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Real Options and the Theory of the Firm

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I. Introduction

It has become an increasingly prevalent conviction, perhaps beginning with Rumelt (1984), that sound theorizing about strategy should be founded in a theory of the firm, and that economic theories of the firm hold certain attractions in this regard. Indeed, within the last decade, contractual theories of economic organization[1] have made a substantial impact in the field of strategic management and are now seen as being among "the most influential theoretical perspectives in strategy research (Zajac 1992: 76).[2] As a result, many issues of strategic management are now conceptualized as problems of efficient governance. It would also seem to be a reasonable conjecture that this impact is unlikely to diminish in importance in the field for some time to come.

However, the influence of the contractual approach has not gone entirely unchallenged. In previous work, I have argued that in the current theoretical landscape of economic organization, two sets of theories constitute the dominant theoretical contenders (Foss 1993, 1997a,c). One is what has here generically been called "contractual theories of economic organization", while the other one may equally generically be called "the capabilities view of the firm".[3] In a nutshell, the former stream views the firm as arising because it efficiently solves incentive conflicts that market organization is not capable of solving (equally efficiently); the latter stream views the firm as existing because it more successfully than markets coordinates and accumulates productive knowledge.

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[1] By "the modern economics of organization" or "organizational economics", I here have in mind a rather broad menu of theories, such as transaction cost economics (Williamson 1985), the incomplete contract approach (Hart 1995), principal/agent theory (Holmström 1982), and the nexus of contracts approach (Alchian and Demsetz 1972).

[2] See the discussion in Mahoney and Pandian (1992) and Seth and Thomas (1994).

[3] In this case, too, a broad menu of theories is involved, including "the evolutionary theory of the firm" (Nelson and Winter 1982), "the competence perspective (Foss 1993), "the capabilities perspective" (Langlois and Robertson 1995), "the dynamic capabilities perspective" (Teece and Pisano 1994), and "the resource-based approach" (Wernerfelt 1984).

Both approaches to the theory of the firm have been presented by various proponents as reaching for what Richard Rumelt (1984) in a classic paper called "a strategic theory of the firm". By that term, I will here understand a theory of the *existence*, *organization*, *boundaries* and *competitive advantage* of the firm. However, it will be argued that in searching for a strategic theory of the firm, we confront two imperfect contenders. To put it briefly, while the economics of organization is of considerable relevance to the strategy field, and while it is characterized by (relative) explanatory elegance and simplicity, it is also likely to misrepresent many strategy issues. On the other hand, while the capabilities perspective is much truer to the traditional interests and concerns of the strategy field (because this is partly where it was originally developed), it is at present much too dispersed and explanatorily unclear to serve as a strategic theory of the firm.

The further argument is that that recent work on real options (Sanchez 1993; Dixit and Pindyck 1994) show promise of helping us to advance the strategic theory of the firm by

- Bringing a dynamic dimension to existing theories of the firm which they lack at present. While contractual approaches do not inquire into issues such as learning and innovation, there is, as many writers have pointed out (e.g., Porter 1994), a distinctively retrospective character to capabilities arguments. Arguably, an options perspective may help remedying these deficiencies.
- Casting new light over the issues of the boundaries and possibly also the existence of firms. Thus, including an options perspective in the theory of the firm is likely to alter traditional ideas on, for example, efficient boundaries: those boundaries of the firm that would be the preferred ones from a static transaction cost minimizing point of view may not be the right ones in a longer run perspective where the creation of options becomes of paramount importance.

Thus, the argument of this paper does not amount to an extension of the theory of real options *per se*. Rather the argument, or, if you like, statement calling for further research, is that there is a potential for cross-fertilization between theorizing on real options and recent theorizing on the theory of the firm, of the capabilities and the contractual variety. Because of space limitations, many of the above points are, unfortunately, communicated in a telegraphic manner, but hopefully the references given may assist in cases where the reasoning is overly compact.

II. Modern Theories of the Firm: Coordinating Incentives vs Coordinating Knowledge

A. The Contractual View of the Firm: Coordinating Incentives, Property Rights, and Commitments

The basic features of the emergence of the modern contractual theory of the are well-known: As the story is normally told, the theory of the firm traces its existence back to Coase's landmark 1937 essay on "The Nature of the Firm". Coase pointed out that in the world of neoclassical price theory, firms have no reason to exist. The reason why firms existed after all, Coase reasoned, must be that there is a "cost to using the price mechanism" (Coase 1937: 390). Thus was born the idea of transaction costs: costs that stand separate from and in addition to ordinary production costs.[4] Much later, Coase (1972: 63) noted that his 1937 essay had been "much cited and little used." However, it is somewhat ironic that precisely at the

[4] In the 1937 article, he lists several sources of those "costs of using the price mechanism" that give rise to the institution of the firm. In part, these are the costs of writing contracts. The "most obvious cost of 'organising' production through the price mechanism is that of discovering what the relevant prices are" (Coase 1937: 390). A second type of cost is that of executing separate contracts for each of the multifold market transactions that would be necessary to coordinate some complex production activity. Firm organization may avoid these costs, and exists for this reason. Including also various costs of internal organization helps explaining, by means of standard marginal reasoning, where the boundaries of the firm is located.

time of Coase's lamentation, serious work on economic organization that rested on distinctly Coasean foundations had actually begun (i.e., Williamson 1971; Alchian and Demsetz 1972). And only a few years later, the theory of the firm field virtually exploded. All this work followed Coase in conceptualizing the firm as a contractual entity whose existence, boundaries and internal organization could be rendered intelligible in terms of economizing with transaction costs.

The present flagbearer of the field, Oliver Williamson has focused in on what has become perhaps the central concept in the present-day economics of organization: asset specificity. The logic is basically simple. Assets are highly specific when they have value within the context of a particular transaction but have relatively little value outside the transaction. This opens the door to opportunism. Once the contract is signed and the assets deployed, one of the parties may threaten to pull out of the arrangement — thereby reducing the value of the specific assets — unless a greater share of the quasi-rents of joint production find their way into the threat-maker's pockets. Fear of such "hold up" *ex post* will affect investment choices *ex ante*. In the absence of appropriate contractual safeguards, the transacting parties may choose less specific — and therefore less specialized and less productive — technology. If, by contrast, the transacting parties were to pool their capital into a single enterprise in whose profits they jointly shared, the incentives for unproductive rent-seeking would be attenuated.

The explanation from asset specificity is at base an argument about the alignment of incentives, even if it ultimately rests on imperfect information: in a world of certainty and unrestricted cognitive ability (if one could imagine such a place), it would be easy to write and enforce long-term contracts that preempt *ex ante* unproductive rent-seeking behavior *ex post* and thus obviate internalization. Indeed, whatever their differences may be, the central heuristic that characterizes all contractual theories of the firm (see footnote 1) is an overriding emphasis on conceptualizing literally *all* problems of economic organization as problems of aligning incentives/efficient governance.

It cannot be denied that in many respects, this research strategy has proven immensely profitable in terms of generating new important insights. But, in the view taken here, it should also be recognized that it misrepresents important phenomena and hinder understanding other phenomena. The problem is certainly not that reformulations of traditional management and strategy issues in terms of optimization and incentives are internally inconsistent. Rather, the issue is whether the mechanisms so identified are in fact *plausible explanations of the phenomena under study,* and that to translate these assumptions into an exclusive and near-universal research strategy arguably closes off a range of plausible alternative explanations of what firms are and what strategic managers do. More generally, one can point to a number of blind spots in the contractual theory of the firm[5], which are arguably caused by its narrow research heuristics:

- It is not recognized that knowledge about how to produce is imperfect (or, if you prefer, dispersed, bounded, sticky and idiosyncratic), that is, differential capabilities are not treated (Foss 1993).
- Relatedly, it is not recognized that knowledge about how to link together one person's (or firm's) productive knowledge with that of another is also imperfect (Richardson 1972; Langlois and Robertson 1995).
- Innovation (except organizational innovation) and organizational learning are suppressed, since the contractual view pays no attention to processes (and products *per se* (only to how these are organized) (Foss 1993).
- Competitive advantage can only be understood in terms of economizing with transaction costs; not in terms of accumulation of scarce, rent-yielding and flexibility and responsiveness to changing market circumstances (Teece, Pisano and Shuen 1997).

[5] Blind, that is, in regard to the requirements that a full-blown strategic theory of the firm (in the sense defined earlier) should meet.

- The benefit aspects may be formally recognized through the stipulation that efficient economic organization maximizes joint surplus, but in practice all attention is concentrated on transaction *costs,* neglecting transaction *benefits*, and missing, in effect, the Chandlerian (Chandler 1990) story of increasing transaction costs in order to lower production costs.

B. The Capabilities View: Coordinating Knowledge

The view of the firm presented in contractual theories has recently been contested by the capabilities view; a body of theorizing that is more conscious of the character and limitations of knowledge than is the mainstream economics of organization. The conceptualization of the firm that underlies this work was perhaps best expressed in the late Edith Penrose's *The Theory of the Growth of the Firm* (1959), one that she explicitly differentiated from the prevailing production-function view. "The firm," Penrose says, "is ... a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision" (Penrose 1959: 24). Although this is often overlooked, her theory is one that stresses entrepreneurship. In Penrose's story, the management team holds *images* of the external environment and of the firm's internal resources (this is the subjectivist part of her analysis). She further argues that these images are produced through internal learning processes, and that they determine the constantly changing "productive opportunity set" of the firm, that is, the productive possibilities that that the firm's "'entrepreneurs' see and can take advantage of" (Penrose 1959: 31). "In the long run", Penrose explains,

> ... the profitability, survival and growth of a firm does not depend so much on the efficiency with which it is able to organize the production of even a widely diversified range of products as it does on the ability of the firm to establish one or more wide and relatively impregnable 'bases' from which it can adapt and extend its operations in an uncertain, changing and competitive world (1959: 137).

Thus, seemingly paradoxically, flexibility is just as much a message of the analysis as specialization is. The paradox vanishes when it is realized that specialization is specialization in terms of the underlying resource-base (rather than products) and that such specialization may be fully consistent with reacting to new business opportunities.

Whereas Penrose explicitly begins from cognition, modern contributions to the capabilities perspectives simply begin from the empirical generalization that productive knowledge is neither explicit nor freely transferable. Either way it boils down to the same common-sense recognition, namely that individuals — and organizations — are necessarily limited in what they know how to do well. Indeed, the main interest of the capabilities view is to understand what is distinctive about firms as unitary, historical organizations of co-operating individuals and how this may help explaining competitive advantage and economic organization. Typically, the interest has here centered on the tacit and distributed character of much production knowledge. Indeed, capabilities are precisely characterized by these features: they may be seen as team-embodied and partly tacit production and organization knowledge that can be operated by team-members for a strategic purpose. Moreover, these qualities may make valuable capabilities hard to imitate, and thus underlie sustained competitive advantage (Barney 1991).

In a world of tacit and distributed knowledge, firms typically do not confront the same production costs for the same productive tasks. Moreover, in such a world, economic activity may be afflicted with what Richard Langlois has called "dynamic transaction costs", the costs that arise in real time in the process of acquiring and coordinating productive knowledge (Langlois 1992; Langlois and Robertson 1995) and which are different in nature from the transaction costs that are caused by problems of aligning incentives. This, in turn, suggests that the capabilities perspective may be interpreted as an alternative theory of economic organization.

A possible starting point of the argument is that a firm may control production knowledge that is, in important dimensions, strongly different ("dissimilar") from what others control. And an implication may be that members of one firm quite literally do not understand what another firm wants from them (for example, in supplier contracts) or is offering them (for example, in license contracts). Because of the extreme specificity and tacitness of much productive knowledge, one firm may have difficulties understanding another firm's capabilities; and both firms separately and together may know more than their contracts can. In this setting, the costs of making contacts with potential partners, of educating potential licensees and franchisees, of teaching suppliers what it is one needs from them, etc., become very real factors determining where the boundaries of firms will be placed. Thus. coordination problems may arise because of "friction": the knowledge, cognitive frames, and skills embodied in existing governance structures (be they firms, markets, or in between) may be too inflexible, especially in the face of major "Schumpeterian" change, to seize market and technological opportunities (Chandler 1992). In such circumstances, other governance structures that can muster the necessary capabilities may arise and prosper.

The upshot of this section is that the capabilities perspective indeed is a distinct emerging perspective on economic organization, one that would appear to be particularly well suited to explaining the boundaries of the firm in dynamic environments. It is characterized by highlighting explanatory mechanisms that are different from those of modern economics of organization, not the least with respect to the attempt to restore knowledge to is rightful place as a determinant of, not only competitive advantage, but also economic organization. However, in many respects the capabilities perspective suffers from weaknesses:

- As many writers (including Porter 1994) have pointed out, there is a distinctively retrospective character to the perspective; in other words, it is not (sufficiently) predictive, and its applicability to practical decision-making is therefore somewhat doubtful.

- Relatedly, one is not being told very much about the accumulation of new, valuable, hard-to-imitate resources, the emphasis clearly being placed on evaluating existing resources (e.g., Barney 1991).
- As argued at length in Foss (1996b&c, 1997c), there are also deep problems with the perspective in its manifestation as a theory of economic organization. For example, it does not convincingly explain the existence of the firm, and it has nothing to say about asset ownership.

C. Summing Up

The argument so far can be summarized thus: in searching for a strategic theory of the firm, we are confronting two imperfect contenders that are characterized by explaining economic organization in widely different ways. I have discussed their imperfections and explained why they both at their present state of development are unlikely to serve as bases for a strategic theory of the firm. To put it briefly, while the economics of organization is of considerable relevance to the strategy field, it is also likely to misrepresent many strategy issues because of its static nature and its neglect of knowledge. On the other hand, while the capabilities perspective arguably lies closer to the traditional interests and concerns of the strategy field (because this is partly where it was originally developed), it is at present too explanatorily unclear and has too much of a retrospective character to serve as a strategic theory of the firm. The contention that will be briefly elaborated in the next section is that a real options perspective has the potential to help remedying these defects. With respect to the contractual perspective, an options perspective leads us to ask questions relating to the economic organization of options which leads into issues of innovation, corporate venturing and organizational learning. And with respect to the capabilities perspective, an options perspective has the potential to do away with an overly retrospective orientation,

precisely because the options perspective directs our attention to future possibilities of action.[6]

III. Organizing Real Options

A. The Options Lens on Strategy

Originally developed in the context of finance theory (Myers 1977), and applied to capital budgeting and issues relating to the allocation of resources for R&D purposes, the real options perspective is increasingly making an impact in the broader strategy field (Sanchez 1993; Cowman and Hurry 1993). The reason is rather obvious: as the change in technologies, preferences, regulations, etc. seems to have substantially, so has calls for increased flexibility in increasingly dynamic markets. Firms have been urged to develop those "dynamic capabilities" (Teece, Pisano, and Shuen 1997) that will help them achieve this flexibility.

However, flexibility has been notoriously hard to conceptualize; what precisely should be flexible, to which extent should flexibility obtain, etc. As Ron Sanchez (1993) points out, a primary attraction of a real options perspective is precisely that it provides some formal discipline to loose notions of flexibility in the context of the firm strategy field. Thus, an options perspective indicates, for example, that optimal flexibility is not maximum flexibility, since the costs of acquiring "maximum" flexibility are unlimited. Optimal flexibility corresponds to the plan of action that enables the firm to acquire the set of options that maximizes the net present value of the firm. This has direct strategic relevance, for strategy may be seen through the options lens (Bowman and Hurry 1993) as a process of organizational resource-investment choices or options.

[6] This argument can also be found in Sanchez (1993).

Thus, in a useful discussion, Sanchez (1993) points out that to the extent that we wish to conceptualize strategic flexibility through the options lens, we may do so by thinking of firms as being flexible in terms of, for example, *which products* they wish to produce, *when* they will produce (and develop and market) these products, and *how* the production (and sale and marketing and development) of the products should be *organized.* Because an option is a right to choose whether or not to take an action now or at some future time, this means that we can speak, referring to these three sets of choices, of product options, timing options, and implementation options. This has rather direct links to some aspects of the preceding discussion. For example, what Penrose (1959) calls the firm's "productive opportunity set" – which encompasses all of the opportunities that the firm's management can see and can (but doesn't have to) take advantage of – clearly constitutes a set of real product options. In principle, these real options can be valued, using the same tools that have been developed in the context of financial options.

The contention here is that the options perspective not only has implications for firm strategy, but also for the theory of economic organization. For example, an options view on economic organization better helps us, I suggest, to recognize the benefit aspects of firms, hybrids and markets, something that may sometimes have been neglected in some quarters of the contractual approach to firm, because of its near exclusive concern with transaction *costs.*

B. Institutions as Reserves

A good starting point for developing these implications is to pick up on an idea developed by the economist Brian Loasby (1976, 1994a&b) and conceptualize institutions in general as substitutes for contingent claims markets, more specifically, as *reserves.* The thrust of Loasby's argument is that when there is not a complete set of contingent forward markets – not just because transaction costs close these, but more fundamentally because there cannot be markets for goods and services that haven't even been imagined yet – there is a need for flexibility-

providing institutions, for reserves in short. "Both firms and markets", Loasby says, "... are devices for creating and preserving the possibility of future transactions; they are intangible and complex capital assets which are valuable precisely because the future is not predictable enough to justify present commitments" (1994: 8). For example, the institutional structure of an organized market is a set of sunk-cost investments (Casson 1982) that implies the commitment of the involved parties to sustain a possibility for future transacting, and therefore provides a set of options to buy and options to sell. But, as Loasby points out, we may view the firm in exactly the same terms:

> The firm is a response to structural uncertainty. If there are no adequate markets for contingent commodities because no-one knows how to specify the appropriate contingency sets, then the remedy is to create option sets in the firm of reserves (1994: 252-253).

In this view of institutions-as-reserves, what would primarily seem to distinguish firms and markets is that whereas ongoing markets are undesigned institutions that embody options for future contracts, ongoing firms are designed institutions that embody contracts for future options, as it were.

C. Firms as Options-Providing Institutions

One possible import of Loasby's reasoning is that we may conceptualize firms as governance structures whose primary rationale lies in their provision of options. It is perhaps not so very surprising so find an embryonic options-perspective on the firm in the work of Penrose. "A firm", she explains, "... is basically a collection of resources. Consequently, if we can assume that businessmen believe there is more to know about the resources they are working with than they do know at any given time, and that more knowledge would be likely to improve the efficiency and profitability of their firm, then unknown and unused productive services immediately become of considerable importance, not only because the belief that they exist acts as an incentive to acquire new knowledge, but also because they

shape the scope and direction of the search for knowledge" (Penrose 1959: 77). We can also distill ideas about options from the broader literature on firm capabilities (although few (none?) contributors have done so explicitly), for a capability may be interpreted as a capacity to act in certain ways in a certain range of circumstances. Thus, the idea of real options is arguably inherent in the idea of capability, but needs to be unfolded, for example, in the direction of a theory of building new capabilities through the creation of options (see Sanchez 1993).

It is certainly more surprising to find ideas that stress flexibility as a part of the rationales of firms and points towards an options-perspective in the work of the founder of the contractual approach to the firm, Ronald Coase (1937). In a discussion of long-term, incomplete contracts, Coase points out that

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

This is as clear an association between the existence of the firm and the provision of flexibility – the wish to maintain and/or create a portfolio of real options – that one could wish for.

The economic logic is not spelled out in Coase's article, but it could proceed along several lines. For example, firms may be the preferred governance structure

for the creation of real options for reasons of appropriability in cases where the relevant real option are in the nature of new technological knowledge. Or one may point to the coordination gains[7] that firms may obtain relative to markets in cases where the process of creating options requires the coordination of organizational learning processes (Conner and Prahalad 1996). Because firms come equipped with incomplete contracts[8], and a supporting infra-structure of corporate cultures and management heuristics, they may under certain circumstances be the proper framework around the process of providing new options and realizing these; with Loasby (1994), they may indeed "provide contracts for future options".

In general, firms cannot exist under competitive discipline unless they earn returns on their projects that are at least enough greater than the market value of their assets to offset the unavoidable costs (Williamson 1985; Grossman and Hart 1986) of hierarchical organization (Robins 1992) – excess returns that are normally being ascribed to the presence of various hard-to-trade, specialized, organizational assets, such as team skills, culture, and the like (Alchian and Demsetz 1972; Langlois and Robertson 1995; Conner and Prahalad 1996). The suggestion here is that the ability to generate options that cannot (equally efficiently) be generated by "the market" – what may arguably be identical to the "dynamic capabilities" of Teece, Pisano and Shuen (1997) – is one further "X-asset" (Robins 1992) whose helps explaining the existence of the firm.

Whereas this reasoning is not in principle opposed to the contractual theory of the firm[9], there is a considerable change of emphasis. For instead of conceptualizing the firm as an institution that exists because it hinders something,

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[7] Firms can often save on communication costs relative to markets. See Foss (1997c) for an elaboration of this argument.

[8] Which allow for the production of new partly unanticipated learning (Loasby 1976; Foss 1996a; Conner and Prahalad 1996).

[9] Since X-assets may be specific assets in Williamson's (1985) sense and thus need the protection that unified ownership may offer.

such as opportunistic behavior, it is rather seen as existing because it promotes something, namely the production of new options. In an real options/flexibility perspective, optimal economic organization/the efficient boundaries of the firm maximizes the options value of the firm. This is considerably broader (but may incorporate) the idea that optimal economic organization minimizes transaction costs (Williamson 1985) or minimizes the costs of acquiring and utilizing knowledge (Casson 1997).

From an options perspective, firms may cease to be the proper frameworks for organizing options – for path-dependencies, organizational rigidities of all kinds, framing effects, and much else may stifle the process of creating and realizing options. In that case, the firms may dissolve, or, if it continues to exist, will exist because of other, more standard, reasons such as its superior ability to resolve incentive conflicts. Moreover, for some types of learning – for example, learning within a modular system – markets may sometimes be superior to firms (see the analysis in Langlois and Robertson 1995). As this suggests, viewing economic organization through the options lens must really be a comparative exercise, since markets and hybrid structures, such as joint-ventures, alliances and networks, may also function as options-providing institutions. For example, joint-ventures are not just means to pool complementary, but dissimilar assets (Richardson 1972) or efficient governance structures in situations of medium asset-specificity (Williamson 1996); they may also be created as real options to expand in response to future technological and market developments, the exercise of the option taking place by the acquisition of the venture (Kogut 1988). Other types of inter-firm realizations may play similar roles. An obvious question therefore is what light an options perspective cast over the issue of the boundaries of the firm.

D. The Boundaries of the Firm

Again we may refer to the work of Loasby; not just his point that we should look upon ongoing (and well-developed) markets as embodying options for future

contracts, but just as much the point that "Firms and markets are clearly partial substitutes; but it is no less important to recognize that they are also complements" (Loasby 1994a, p.8). Translated into the terminology used here, an ongoing, well-developed market complement firm organization by providing *options to wait* and *options to abandon* to firms: they allow firms to defer the acquisition of inputs and make it contingent on an actual, future need, and they allow firms to get rid of unconsumed inputs (Sanchez 1993: 272). The capability to use markets intelligently in this way may be an important source of competitive success, as the work of Casson (1997) indicates, and as the cases of NIKE and IKEA confirm.

Likewise, participating in networks and other sorts of interfirm arrangements may increase the number of real options available to firms, for example, by providing better access to other firms' capabilities (thus allowing the firm to extend its technological capabilities and generate more product options), to "thin" input markets, and to "the collective capabilities of the participants" in a network (Loasby 1994b: 263). In other words, networks may provide options (of both the timing and the product diversity) that are not easily obtained in more "normal" markets. "The consequence" of such networks, says Loasby (ibid.), "is a pool of resources, constituting a greater variety of reserves than can be accommodated within the necessary constraints of a single firm".

The other side of the coin thus is that internalization forfeits the option to wait to acquire inputs; it cuts off the firm from a contingent deferral of the commitment to incur the cost of inputs. From this perspective, firms should internalize only a few inputs that 1) are exceptionally difficult to obtain through markets or networks and 2) are capable of generating superior options values for the firm. Capabilities, particularly of the "dynamic capabilities" variety, would often seem to have precisely these characteristics. Whereas proponents of the capabilities perspective have often stressed point 1), they have more seldom stressed point 2), arguably because of the somewhat retrospective orientation of that perspective. Clearly, an options perspective casts a dynamic light over the boundaries of the firm, since

these do not just depend on current transaction cost problems (Williamson 1985) or problems of coordinating capabilities (Richardson 1972; Langlois and Robertson 1995).

From the perspective of the firm, the efficient proportion between market and hierarchy depends, not only on current transaction costs and capabilities, but more fundamentally on "a vision of possible futures" (Loasby 1994: 253), including a vision of which products the firm can produce in the future, which inputs are necessary for producing these products, and an estimate of whether input markets can be expected to be well-behaved or not (Sanchez 1993: 276). The boundaries of the firm determined by this vision may very well (in non-static environments) be different from those boundaries that period-by-period minimizing of transaction costs would imply. For example, firms may refrain from outsourcing certain activities, whose outsourcing conventional transaction cost reasoning would have dictated, because the firm expects to achieve superior option value from these activities.

IV. Conclusion

The contribution of this paper has been to review existing, predominantly economic, theories of the firm, to point out that for the purposes of developing strategic theory, these theories are lacking in several respects, and to finally suggest that a real options perspective has the potential of furthering existing theories of the firm in more dynamic directions. Thus, it has been suggested that the options perspective may supply a much-needed theory of building capabilities. And it has been argued that a consistent options perspective is likely to change some central ideas of the contractual perspective, notably ideas on the existence and boundaries of the firm. While the notion that from an options perspective, efficient economic organization maximizes joint value is not necessarily inconsistent with either

capabilities or contractual theories of the firm, it does help us extend these perspectives in a more dynamic direction. For example, in the context of the issue of the boundaries of the firm, an options perspective helps us understand how these are not just determined by current transaction costs but may depend critically upon expectations to products, technologies and organization. By highlighting these dynamic factors, an options perspective also helps bringing existing theories of the firm into closer contact with such fields as technological innovation or organizational learning which are essentially about important aspects of the process of the creation of real options. Thus, an options perspective is likely to ease the construction of a strategic theory of the firm.

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