less potential for economic growth than otherwise would be the case.

Information and meaning asymmetry is the derivative condition in the learning failures framework. Whether the problems of economic organization associated with this condition will actually arise depends on the specific constellation of the human features in combination with the environmental factors. The problems would vanish if conditions of unbounded rationality, altruism, unrestricted communication, large numbers, and environmental certainty would prevail. In that case, market-mediated information exchange would be preferred for reasons of allocative and adaptive efficiency, both presently and prospectively. If, however, all of these conditions change, the advantage may shift to firm organization. The significance of this discussion is that learning failures pose interesting comparative institutional choices. Given the attributes of learning, learning structures may be devised that prospectively attenuates the behavioral uncertainties associated with information and meaning asymmetry by assigning information exchanges or related sets of information exchanges to one mode of organization instead of another.

Firms as Beacons in an Ocean of Information

Access to information is but one condition for learning; offering a receptive context for the production of individual and collective meaning is another. Completely on their own, people would probably just stare in the information transaction space, overwhelmed by the possibilities it embodies. As anthropologists tell us, institutions such as a family, a game, or a ceremony overcome individual thought, do a bit of thinking on the behalf of individuals, and fix identities. As systems of interpretation specifying what people should and should not do, they are “organizers of information” (Douglas, 1986) guiding human interaction and information exchange, whether that guidance is intentional or not (Moran and Ghoshal, 1999). The point is that institutions facilitate or economize on meaning production and convergence.

All firms provide an institutional or formative context, which is defined as “the set of preexisting institutional arrangements, cognitive frames and imageries that actors bring and routinely enact in a situation of action” (Ciborra and Lanzara, 1994: 61). The firms’ mission, strategy, structure, routines, rituals, artifacts, and beliefs limit people’s choice sets by indicating what is likely to be seen as viable or productive, and define the implications of their choices. They affect what people try to understand, what

problems they attempt to address, and how they direct their imagination and learning toward the yet unknown and unused productive services of resources and (core) capabilities. Firms can therefore be understood as institutions that carve out an area of their own in the information transaction space and act as subsidiary beacons in this ocean of information (see figure 1). They are not only systems of tradable resources or governance structures regulating contractual relations as, for instance, in transaction cost economics, but also systems of interpretation that help explain why there is not more heterogeneity in meaning production.

The institutional context of firms can be made more supportive of learning by implementing microlevel arrangements. Firms can, for instance, create parallel learning structures "...that exist outside of the formal hierarchy and the role of which are to promote learning and innovation with a view to changing the formal structure in order to improve its effectiveness" (Grant, 2001: 163). Any organizational design promotes deploying and developing certain kinds of knowledge and undervalues other kinds. A functional division of labor, for example, is not attuned to building up knowledge around customers and cross-functional business processes (Hammer and Champy, 1993). Exploring and exploiting such knowledge involves a different type of activity requiring a different coordinating structure. Designating capabilities and core capabilities as subsets of organizational activity so that the future will also have to be organized around them, are typical examples of such parallel structures. As organizational innovations, they create additional fields of identification, exchange, and negotiation that have the purpose and effect of economizing on learning.

Furthermore, firms can support learning by their human relations policy. They can – among others – discuss firm member's capabilities and what personal development is needed or desired, and provide a mix of incentives promoting the participation of firm members in parallel learning structures and increasing trust and open information exchange among them. In addition, they can improve their information infrastructure fostering the learner's process of selecting, organizing, and integrating information, or making experts more easily accessible. That is, both the technology of acquiring, storing, and distributing information and the content of information that flows through these channels can be objects of value.

This discussion illustrates that learning is a multi-layered concept. On the one hand, a large part of a firm's knowledge is developed in specialized form (marketing knowledge, engineering knowledge, and so on). Learners settle into such professional areas of expertise for reasons of efficiency and identity, and individually and collectively build up capabilities and the underlying routines as they learn, and learn to learn (see table 1). The institutional context provided by the firm and its core capabilities as its strategic knowledge domains help shape the scope, direction, and motivation of these learning processes. On the other hand, the firm's context, core capabilities, capabilities, and routines themselves are objects of learning, constituting four layers of learning (Ciborra et al., 1996). Following Penrose (1959), the

governance knowledge and skills to construct and reconstruct these objects and the learning processes perfecting them are often regarded as the firm's management most important function¹⁰ and the principal source of competitive advantage (Spender, 1999). In this view, competitive advantage comes from management knowledge combining the specialized, unique knowledge of the employees with the firm's resources.

Towards a Learning-Based Theory of the Firm

To summarize the argument so far, learning poses interesting problems of economic organization. Considering institutional support for meaning production and sharing is tempting as economic actors adapt to a changing and non-predictable environment through learning and innovation (Dodgson, 1993). That is, learning and innovation shape the behavior of economic actors to the extent that their environments are dynamic, complex and uncertain. However, the possibilities of providing learning support are constrained due to the stickiness of knowledge and the limited controllability of learning. While any organization needs a shared system of meaning for coordinated action and decision making, the stickiness of knowledge implies that the outcomes of collective learning are fundamentally uncertain, because commonality of meaning cannot be secured. Furthermore, learning is difficult to administer, govern, or control, for it results from interactions between locally produced meanings, the wider economies of meaning, the guidance offered by institutions, and self-organization, the complexity of which can obscure the determination of the exact reasons for learning success or failure, even in hindsight. This "causal ambiguity" (Mahoney and Pandian, 1992; Amit and Schoemaker, 1993), which is related to Polanyi's (1983) notion of irreducible uncertainty, demands modesty as to the possibilities of organizing learning. Based on social constructivism, it was subsequently argued that firms can only indirectly affect the production of individual and collective meaning through facilitating information exchange and providing a formative and adaptive context in which the potential value of learning can be realized.

This view on learning implies that a learning-based theory of the firm needs to integrate the exchange and production aspects of organizing learning and the associated learning capabilities. As intuitively appealing as this may sound, such an integrative approach to economic organization is far from common in economics. Transaction cost economics is focused on exchange relations and basically ignores the productive possibilities of resource combinations and (core) capabilities (Williamson, 1985; Grant, 2001), while resource-based and knowledge-based theorists emphasize the production aspects of organizing economic activity at the expense of the exchange aspects (Foss, 1996a; Spender, 1996; Hodgson, 1998). A basic premise in this chapter is that both perspectives are needed if we are to arrive at more comprehensive theories of economic organization and a learning-based theory of the firm (cf.,

Madhok, 2002). Crucial to this assumption is the idea that knowledge and learning capabilities are not only difficult to appropriate by means of market exchange, but that they are also difficult to fully obtain internally, in particular in dynamic, complex, and uncertain environments. More prominence should therefore be given to the interdependence between the exchange of information and the production of meaning and learning capabilities.

Theories of the firm are conceptualizations and models of organizations explaining and predicting their structure and behavior (Grant, 1996). Development of predictive theory requires operationalization of the key terms used in the foregoing sections (Bacharach, 1989). With the market and the firm as the polar modes of organization, we begin to operationalize such a theory if the following question is addressed: given the idiosyncratic attributes of learning, what are the consequences for learning if information exchanges are assigned to the alternative modes of organization in a discriminating way? Information exchanges differ in their attributes, and modes of organization (or governance structures) differ in their competences and costs to support learning. Consequently, some information exchanges will be better suited to the market and others to internal organization within a firm. That is, sometimes learning across the information transaction space will be preferred, while on other occasions the firm will enjoy the advantage. To determine the factors responsible for a productivity advantage of one mode of organization versus the other, a learning-based theory of the firm needs to unfold these differences among the distinguished modes of organization and needs to discriminately align them with the attributes of information exchange and with the attributes of learning.

As in transaction cost economics, therefore, the strategy for deriving propositions is comparative institutional analysis or discriminating alignment. Given a choice between the information transaction space and the firm, which is better? The above discussion, however, implies that transaction cost economics' two-way alignment among transactions and governance structures be extended to a three-way alignment between the attributes of learning, information exchange, and modes of organization. Accordingly, the principal attributes of information exchanges need to be identified along with the defining adaptive and formative attributes of the alternative modes of organization. Moreover, the distinctive strengths and weaknesses of each generic mode have to be described. In combination with the attributes of learning, which already have been discussed in the previous sections, these descriptions are the basis for the discriminating alignment hypothesis, according to which learning economies can be achieved by attuning the attributes of learning, information exchange, and modes of organization (see figure 2). This hypothesis will allow us to advance several propositions that indicate which alignments are efficient and which are not.

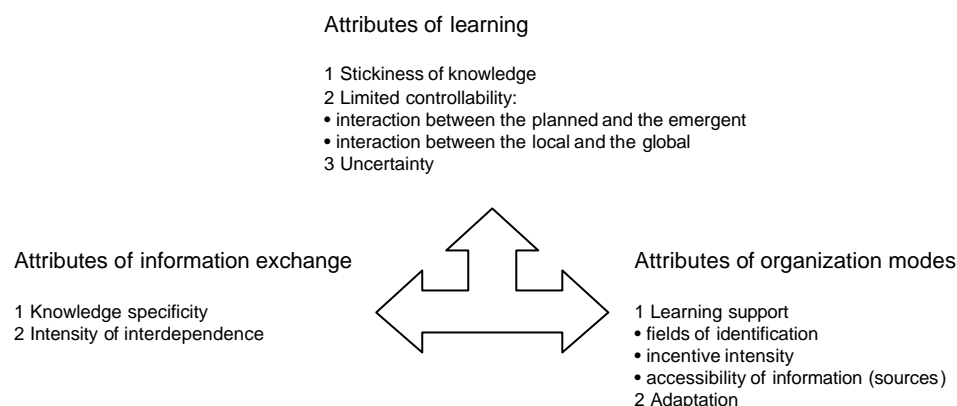


Figure 2 The three-way alignment hypothesis

Attributes of Organization Modes

Markets and firms are alternative modes of organization that differ in discrete structural and formative ways. Both institutions are internally consistent packages of complimentary attributes, implying that each has distinctive strengths and weaknesses (Williamson, 1999). The principal attributes for describing modes of organization and distinguishing alignment differences are:

1. Learning support: in contrast to markets, firms can facilitate learning by providing
 - a. fields of identification, including parallel learning structures
 - b. incentives
 - c. accessibility of information and information sources
2. Adaptation: firms are more apt to effect purposeful, cooperative adaptation, whereas the advantage accrues to markets in supplying spontaneous, autonomous adaptation.

Compared with markets, firms can apply a wide array of organizational arrangements fostering learning. The many microstructure arrangements available can be summarized under three headings. First, firms entail common identification, which motivates to work for firm goals (Kogut and Zander, 1996). By contrast, markets involve exchanges between anonymous and independent economic actors, whose identities are unimportant because new exchange relationships are easily arranged. Second, the identification with firms and colleagues can be increased by replacing the high-powered, net receipts incentives of markets with a mix of low-powered incentives enhancing relations of mutual adaptation and trust among firm members (Williamson, 1975). Third, firms can help their members find their way in the information transaction space in manners that markets do not. Moreover, due to these differences in learning support, firms and markets have differing capacities in effecting cooperative and autonomous adaptation to unforeseen environmental changes.

The relative advantages of firms and markets are based on these attributes of organization modes. They all relate to the problems of economic organization identified in the learning failures framework (see figure 1). By providing fields of identification orienting the practices and identities of the actors involved, firm organization advances the emergence of a common language, common knowledge, and convergent expectations, which creates superior conditions for overcoming meaning asymmetry and developing learning capabilities, and reduces the volume of communication and coordination needed in these respects. In this way, firms economize greatly on bounded rationality and the limits to communication, and diminish the environmental uncertainties resulting from interdependent actors making independent decisions with regard to the ever-changing environment. On top of that, creating fields of identification attenuates the propensities to behave opportunistically, which particularly play a role in small groups depending on the quality of their internal relationships. Likewise, a complementary incentive policy and information infrastructure can facilitate learning and the development of learning capabilities. Another prospective advantage of firms over markets is that they can protect their knowledge from appropriation by their competitors (Liebeskind, 1996), which promotes that investments in generative learning and innovation by relatively small teams are sustained, because, if needed and possible, the knowledge they create can be abstracted to share it across larger parts of the firm to realize its potential value. Finally, firms enjoy the advantage of dealing with environmental uncertainty in that they allow decision making in an adaptive, sequential fashion (Williamson, 1975). Consequently, learning can evolve gradually, which further economizes on bounded rationality and communication limits.

Hence, one way to think about economic organization is to view firms as organizational devices economizing on the production and convergence of meaning. Without the urge to be complete, alternative knowledge-based views of the firm are provided in table 2. Some of these prominent contributions seek complementarities to received theory, in particular to transaction cost economics (Liebeskind, 1996; Foss, 1996a, b, c; Grant, 1999b; Conner and Prahalad, 1996), while others try to depart from them (Kogut and Zander, 1992; Hodgson, 1998; Moran and Ghoshal, 1999). Opportunism is sometimes rejected as a behavioral assumption (Kogut and Zander, 1992; Conner and Prahalad, 1996), whereas bounded rationality is beyond discussion. Nonetheless, they all criticize transaction cost economics for focusing on the exchange aspects of organizing economic activity and obscuring the production aspects.¹¹ Instead, the firm is presented as a dynamic, knowledge-bearing institution that enjoys the unique advantage of being able to organize economic activity in ways that markets simply cannot. That is, it is often argued that the production activities of firms, including those related to learning, cannot be understood by using the logic of markets. In doing so, however, the emphasis in transaction cost economics on exchange as the predominant economic activity is replaced by an equally

one-sided focus on production. As a result, both transaction cost economics and knowledge-based thinking tend to undervalue the interdependence of exchange and production relations (Madhok, 2002).

Knowledge and learning capabilities, however, are difficult to fully obtain through markets as well as through internal organization. Without information from the outside world, the production of individual and collective meaning and of the associated capabilities will be severely limited. Put otherwise, organizing learning within the firm is not all gain as there are circumstances in which the information transaction space is the preferred mode of organization. The relative advantages of markets over firms relate to the added burdens of bureaucracy resulting from organizing learning internally, the potential disincentive properties of firms, and the greater capacity of markets to adapt spontaneously to environmental developments. The ramifications of these prospective advantages are illustrated in the next section, in which information exchanges are aligned with the different modes of organization and the attributes of learning.

	Rationale for the existence of the firm
Penrose (1959)	The firm is a bundle of resources; its economic growth is largely dependent on the coordinating capabilities of its management to make better use of these resources
Grant (1996, 1999b, 2001)	The firm exists because of the superiority of intrafirm relationships in integrating the knowledge of specialized individuals
Spender (1996, 1999)	The firm exists because it can better develop the collective knowledge and skills required to coordinate the resources into a viable bundle
Liebeskind (1996)	The firm is a vehicle of organizing knowledge transactions internally to protect valuable knowledge from appropriation or imitation by its competitors
Kogut and Zander (1992, 1996)	The firm exists because it provides a social community of voluntaristic action structured by organizing principles that are not reducible to individuals
Conner and Prahalad (1996)	The firm is an efficient vehicle for cultivating and offering a shared frame of reference – a stock of organizational knowledge – whereas markets cannot develop and offer a cognitive frame that is equally fine-grained
Foss (1993; 1996a, b, c)	The firm exists because it can more efficiently coordinate interdependent, collective learning processes than market organization is able to
Teece et al. (1997)	The firm exists because it has distinctive capabilities to make better use of their resources that cannot be readily assembled through markets
Hodgson (1998)	The firm exists because it enjoys efficiency advantages in relation to markets because of the relative intensity and longevity of interpersonal relations within the firm and the group and institution-based characteristics of much of the learning and knowledge within that firm
Boisot (1998)	The firm is the locus of interaction between tacit personal knowledge and explicit impersonal knowledge

Zack (1999)	The firm is a vehicle for creating, integrating, storing, and applying knowledge
Moran and Ghoshal (1999)	The firm can be seen as the primary yards where society's resources are gathered, developed, and used to initiate and harness the processes of economic development; firms bridge missing markets

Table 2. Knowledge-based rationales for the existence of the firm

Attributes of Information Exchange

The key attributes for characterizing information exchanges are:

- 1 Knowledge specificity
- 2 Intensity of interdependence

Knowledge specificity refers to the investments undertaken to facilitate the information exchanges that sustain the production of local, context-specific knowledge. Firm members can invest in the development of context-specific and context-generic knowledge. Context-specific knowledge encompasses all the meanings that cannot be redeployed for use in another context without appreciable loss in productive value. As opposed to context-generic knowledge, therefore, it is restricted to specific uses in space and time (Boisot, 1998). Such local, experiential knowledge is developed in firm practices, in which idiosyncratic information is exchanged, requiring “special purpose investments” (Williamson, 1985) on behalf of both the firm and its members. Examples are learning-on-the-job, specialized training, and parallel learning structures. Potential benefits of such customized investments are communication economies, greater cooperative adaptability, and thus improved learning efficiency. There are, however, risks involved. For the firm, the risks are – amongst others – that firm members leave the organization and that it takes time and new investments for newcomers to become good substitutes, while the firm members, for instance, run the risk of developing situated knowledge that cannot be transferred to another employer without incurring a substantial loss of its value. An advantage of firm organization is that it can persuade firm members to run this risk and make the necessary investments by offering the security of an employment contract, personal development opportunities, and a protective context of confidence and trust in which that knowledge is valued and can be further enhanced. Market exchange does not need such persuasion as it entails morally independent and faceless parties meeting for a moment to exchange nonidiosyncratic information. The proposition is that information exchanges will be taken out of the market and organized internally as the degree of knowledge specificity deepens. Furthermore, to the extent that the environment becomes more uncertain, the prospective benefits of firm organization will proportionally increase with the need to support learning.

The intensity of interdependence relates to the degree to which the construction and convergence of meaning entails highly interrelated information exchanges among various parties. Not all information exchanges are given to information and meaning asymmetry to the same degree. The total of complementary interactions necessary for a learner to acquire the knowledge that Amsterdam is the capital city of the Netherlands is much less than that needed to understand Einstein's relativity theory. Therefore, the more tacit, complex, and unfamiliar the information being exchanged and the knowledge it tries to transfer, the larger the set of interdependent information exchanges and the set of the more composite learning processes will be (Foss, 1996a). Likewise, the more information there is and the larger the surplus of meaning, the more productive possibilities there will be; the more parties there are, the greater the likelihood that these possibilities will be productively realized. To fully exploit these possibilities, however, more exchange is needed, which makes it more likely that any exchange will involve interdependent information transactions and learning among several parties (cf., Moran and Ghoshal, 1999). The corresponding proposition is that the firm is needed to coordinate and leverage these interdependences between information exchanges, learning processes, and the parties involved, whereas the coordination of relatively independent information exchange conveying codified knowledge can be left to markets.

However, the above mentioned propositions are not fully satisfactory in that they can only partially explain and predict people's borderless learning behavior and the variety of organizational forms observed in practice supporting this behavior. Learners do not cross the boundaries of their firms just to collect independent information items from anonymous and decentralized parties, as the propositions developed so far implicate. Rather, they also engage in formal and informal "communities of knowing" (Boland and Tenkasi, 1995) embedded in wider economies of meaning, in which the identity of the exchange parties is relevant. The various ways in which these hybrid communities are organized suggest conditions of organizational failure and market advantage. Examples are academic networks, professional communities, special interest groups, Silicon Valley-like personal and institutional networks, training and education facilities, communities of practice, and the many recent "spontaneous emergences of order and structure" (Cilliers, 1998) on the Internet mediating information demand and supply (Huizing and Bouman, 2001). While most infomediaries on the Internet follow the previously mentioned propositions in that they mainly assist in the exchange of nonspecific, independent, and codified information between faceless parties,¹² the other hybrid examples do not seem to fit the predictions. Academic networks, for instance, are presumably as capable of providing learning support in the three dimensions of offering fields of identification, incentives, and access to information and information sources as firms are. Allowing such hybrid modes of organization into the discussion, however, requires an additional conceptualization of the market.

Another View on the Market

So far, the market was conceptualized in ideal terms – that is, as separate individuals on an arm’s length basis whose identity is unimportant for exchange relations to occur. However, the market can also be seen as an abstract representation of firms and other organizations interacting with one another through this market (Milgrom and Roberts, 1992). Then, the decision to internalize or externalize information exchanges is not between an ideal market and one firm, but is between at least two autonomous actors (A and B) and a single firm combining the learning support activities of A and B. As Williamson (1999: 1097) indicates with regard to transactions in general: “That issue is never addressed, much less worked through, in a comparative institutional way.” This issue has become known as “the firm size puzzle” (Williamson, 1985), which admittedly is more concerned with the size and scope of the firm than with explaining its existence (Foss, 1996b). Nevertheless, we will use it to refine our explanation of why firms exist.

With this additional conceptualization of the market, a new, adapted question needs to be posed: given that all modes of organization can be supportive of learning, which modes, under what conditions, are more (or less) competent in deploying their institutional capabilities to support which kinds of information exchanges? That is, how are learning activities distributed among the firm and other forms of organization operating in the information transaction space? Answers can be found in the bureaucratic disabilities of the firm, its disincentive properties, and the advantage accruing to markets in effecting spontaneous adaptation.

Taking information exchanges out of the market and organizing them internally unavoidably adds bureaucratic costs. There is a trade-off involved between the relatively high transactions costs of market exchange on the one hand, and the relatively high production and agency costs of firm organization on the other hand.¹³ It is advantageous for a firm to organize learning internally if the costs of doing so are lower than those within any other organization and lower than those through the ideal market. In other cases, learning across the information transaction space is to be preferred.

Moreover, the advantage of organizing learning may shift to the market when the firm shows significant disincentive properties. Firm members may prefer learning through external organizations or communities if, for instance, the firm’s culture is highly political, individualistic or unappreciative of learning. An additional argument relates to the risks of the special purpose investments supporting the development of local, context-specific knowledge. In some circumstances – for instance, training employees in specific job-related tasks –, the information needs of learners and the outcomes of learning can be specified in advance, which simplifies calculating a return on this investment. In other situations, however, they cannot easily be predefined. In particular if the property rights for knowledge are weak, this uncertainty can induce firms to resort to more general purpose investments driven by informational

economies of scale, such as the implementation of an intranet or a document management system, which leaves the selection and interpretation of the information, and turning it into action, to the self-organizing capabilities of the learners. However, the more a firm relies on general purpose investments to facilitate learning, the more competition it can expect from other organizations offering similar or superior learning support in the information transaction space. Differential learning support capabilities between the firm and the market could therefore help explain success or failure of firm investments in information sharing and learning.

Finally, markets are generally considered to be superior in supplying autonomous adaptation (Williamson, 1975, 1985; Grant, 1996). It is their role of embodying new options and making initiative easier and potentially more rewarding, which makes them such flexible devices for adapting to unanticipated changes (Foss, 1996a; Evans and Wurster, 1997). Firm members presumably engage in communities of knowing and shape their own learning structures to keep abreast of cutting-edge developments in their fields of expertise, to keep track of the latest ideas and insights of the best experts in these fields, and to participate into a congenial group of peers sharing similar interests. If so, they participate into the development of global, context-generic knowledge, which, if molded productively with their knowledge of firm particulars, could result in the detection of innovative productive possibilities for the firm in which they are employed. Therefore, both markets and firms are needed for adaptively efficient economic development (Moran and Ghoshal, 1999). The information transaction space is needed, because it provides an enormous variety of organizational forms and sizes offering plentiful contexts fostering all kinds of learning, which helps in discovering and evaluating new ways of creating and realizing value in manners that individual firms cannot. On the other hand, firms exist, because they are the formative beacons in this information transaction space guiding the imagination and creativity of managers and employees alike, and provide the institutional contexts for realizing the potential value of their new ideas in ways that markets cannot. They are the platforms where the context-generic knowledge of the information transaction space can be efficiently combined with the firm's unique context-specific knowledge, and where the planned can productively interact with the emergent, to economize on individual and collective learning.

Additional Propositions

A proposition is that firm members prefer to learn across the information transaction to develop and deploy their context-generic knowledge, which maintains their own utility or market value as professionals, whereas internal organization is given preference for developing and deploying context-specific knowledge, which sustains their value as employees. This could help explain why, for instance, MBA-programs are usually left to the educational market. It could also account for the increasing

importance of Hofstede's (1991) individualism-collectivism dimension of cultural variability in that firm members and, in particular, knowledge workers no longer offer undivided commitment and loyalty to their employers. Compared with industrial workers, whose knowledge often is connected to a specific physical environment, knowledge workers are much less dependent on their current job as they build professional competences that are closely related to specific economies of meaning outside the firm (Sveiby, 1997).

Another proposition is that avoiding the risks of specific purpose investments in customized learning designs will result in increased competition from the information transaction space.

That is, firm organization gives way to market coordination as the relative degree of learning support needed to keep up with the fluidity of knowledge diminishes. The successful existence of many communities of knowing could fit in this picture. Moreover, insofar as economic growth is increasingly propelled by ideas and learning and less by traditional resources (Drucker, 1983; Tenkasi and Boland, 1996; Quinn et al., 1999), the three learning capabilities of creating a surplus of meaning, achieving commonality of meaning, and learning to learn become more important as potential sources of economic growth, which at least partially explains, for example, national programs promoting the knowledge economy and the ongoing dematerialization of economic activity. Finally, the more dynamic, complex, and uncertain the environment, the more the development and deployment of the three learning capabilities will require that local and global meanings, and that planned and emergent learning structures productively interact to economize on the production and convergence of meaning. Consequently, firms and firm members become more dependent upon the wider economies of meaning, in which they formally or informally participate. The upshot is that a theory of the firm should reflect this epistemological pluralism and the interdependence between organization and self-organization. They are part of the rationale for the existence of firms.

Discussion

As mentioned in the introduction, the objective of this chapter was to take tentative steps towards a learning-based theory of the firm. Extending on, in particular, transaction cost economics, knowledge-based views of the firm, and social constructivism, the steps taken suggest at least three implications for economic theory and for a theory of performance differences between firms, which is a major concern in both resource-based theory and strategic management. This concluding section serves to briefly highlight these implications, each of which indicates important avenues for future research.

Meaning Asymmetry

The first implication relates to the differences between learning and other economic activities that were probed in this chapter. Based on social constructivism, it was explained that these differences bear on the stickiness of knowledge and the limited controllability of learning. Most existing theories of the firm ignore these idiosyncrasies of learning. In the behavioral and transaction cost approaches, the emphasis is on problems of economic organization resulting from conditions of information asymmetry. However, achieving commonality of meaning is not secured even when all parties have identical and complete information. As a result, learning is constrained not only by bounded rationality and opportunism, but also by communication limits – that is, by differences in cognitive and social frames of reference among the communicating parties and by the representation difficulties they may experience in expressing themselves. From a learning perspective, therefore, a logical next move in the development of economic theory would be to add communication limits as the third feature of human behavior, and assume meaning asymmetry, which refers to surpluses of meaning that can generate as well as obstruct economic growth, depending on the capabilities of the actors involved to coordinate their differences of understandings in a process of collective learning. Social constructivism could thus provide the deeper behavioral insights “a richer theory of economic organization awaits” (Williamson, 1985: 392). In this chapter, these deeper behavioral insights were specifically related to organizing learning. A truly richer economic theory, however, would also include the organization of other economic activities. Part of the future research agenda is therefore to explore the relations between meaning asymmetry and economic activity in general: what are the implications of assuming fundamental uncertainty as to achieving commonality of meaning for a comprehensive theory of economic organization? Moreover, in this chapter, the impact of meaning asymmetry on the firm size puzzle has only been scratched. What are the implications for the size and scope of firms?

Production and Exchange

A second implication for economic theory relates to the assertion that a learning-based theory of the firm needs to integrate the exchange and production aspects of organizing learning. It is only recently that attempts are being made to synthesize both aspects into a more comprehensive theory of economic organization (Madhok, 2002), which is also reflected in the definition of economic growth as an iterative process of creating and realizing value through resource combinations and exchanges (Moran and Ghoshal, 1999). As to organizing learning, following an integrative approach to economic organization implies that knowledge and learning capabilities are considered difficult to obtain through market exchange as well as through firm organization. This argument is central to our criticism of most existing knowledge-based theories of the firm (see table 2), which tend to ignore the interaction between learning and the external communities of knowing embedded in economies of meaning in which context-generic

knowledge is constructed. One consequence of this argument is that all modes of organization – markets, firms, and hybrids – are needed for learning and for adaptively efficient economic development. That is, it is implied that the choice of mode is not just a case of choosing between markets or firms or hybrids, as, for instance, transaction cost economics implicates, but increasingly also an issue of comparatively assessing different combinations of modes, which all differ in their costs and competences, and of choosing the most productive one. This latter choice is contingent on the information exchanges and the learning activities to be organized, but it is an area of future research to illuminate the exact conditions under which a particular form of organization should be viewed as a substitute and when as a complement (Cohen and Levinthal, 1990; Huizing and Bouman, 2002). Another consequence is that the two-way alignment of transaction cost economics needs to be replaced with a three-way alignment, implying that economizing results can be achieved by attuning the attributes of learning, of information exchange, and of the distinguished modes of organization. This relatively new approach to economic organization also requires further research. For instance, if employees and managers are mainly engaged in developing and deploying specialized knowledge and governance knowledge respectively, how are they interrelated? Furthermore, what are the interdependences among costs and capabilities (Madhok, 2002)?

Strategy Theory

The third implication of the steps taken in this chapter relates to the correspondence between a theory of the firm and a theory of performance differences between firms in that the factors identified creating a difference in the productivity advantage of a firm over market organization – a theory of the firm – could be a subset of the factors explaining why some firms outperform other firms and other organizations (Conner and Prahalad, 1996). In contrast to transaction cost economics, resource-based and knowledge-based approaches are concerned not only with the question of why firms exist, but also with the strategic management issue of why firms differ or, more specifically, why some firms achieve a competitive advantage and others do not. In this literature, knowledge is increasingly being considered the principal strategic resource, and the ability to create and apply it the core competence for building and sustaining a competitive edge. If so, the learning-based considerations discussed in this chapter could inform strategic management as well as resource-based theories of firm-level strategy. Firms differ in the extent to which they offer learning support and in their adaptive capacity.

They all provide a unique institutional context and, consequently, vary in their capabilities and costs to arrive at individual and collective meanings to guide actions as to the most productive ways of creating and realizing value. As can be seen from figure 2, a more detailed analysis of performance differences would delve into the microlevel arrangements relating to the fields of identification offered, the mix of incentives applied, and the accessibility of information and information sources. Even more details could

be obtained if the analysis would also include the different learning processes of employees and managers (see table 1), and the institutional context, the core capabilities, the capabilities, and the routines as the four layers of learning. The resource-based tests of value, durability, appropriability, limited substitutability, and inimitability (Barney, 1991; Amit and Schoemaker, 1993) can be used to shed light on the specific resource combinations and capabilities that are or could be the sources of competitive advantage.

Although learning is generally associated more with value creation than with value realization, it involves creating new sources of competitive advantage as well as exploiting current ones. Both are needed for an effective firm strategy (Boisot, 1999) and for allocatively and, in particular, adaptively efficient economic development. However, as Moran and Ghoshal (1999) point out, the knowledge about how to reconcile the creation and sustenance of competitive value is still limited. Our argument suggests that headway on this matter awaits deeper insights into the interrelations between the firm's knowledge and the wider economies of meaning in which it is embedded, and into the interdependences among organization and self-organization. Increasingly, the challenge of organizing learning is to recognize the growing importance of the emergent learning structures shaped by the firm's members, within and outside their firms, and to productively combine these structures with everyday business by seeing them as the engines that can drive the firm's economic development.

Notes

1. While this is not the place to delve into much detail, there are many kinds of learning theories (Anderson, 1995; Wenger, 1998). Each learning theory focuses on different aspects of learning and is therefore useful for different purposes. The purpose of using social constructivism as a basis for this chapter is to explore particular learning aspects that are often ignored in the existing theories of the firm, but nevertheless seem highly relevant to economic organization: the capabilities of learners to mentally construct meaning of their own environment through active participation in socially, culturally, historically, and politically situated contexts, and to shape their own learning. This choice does not have the intention to exclude other learning theories in the development of a learning-based theory of the firm, nor to state that other learning theories are incompatible with social constructivism.
2. In this chapter, the notions of capability and competence are used interchangeably.
3. Moreover, this value realization has to exceed the costs of withdrawing resources from the productive uses they have served so far. Exploiting new sources of value implies some certain loss in currently realizable value and some less certain gain in potential value (Moran and Ghoshal, 1999).
4. Resources are exchanged whenever the right to use it is transferred.
5. This conceptualization of the information market resembles the perfect model of neoclassical orthodoxy in many respects, but relaxes the assumption of perfect information and does not see prices as sufficient statistics.

6. In social constructivism, the assumption of meaning transparency underlying the idea of communication as information transmission is rejected. Communication has therefore more to do with meaning production than with information exchange.
7. In contrast to his later work, Williamson initially included language limits in his definition of bounded rationality, by which he meant "...the inability of individuals to articulate the knowledge or feelings by the use of words, numbers, or graphics in ways which permit them to be understood by others" (1975: 22). However, we see these language limits as part of a broader category of representation difficulties, and prefer to use the notion of bounded rationality as it was originally intended (March and Simon, 1958; Cyert and March, 1963).
8. Williamson (1975) relates bounded rationality constraints and opportunistic behavior to ex ante and ex post contracting difficulties to illustrate the problems of economic organization. While explicit and implicit contracting can also be applied to information exchange, this line of argument is not pursued here.
9. Transaction cost economics has been criticized for excluding trust as a basis for lasting social relations (Douma and Schreuder, 1991; Liebeskind, 1996). However, we do not agree with this criticism and see trust and opportunism as sides of the same coin. Fighting opportunism is to build trust. More generally, as transaction cost economics, the above analysis of the problems of economic organization can be criticized for its unattractive view on human nature. However, there is sound logic in departing from a "worst-case scenario" when developing a learning-based theory of the firm. It is not that all economic actors will behave as indicated at all times. Rather, it is to say that human behavior is fundamentally uncertain and that organizational designers had better consider this ex ante. Moreover, the critics of economic theories seem to be more concerned with organizational arrangements stimulating people in a positive way than with "human nature as we see it." That is, they prefer to emphasize "positive" values such as commitment and trust instead of "negative" ones resulting in control-driven organizational measures such as monitoring and administrative controls.

While we agree with this latest argument, we contend that authors differ more on the normative consequences they attach to their theories than on the assumptions imputed on human behavior.

To return to trust as a typical example: why else is this issue attracting so much attention in the literature?

10. Calling this a management function does not necessarily mean to say that it can only be performed by managers. In other forms of organization, for instance self-managing groups or communities of practice, managers play a less prominent role. However, within firms, the institutional context, (core) capabilities, and routines generally fall under (top) managers' responsibility.
11. Although the relations between transaction costs and production costs have been addressed (Riordan and Williamson, 1985), it can still be said that the comparative institutional choice is mainly determined by a transaction costs assessment (Williamson, 1985).
12. What these infomediaries enabled by Internet technology basically do, is to create more complex and varied economies of meaning by increasing the availability of information.
13. This trade-off is worked out in Huizing and Bouman (2002). Transaction costs are the costs associated with information exchange, such as search, communication, documentation, contracting, and redundancy costs. The production costs involve the costs of information representation and protection costs, whereas the agency costs result from the monitoring and bonding activities needed to ensure that the firm members and the specialized

business functions responsible for the organization of learning act in the interests of the firm's principals. By definition, the production and agency costs add bureaucratic costs.

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