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Edith Penrose and the Penrosians – or, why there is still so much to learn from *The Theory of the Growth of the Firm*

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I. Introduction

It is a commonplace that the great works of social science have been subject to a number of rivalrous interpretations. Thus, in economics, one often sees a received, and typically neoclassical, interpretation being up for attack from the perspective of heterodox interpretations (and I shall follow this established practice in the present paper). This is the case of the works of, notably, Marshall, and Keynes. Experts in hermeneutics may lecture us at length about the reasons why the great works are interpreted differently, and about the perplexities of textual interpretation. For example, when considering alternative interpretations, a basic dilemma is that what the “facts” of the text mean and their significance in the context of the whole text, is dependent upon their interpretation, so that there really is no external, “objective” arbiter outside of the interpretive schema for purposes of arbitration. Of course, this does not mean that we cannot engage in a reasoned discussion of the merits of alternative interpretations (Popper 1994); merely that there is no interpretation-independent standards that we may appeal to.

I plan in this paper to discuss what I consider a great work of social science (I hesitate in this connection to say “economics”, given the way this discipline looks today), namely Edith Penrose’s 1959 book, *The Theory of the Growth of the Firm*. Specifically, my aims are

- to discuss critically various interpretations of Penrose (1959);
- to argue that existing interpretations have often overlooked or suppressed her essential ideas;
- and that these essential, and radical, ideas have important implications for contemporary theorizing about the firm. Thus, I shall argue that there is a case for re-opening the research program that Penrose sketched in *The Theory of the Growth of the Firm*.

The focus will be almost exclusively on Penrose's 1959 work. This is certainly not because it is the only interesting work she wrote. Rather, it is undeniably her masterpiece; a masterpiece, however, whose fundamental message has been insufficiently appreciated. Moreover, much of her other work is not related to the arguments in this book, and are, thus, not relevant to bring into the discussion.¹

My main argument, in short, is that although *The Theory of the Growth of the Firm* has been widely read and even more widely cited, it has tended to be interpreted in ways that do not give the text full justice. Many important points have been neglected or insufficiently appreciated. Examples include Penrose's crucial distinction between resources and services, the notions of the "image" and the "productive opportunity" (more about which later), and the attention she pays to real managerial processes, and how these are manifested in the accumulation and leverage of resources and services.

When viewed through the lens provided by what is arguably the dominant contemporary approach to strategy research, namely the so-called, "resource-based perspective" (Mahoney and Pandian 1992; Peteraf 1993), Penrose comes out as one that shares the main aim of this approach, namely to analyze the circumstances under which resources may provide long-lived rent streams (e.g., Barney 1996). But this is actually only mentioned in *The Theory of the Growth of the Firm* in a rather peripheral way.²

The resource-based perspective is largely based on mainstream price-theory reasoning (see Peteraf 1993; Foss 1996, 1998b). However, in spite of this basic neoclassical orientation, the perspective has not made contact with an older literature that, among other things, attempted to cast Penrosian insights in neoclassical terms; a literature that begins perhaps with Marris (1964) and

¹ For example, surprisingly Penrose's work on multinationals (Penrose 1968, 1971) does not draw on her 1959 book. Thanks to Neil Kay for pointing this out to me.

² Note that I am not arguing that Penrose's interest in the growth process is inconsistent with this sort of resource-based research; only that it is not what primarily interests her.

Baumol's (1962) inclusion of Penrose (1959) under the rubric of "the managerial theory of the firm".³ The high point of this literature is Rubin's (1973) attempt to reconstruct Penrose (1959) in terms of finding the solution to the dynamic optimization problem of balancing the development of new resources (using existing resources) and the use of existing resources directly in production.

However, Penrose's work has also been heavily cited by heterodox economists (e.g., Loasby 1991; Earl 1996)⁴, and her foreword to the third edition of *The Theory of the Growth of the Firm* (published in 1995) leaves little doubt that her sympathies were with more heterodox strands of economics. In fact, it will be argued that the limited inclusion of Penrosian ideas in neoclassical economics is just another example of the "sponginess" of the mainstream that allows it to seemingly incorporate diverse and heterodox insights without, however, really taking seriously their heterodox nature (*Section II: Penrosians - and Penrose*).

Rather than thinking narrowly of Penrose's work as just another contribution to the managerial theory of the firm or as the most important precursor of the contemporary resource-based approach, it is more appropriate, I shall argue, to think of Penrose as re-stating, refining, and sometimes radicalizing, the basic conceptualization of the firm that can be found in the work of Marshall and his later followers (cf. also Loasby 1991). Specifically, like Marshall, and later writers in his tradition,⁵ Penrose emphasized that not only is the firm a repository of productive knowledge, but it is also an institution that develops and manages this knowledge and that the two processes of developing

³ For a brilliant critique of this literature, see Loasby (1989).

⁴ I have argued elsewhere that the economist whose work in many respects lies closest to Penrose's is the idiosyncratic, but often brilliant Thorstein Veblen (Foss 1998a).

⁵ Such as Philip Andrews (1949), Jack Downie (1958), Harald Malmgren (1961), George Richardson (1972), Brian Loasby (1991), Richard Langlois (1992), Nicolai Foss (1993), Peter Earl (1996), and Neil Kay (1997). For a splendid discussion of the post-Marshallian stream in economics, see Finch (1997).

and managing knowledge may be hard to separate, both in practice and conceptually.

This, I shall argue, is the essential Penrosian point. Moreover, it is one that has been missed by the vast majority of those who have cited or quoted her work.⁶ Typically, they have either emphasized her view of the firm as a repository of specialized and heterogeneous production and organization knowledge to the exclusion of the issue of the management of the associated stocks and flows (this holds for resource-based writers), or they have emphasized a single aspect of Penrose's discussion of the management team (this holds for those who have written on "the Penrose effect") to the exclusion of almost everything else in *The Theory of the Growth of the Firm*. I hope, however, to demonstrate that focusing on *both* issues is a potentially extremely fruitful avenue in research on the theory of the firm (*Section III: Implications for Contemporary Theorizing About the Firm*). Hence, the title of this paper.

II. Penrosians – and Penrose

"The entire study [*The Theory of the Growth of the Firm*] is essentially a single argument no step of which can be omitted without the risk of misunderstanding later conclusions" (Penrose 1959: xxii).

A. Penrose: Received Views

The usual outline of the main argument of Penrose's 1959 book is well-known and shall be only briefly summarized: Firms are collections of productive resources that are organized in an administrative framework which partly determines the amount and type of services that the resources yield. As they go along with their productive operations, firms – or, more precisely, the management team – obtain increased knowledge of the services that may be

⁶ Exceptions to this generalization are Loasby (1991), Fransman (1994) and Spender (1994).

obtained from resource. The results of such learning processes is, first, the expansion of the firm's "productive opportunity set" (the opportunities that the firm's management team can see and can take advantage of) and, second, the release of managerial excess resources that can be put to use in other, mostly related, business areas. Since the opportunity costs of excess resources are zero, there will be a strong internal incentive for such diversification which in turn causes the firm to grow – an idea that according to Penrose destroys the notion of the firm's optimum size.

However, the managerial resources inherited from the past set a limit to the firm's rate of growth – what has become known in the literature as "the Penrose effect" (Slater 1980).⁷ In Penrose (1959), this is rationalized by pointing to the difficulties of socializing new managers that are needed for the expansion of the firm. Later models (Baumol 1962; Marris 1964) imposed the Penrose effect exogenously (Gander 1991), but eventually it became subordinated under supposedly more general theories of adjustment costs in the theory of investment of the firm (Treadway 1970). Given this, and using a dynamic control theory approach, the Penrose effect arises naturally as the profit-maximizing firm calculates its optimal time-profile of outputs. A steady-state equilibrium growth pattern is shown to exist, in which firm size and management size grow at the same rate (Marris 1964; Slater 1980; Gander 1991).

Thus, Penrose's ideas became absorbed in mainstream economics by, first, arguing that her purportedly most important point, "the Penrose effect", was just a minor detail in the neoclassical analysis of optimal investment, and, second, by demonstrating that Penrose's critique of equilibrium economics should not really be taken seriously, as her ideas were fully compatible with extended notions of equilibrium. This is not to deny that the basic skeleton of some of Penrose's ideas may be cast in the language of equilibrium and (dynamic) optimization

⁷ Richardson (1964) provides early empirical evidence.

characteristic of mainstream economics. But it is to argue that such interpretations at the very least miss important aspects of *The Theory of the Growth of the Firm*, and at their worst (and this is more likely) are grossly misleading.

Another, but rather different, stream of work that builds on foundations partly derived from mainstream economics and explicitly takes the Penrose's work as a primary source of inspiration, is the recent resource-based approach to the firm and to firm strategy. The resource-based analysis of (sustained) competitive advantages may be seen as starting out from two basic empirical generalizations, namely that 1) there are systematic differences across firms in the extent to which they control resources that are necessary for implementing strategies, and 2) that these differences are relatively stable. The basic structure of the RBP emerges when these two generalizations are combined with fundamental assumptions that are to a large extent derived from economics. Among these assumptions are that 3) differences in firms' resource endowments cause performance differences, and 4) that firms seek to increase their economic performance. The fundamentals of the resource-based analysis of the conditions for sustained competitive advantage are basically simple (Peteraf 1993).

We begin with the basic condition that resources must be heterogeneous in order for efficiency differences, and therefore rents, to exist. However, if the firm is to appropriate this rent, further conditions must hold. Thus, resources have to be acquired at a price below their discounted net present value in order for the firm to appropriate the rents flowing from the resource; otherwise, these will be fully absorbed in the price paid for the resource. Moreover, it should be difficult or impossible for competitors to imitate or substitute rent-yielding resources. However, in successful firms there are often a number of mechanisms at work that make it hard for competitors to copy the sources of competitive advantage of a successful firm. For example, there may be "causal ambiguity", which means that competitors confront difficulties ascertaining precisely how a bundle of resource contributes to success. Finally, the resource should be relatively specific to the firm (in the sense of

Williamson 1985). Otherwise, the superior bargaining position that is obtained from not being tied to a firm can be utilized by the resource ('s owner) to appropriate the rent (or, at least a large portion of the rent) that the resource helps create. In other words, the key question to ask here is, Who captures value from the resource, and how may the firm capture more value from this resource?

Note that all of this, purportedly Penrosian analysis, is really just an application of equilibrium price theory.⁸ For example, in connection with ex ante limits or barriers to competition, these limits are evaluated relative to a full information, competitive equilibrium (Barney 1986). Indeed, the very concept of sustained competitive advantage is often defined in equilibrium terms: it is that advantage which lasts after all attempts at imitation have ceased. This has the implication, unfortunately, that sustained competitive advantage has no meaning outside equilibrium, which to those who don't believe that the world is not continuously in competitive equilibrium, would surely seem to limit the practical relevance of this concept. Second, the above analysis actually tells us very little of direct value for understanding the more dynamic and managerial aspects of competitive advantage, such as how to build new resources, coordinate existing ones, etc. – all issues that are crucial in *The Theory of the Growth of the Firm*.⁹ For example, with respect to the issue of coordinating activities, the resource-based perspective basically assumes that this is unproblematical (Haanaes 1997).¹⁰ And to the extent that it has addressed Penrosian issues, it has typically done so on a relatively aggregate level, talking about corporate culture or the overall competence of the management team (the

⁸ More specifically, as I have argued elsewhere (Foss 1998b), it is the Chicago-UCLA brand of price theory on which the basic resource-based analysis of sustained competitive advantage is based.

⁹ J.C. Spender (1994) launches a similar critique: "When we overlook the resource application processes we miss what it means to bundle resources together so that they become a firm. We overlook the core of our theory of the firm, the process of coordinating the organization's activities ... Resource-based theory has paid little attention to the construction and management of the bundle".

¹⁰ One could arguably give this point a transaction cost or agency interpretation, so that in the resource-based perspective all problems of incentive alignment are assumed away.

same may be said of the managerialist theory of the firm). But Penrose was (also) concerned with the more microscopic aspects and one might even construct an argument that her theorizing leads us to what would in modern management studies be called “strategic human resource management” where the focus is on the development of the firm’s pool of talents with particular goals in mind.¹¹

We should not be surprised, therefore, that apparently Edith Penrose herself remained skeptical towards the resource-approach – at least in the manifestation considered here.¹² For in fairness, it must be observed that an important research theme in the resource-based perspective has in fact been diversification, and here Penrose’s insights have arguably been more adequately represented, although much of this literature is also cast within the maximization/equilibrium framework of mainstream economics (e.g., Montgomery and Wernerfelt 1988).

B. Neglected Points in Penrose’s Analysis

Thus, there has been a powerful tendency to interpret Penrose’s ideas in terms of mainstream economics. And this is perhaps not so surprising, if we take these ideas to merely be that 1) there is a constraint on the growth of the firm stemming from the difficulties of expanding the management team, and 2) firm heterogeneity is the source of differences among revealed competitive advantages. Both of these points lend themselves to formal modelling without too much difficulty. Thus, we have already seen how formal modelling can accommodate the idea of the managerial constraint on growth through the notion of balanced firm growth (Marris 1964; Slater 1980), and we can also easily imagine an equilibrium of firms with different efficiencies where the equilibrium

¹¹ Thanks to Peter Earl for this point.

¹² In his recent Ph.d. dissertation, Knut Haanæs (1997: 17) explains how he in a meeting with Penrose “... argued that the resource-based literature did not fully explain value-creation (instead focusing on the value appropriation aspect). Professor Penrose expressed a strong agreement with my observations ... The problem was, she said, that the resource-based literature had not fully pursued her position and had been too concerned with the analytical properties of resources. The literature had, hence, partly neglected her fundamental insight that resources were only a means to an end”.

(and the different efficiencies) is sustained because of the existence of various mechanisms (causal ambiguity, patents, etc.) that hinder the equalization of rents across firms.¹³

It is more difficult to imagine a mainstream treatment of Penrose's point that efficient diversification takes place on the basis of the firm's existing endowment of resources and competencies – that efficient diversification lies “close in” to existing competence areas–, and I don't know of any formal models that address this. However, in principle it may be done, for example, by constructing some sort of index of relatedness of input factors and telling some plausible (if not entirely rigorous) story about the correspondence between this index and various information and transaction costs (so that managing less related resources and competencies imposes a information and transaction cost penalty). Imposing the requirement of choosing the optimal trade-off between the gains from diversification and the costs of managing a diversified firm then allows one to derive the optimal/equilibrium degree of diversification of the firm.

Let us not forget, however, that although such mainstream treatments of Penrose's insights may be valuable and justified, they, first, run counter to Penrose's own critique of (parts of) neoclassical economics, and, secondly, typically leaves out crucial issues and aspects of Penrose's analysis.

With respect to the first point, on Penrose's own view, her theory constituted a powerful critique against certain aspects of the neoclassical theory of the firm. In the neoclassical theory of the firm, she says, there is “... no notion of an *internal* process of *development* leading to cumulative movements in any one direction” (1959: 1), a notion that is absolutely crucial for understanding firm development. Rather, growth is simply a matter of adjusting to the equilibrium size of the firm. But if services are produced endogenously (and continuously) through various intra-firm learning processes involving increased knowledge of

¹³ The seminal modeling effort here is Lippman and Rumelt (1982).

resources, “new combinations of resources” (1959: 85), and an expanding productive opportunity set, there is no equilibrium size.

Moreover, because of the difficulties of managing new resources and services, and of assimilating new managers in the firm, firm growth is not smooth or “balanced” (as in Marris 1964; Slater 1980). On the contrary, growth rates in succeeding periods will typically be negatively serially correlated, so that high growth in one period is followed by low growth and *vice versa*. In fact, *this* is the true “Penrose effect”, and a first indication that even on this fundamental level, Penrose has been partly misrepresented in the literature. But, I shall, argue, if we replace our mainstream spectacles with heterodox economics ones, there is much more that becomes visible.

On the overall level, there is clearly what we perhaps today would recognize as a Veblenian (the emphasis on cumulative causation and group-based knowledge assets) and Schumpeterian (change “from within”) flavor to Penrose’s overall argument. Although she doesn’t refer even a single time to Veblen in *The Theory of the Growth of the Firm*, her later (1995) nutshell conceptualization of main message of the 1959 book is straight out of Veblen: “One of the primary assumptions of the theory of the growth of firms is that ‘history matters’; growth is essentially an evolutionary process and based on the cumulative growth of collective knowledge, in the context of a purposive firm” (1959[1995]: xiii). And the Schumpeterian flavor of her work is more than a matter of spicing up the arguments with the standard quotations from Schumpeter that mainstream economists, too, fancy.

More fundamentally, Penrose’s basic vision of the competitive process in general, and of the firm in particular, is, as we have already seen, disequilibrium-oriented and, as I shall later argue, subjectivist.¹⁴ Moreover – and this is normally overlooked – it stresses entrepreneurship, flexibility, change and uncertainty.

¹⁴ Quite in line with the post-Marshallian tradition of which she is often seen as an important representative.

This is arguably somewhat in contrast to the path-dependence and rigidity effects with which her 1959 analysis is often associated, at least to extent that this analysis is interpreted as an endorsement of only extremely narrow diversification. “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 and adaptation really are just as much a message of the analysis as specialization is. The paradox vanishes on realizing that specialization in Penrose’s analysis means specialization in terms of the underlying base of resources and competencies (rather than products) and that such specialization may be fully consistent with seizing new business opportunities, for example, in the form of diversifying to new product markets that are, at least in terms of products, “unrelated” relative to the firm’s existing product portfolio.¹⁵

In fact, as Penrose makes clear, there may be a considerable option value associated even with a specialized base of resources and services:

A firm 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

¹⁵ As she explains, “Firms, for the most part, do ‘specialize’, but in a much wider sense than the ‘logic’ of industrial efficiency would suggest, for the kind of ‘specialization’ they seek is the development of a particular ability and strength in *widely defined areas*” (1959: 137; emphasis added).

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).

In other words, “businessmen” may have a rational expectation that the resources and services that they control may yield more options than are immediately apparent and that further learning about them may reveal these options – a striking anticipation of that real options thinking that has only made its way in economics and the firm strategy field during the last five years. Thus, firm development is essentially an evolutionary and cumulative process of “resource learning” (Mahoney 1995), in which increased knowledge of the firm’s resources both help create options for further expansion and increases absorptive capacity (Cohen and Levinthal 1990), or, to use Penrose’s terminology an expanding “*productive opportunity*”.

The firm’s productive opportunity, arguably the key concept of *The Theory of the Growth of the Firm* (cf. also Fransman 1994: 744), is “... the productive possibilities that its ‘entrepreneurs’ see and can take advantage of. A theory of the growth of the firm is essentially an examination of the changing productive opportunity of firms” (1959: 31-32). Thus, the notion of productive opportunity is quite a central notion in *The Theory of the Growth of the Firm*. Moreover, it is also quite clearly a subjective (or, if you prefer, “constructivist”) category,¹⁶ hinging on the, as modern organizational theorists (notably, Weick 1995) say, “enactment”

¹⁶ Penrose elaborates: “... for an analysis of the growth of the firm it is appropriate to start from analysis of the firm rather than the environment and then proceed to a discussion of the effect of certain types of environmental conditions. If we can discover what determines entrepreneurial ideas about what the firm can and cannot do, that is what determines the nature and extent of the ‘subjective’ productive opportunity of the firm, we can at least know where to look if we want to explain or predict the actions of particular firms” (1959: 42).

of the environment that the management team performs, so that “... the relevant environment is not an objective fact discoverable before the event” (1959: 41).¹⁷

Penrose’s subjectivism is particularly apparent in her adoption of Kenneth Boulding’s (1956) concept of “the image”: “... the environment is treated ... as an ‘image’ in the entrepreneur’s mind of the possibilities and restrictions with which he is confronted, for it is, after all, such an ‘image’ which in fact determines a man’s behavior” (1959: 5).¹⁸ ¹⁹ Thus, enacting the environment is clearly a part of entrepreneurial action. Indeed, anticipating Israel Kirzner’s (1973) theory of entrepreneurship, Penrose notes that “... the decision to search for opportunities is an enterprising decision requiring entrepreneurial intuition and imagination and must precede the ‘economic’ decision to go ahead with the examination of opportunities for expansion” (1959: 34).

We may now sum up this brief discussion and note that although the literature – whether managerialist economics à la Baumol (1962) and Marris (1964) or the recent resource-based strategy literature – may have addressed some key themes in *The Theory of the Growth of the Firm*, much else has been missed. Not surprisingly, what has been addressed has been those features that lend themselves to a treatment that is congenial to mainstream economics, and those features that have been left out are those that clash with basic mainstream ideas.

¹⁷ Elaborating the cognitive content of the notion of the firm’s productive opportunity, Penrose explains that there “... is a close relation between the various kinds of resources with which the firm works and the development of the ideas, experience and knowledge of its managers and entrepreneurs” (Penrose 1959: 85).

¹⁸ And as Penrose further explains, the image is heavily conditioned by “... the resources with which a firm works and on the development of the experience and knowledge of a firm’s personnel because these are the factors that will to a large extent determine the response of the firm to changes in the external world and also determine what it ‘sees’ in the external world” (1959: 79-80).

¹⁹ It should be noted that the idea of the image is not just another version of the ideas of bounded rationality and tacit knowledge. It explicitly recognizes that agents have to make sense of their world, that agents’ cognitive development is molded in social processes, and it implies that tacitness is an aspect of virtually all acts of interpretation and meaning attribution.

For example, a major focus of *The Theory of the Growth of the Firm* lies in the production of services and the application of resources and services, a main argument being that many heterogeneous services may be yielded by the same resources, depending on the uses to which the management team decide to put them and depending on the knowledge its has of these resources. But this has been almost entirely neglected by many resource-based theorists who only consider the issues of the terms at which resources were acquired (Barney 1986) and/or whether they are protected (Peteraf 1993), but forget that it is the actual application in production, and not the mere possession, of resources that create revenue (Spender 1994). The other main literature that has addressed Penrosian ideas, the managerialist theory of the firm, on the other hand, suppressed all those considerations that could not be integrated with (or, of course, were irrelevant to) simple models in which managerial capacity acts as a constraint on growth.

Indeed, the overall impression of the theory contained *The Theory of the Growth of the Firm* that emerges from the literature is one of a theory stressing rigidity and path-dependence. Thus, in each period of time there is a strict managerial limit (although it recedes in the next periods) constraining growth and the firm's horizontal boundaries are narrowly constrained to neighboring product-markets. The point of the above discussion has been to argue that it is more sensible to think of *The Theory of the Growth of the Firm* as stressing *constrained flexibility*. Penrose's basic, and too often overlooked, themes are flexibility in an uncertain world, organizational learning as an evolutionary discovery process, the vision of the management team, entrepreneurship, etc., and she applies those themes to an understanding of firm growth through diversification, finding in the process of application that there are powerful factors that constrain flexibility, learning, vision and discovery.

It is one thing to argue that an important work has been misread, misinterpreted, neglected, etc.; quite another thing is to argue that those aspects

that were misread, etc. still matter. The following section argues that in fact there are still important lessons to be derived from the work of Penrose, particularly with respect to contemporary theorizing on the firm.

III. Implications for Contemporary Theorizing About the Firm

In *The Theory of the Growth of the Firm*, Penrose was both critical and constructive; critical of the limitations of the neoclassical theory of the firm of her day, and clearly constructive by putting forward a new theory of the firm, based on knowledge and cognition. In a similar vein, the purpose of this section is to criticize contemporary neoclassical theories of the firm, namely contractual theories, from a Penrosian point of view, and to suggest how Penrosian insights may further the theory of the firm, considered from the point of view of contemporary theorizing.

A. The Heuristics of the Modern Contractual Theory of the Firm²⁰

Although there is undoubtedly some diversity in the contractual (or, Coasian) theory of the firm associated with such names as Ronald Coase (1937), Oliver Williamson (1985, 1996), Paul Milgrom and John Roberts (1992) and Oliver Hart (1995), it is fair to say that the literature is in agreement on the fundamentals. The basic insight is that in addition to production costs of the usual sort, one must also consider transaction costs in explaining institutions like the firm. Indeed, the Coasean literature of the last 25 years has indeed focused precisely on the comparative transaction costs of alternative organizational structures, including, paradigmatically, the choice between firms and markets. Moreover, the literature has seen “the nature of the firm” — and of other institutions — as fundamentally contractual. That is, firms and other institutions are alternative

²⁰ This section borrows from Langlois and Foss (1997).

bundles of contracts, understood as mechanisms for creating and realigning incentives. Finally, these bundles are seen as efficient ones, in the sense that they efficiently handle the real resource scarcities associated with asymmetric information and bounded rationality and maximize joint surplus.²¹

Whatever their differences may be, one central heuristic characterizes all the different streams that together constitute the modern theory of the firm: an overriding emphasis on conceptualizing virtually *all* problems of economic organization as problems of aligning incentives. A specific example of this heuristic is a recent paper by Rotemberg and Saloner (1994). They address what is often seen as a Penrosian theme, namely that firms may be better off pursuing narrow strategies. Specifically, they use the incomplete contract framework of Oliver Hart (e.g., 1995) to argue that a firm may choose a narrow strategy (and thus ignore profitable opportunities) because strategic breadth leads to implementation problems *ex post* that distort *ex ante* incentives. They do note (p. 1131) that “increasing returns to specialization” (because of learning advantages from concentrating on well-defined capabilities) may be an independent reason for narrow strategies, but they do not investigate that possibility – because this would mean breaking with the heuristic of reducing all problems of economic organization to problems of aligning incentives.²²

²¹ As has often been pointed out, there is a strong functionalist orientation to this literature, one that arguably would be wholly alien to Penrose (cf. Foss 1998a). This orientation is supported by the suppression of knowledge in the contractual literature which again allows the suppression of cumulative processes resulting from the growth of knowledge inside and between firms (about which, see Loasby 1991).

²² A broader example is supplied by Paul Milgrom and John Roberts’ successful textbook, *Economics, Organization and Management* (1992) in which the managerial task is essentially reduced to the provision of the right incentives. As Brian Loasby (1995) points out, the book contains much interesting material about economics, less material about organization and relatively little that a more traditional scholar in the field would call management, including strategic management, proper. To put it in a pointed way, the book certainly does not tell us “... how Jones should decide what to do at nine o’clock on Monday morning” (Loasby 1995: 474). But this is the crucial issue: how is the set of possible choices discovered? How are the consequences known? These are issues of discovery and imagination, and they are not easily translated into the language of optimization and incentives. However, they are what managers, particular higher-ranking ones, do.

The problem is not that reformulations of traditional management and strategy issues in terms of the provision of incentives are internally inconsistent. Rather, the issue is whether the mechanisms so identified are in fact plausible explanations of the phenomena under study. In fact, it is quite likely that the mechanisms underneath, for example, the narrow firm strategies that Rotemberg and Saloner (1994) talk about have little or nothing to do with the alignment of incentives, and have everything to do with limited knowledge, learning and vision – in short, with crucial Penrosian themes.

The point here is not that one should never model problems of organization or management as only problems of incentive alignment. Arguably, an important aspect of how agents can adapt to knowledge dispersed among them has to do with overcoming impediments in the form of incentive conflicts. But certainly casual empiricism confirms that issues that relate to organizational language, shared vision and other issues that were highlighted by Penrose in her analysis of the managerial team, are also crucial for understanding the coordination of knowledge in most social systems, including firms. Thus, to conceptualize coordination, leadership and managerial activity in general as a merely a matter of providing the right incentives closes off a range of plausible alternative explanations of what firms are and what strategic managers do. In order to investigate other plausible alternative explanations it may pay off as a research strategy to suppress the heuristic of conceptualizing all coordinative and managerial activity as a matter of providing the right incentives under conditions of asymmetric information, and focus instead on more cognitive issues. The following section takes a few stabs at this.

B. Knowledge and Cognition

A pertinent place to begin is where Penrose began: with managerial cognition and decision-making. In the view taken by Penrose²³, managers exercise

²³ And much earlier by Frank Knight (1921). A modern development of Penrose's analysis of cognition is Earl (1984).

judgment based on their imagination (Shackle 1972). Imagination, in turn, is partly rooted in (imperfect) cognition and knowledge.²⁴ Thus, arguably the essence of strategic decision making is not choice among given alternatives,²⁵ but the process by which the strategizer understands his environment (including, as Penrose stressed, “his” firm’s resources), define which variables are relevant, attaches meaning to information and produce problem-solving heuristics. All our knowledge of this sort of problem-solving behavior in complex environments indicates that it, first, is not best represented by an optimization calculus (Dosi and Marengo 1994), and, secondly, is of considerably broader scope than finding the transaction cost minimizing organizational form. If (strategic) managers are judged by their ability to make the right choices among a set which they themselves partly generate, they are also judged by their ability to break with existing practice, to mediate and to engage in sense-making (Weick 1995). Thus, leadership and the provision of cognitive frames enter the picture.

These are phenomena that are hard to accommodate in the context of organizational economics, which – like the rest of mainstream economics – assumes that agents come endowed with essentially the same cognitive frames. This means that “... ignored in most economic theory is the possibility – indeed the virtual certainty – that the way each of us frames problems will prevent us from recognizing significant opportunities or major threats” (Foss and Loasby 1998: 11). Thus, the manager of division A has essentially the same understanding of what goes on “out there” as the manager of division B, and as top-management. Therefore, his failure to take the right action (or provide the right level of effort) can only be ascribed to morally hazardous behavior.

²⁴ Indeed, the formation of a new firm or a new venture is an instance of something imagined deemed possible on the basis of the available evidence (Knight 1921).

²⁵ For example, given governance structures.

In reality, however, an important part of what managers do, and a major organizational design problem, is to get everybody on the same wavelength, as it were. Now, organizational design has a long history in formal economics, for example, in the guise of mechanism design where part of the designer's task is to design codes and languages that will allow agents to efficiently respond to messages from the center. But in the context of real-world firms, this portrayal of the designer's task may be grossly misleading: in order to design optimal codes, the designer must know the entire range of possible realizations of each agent's (employee's) private information, which is not only highly unlikely given the dispersed nature of knowledge in large firms but also neglects that the whole premise of the analysis is limited communication and knowledge (Wernerfelt 1997). Furthermore, information is not just private, but also empirical²⁶ and tacit in the sense of Polanyi (1958) of not being given to verbal expression. Finally, Shacklian surprises may be involved, which means that map from states of the world to actions is incompletely specified.

All this implies that concepts such as adaptation, coordination, management, etc. become intimately associated with learning, rather than with picking alternatives out of an already known set.²⁷ Moreover, because of the surprise element, learning must involve more than Bayesian revision of priors into posteriors (which arguably is more in the nature of information processing than in the nature of true learning); it must also involve setting up new interpretive frameworks – new “images”, in Penrose's (1959) terms – for handling new types of problems. Indeed, in this perspective, the essence of economic behavior would seem to lie in understanding the environment, defining what are the relevant variables in that environment, making sense of incoming

²⁶ In the Hayekian sense that agents primarily seek “knowledge of the particular circumstances of time and place” (Hayek 1945: 52). Closely related to this, knowledge is problemistic in the sense that it arises in the context of a problem situation.

²⁷ This will certainly not come as a surprise to modern organization theorists; see, for example, March (1988).

information, generating procedures which can help solving problems, and, finally, actually taking action (ibid.; Dosi and Marengo 1994; Marengo 1995).

In terms of the economics of information, one implication is that the “information partition postulate” (Marengo 1995) should be discarded. This postulate holds that there 1) is an isomorphism between the real world and an agent’s image of it, 2) that agents only differ with respect to decision-making capabilities in terms of how fine or coarse their information partitions are, 3) that information partitions are given, and 4) that genuine knowledge gaps, such as mistakes and surprises, can be ruled out (ibid.).

If these assumptions hold, it is hard to argue that rational, interacting agents should persistently hold different images of the world. In such a setting, coordination problems are if not entirely eliminated then certainly much reduced in importance. The economic problem essentially reduces to giving people who already are on “the same wavelength”, as it were, the right incentives – that is, the problem studied in virtually all of the modern economics of organization.

However, if it cannot be presumed that division X understands the same by the message “the state of the world is Z” as division Y does, or if the divisions do not understand the message at all, then the overriding organizational design objective is creating a shared knowledge-base and getting everybody on the same wave-length. In firms that primarily grow through mergers and acquisitions this may be an extremely time-consuming and costly process, and this has often been singled out as one of the important reasons why mergers may break up again. Agents that are engaged in productive activities often spontaneously develop shared mental construct, or, if you like, “corporate cultures”, that help coordinating distributed knowledge by infusing employees with firm-specific shared knowledge; that is, they are Schelling points that resolve basic coordination problems.²⁸

²⁸ The significance of these shared mental constructs lies not only in helping the coordination of existing distributed knowledge; they also help coordinate intra-firm learning processes. In short, they help the firm organize a localized discovery procedure (as distinct from the global discovery procedure of the market). However, shared mental constructs also change over time – along with the

C. Penrosian Insights and the Theory of the Firm

In this section, I present in telegraphic form some consequences for the theory of the firm of adopting the Penrosian perspective on cognition and knowledge described in the previous section.

As a starting point, we can imagine many ways in which knowledge may be present in a social system; for example, knowledge – whether it is explicit or tacit, subjective or objective, etc. – may be

1. *Private*: Private is here used in the standard sense of the term. Agents know different things and this knowledge is not brought into contact.
2. *Distributed*: This means is that a group of cooperating agents “know” something that no individual agent knows. For example, literally speaking, no individual agent knows how General Motors makes cars; it is the whole team of GM employees that possesses this knowledge. Of course, there can be a sort of transcendental knowledge of distributed knowledge, for example, when a Penrosian management team knows that the firm’s distributed knowledge can be mobilized in certain productive tasks.
3. *Shared*: Agents share some knowledge about the world. For example, the management team in *The Theory of the Growth of the Firm* share an image of the environment and is agreed on the character of the firm’s productive opportunity.
4. *Common*: This is the game-theoretic notion that “I know that you know that I know...etc.”.

Of course, this taxonomy²⁹ in itself says little or nothing about the organization of the relevant knowledge, in terms of markets, hierarchies and other types of

learning processes they help organize. We are talking, in effect, about “co-evolutionary” processes (Marengo 1995).

²⁹ Which I owe to Luigi Marengo.

governance. For example, knowledge can be shared (category 3) inside firms, across firms, in industries, in whole societies, etc.; in principle, irrespective of whether it is explicit or tacit. For example, moral codes are very broadly disseminated knowledge, containing much tacit knowledge. However, one may conjecture that the “thickness” of tacit knowledge is a negative function of the size of the relevant social group. Thus, firms and families may, because of the continuity of association, cultivate much more shared tacit knowledge (whatever that precisely means) than broader social entities. To the extent that this tacit knowledge is valuable, there may be a link to the existence of such smaller social entities.³⁰

More generally, it may be suggested that interesting problems of economic organization are primarily related to categories 2 and 3, although it is categories 1 and 4 that have typically been the dominant ones in economics. For example, with common knowledge assumptions all problems relating to economic organization – both coordination and incentive-related problems – are trivialized. On the other hand, the notions of distributed and shared knowledge, both of which are strongly emphasized in *The Theory of the Growth of the Firm*, raise important but ill-understood problems for the theory of economic organization, some of which will briefly be mentioned in the rest of this section.

First, distributed knowledge must somehow be coordinated if it is to be useful in productive tasks. In principle, any social organization faces this coordination problem (Hayek 1945). For some productive tasks, distributed knowledge may be coordinated by means of the price mechanism, while other productive tasks require a shared knowledge base. As Marengo (1995) argues, if agents entering the firm held the completely same habits of thought/models of the world, the only obstacle to efficient coordination of their actions would be

³⁰ For example, in terms of the standard contractual story, knowledge-based rents need a governance structure that can safeguard them against opportunistic attempts at appropriation.

precisely the sort of incentive problems that preoccupy modern organizational economists. However, in a world in which agents do not share exactly the same models and do not know each others' models, a collective knowledge base is required for coordination. As simulation work, built on the theory of classifier systems, demonstrate, such a knowledge base – a Penrosian image – may develop as a result of organizational learning under rather general assumptions (ibid.). Moreover, because of the role of chance and lock-in, firms will develop different knowledge bases for coordinating their stocks of distributed knowledge. This helps accounting for firm heterogeneity – or, if you like, differential capabilities –, and, to the extent that collective knowledge bases influence productive and transactional efficiency (which is more than likely), also helps accounting for differences in revealed competitive advantages.

However, while this puts some more conceptual meat on the skeleton of “knowledge-based assets” often encountered in the resource-based literature on the firm, it does not say anything directly about the firm-market boundary. In other words, why is it that sometimes markets can coordinate distributed knowledge and sometimes firm organization is necessary? The answer may turn on differences in the histories of emergence of collective knowledge bases, which, I have suggested help us understand the phenomenon of differential capabilities. Thus, if capabilities are “dis-similar”, in the Penrose-inspired terminology of George Richardson (1972), it is because they are supported by different underlying collective knowledge bases, including managerial images.

In Richardson's terminology, production can be broken down into various stages or *activities*. Some activities are *similar*, in that they draw on the same general capabilities. Activities can also be *complementary* in that they are connected in the chain of production and therefore need to be coordinated with one another. Juxtaposing different degrees of similarity against different degrees of complementarity produces a matrix that maps different types of economic

organization. For example, closely complementary and similar activities may be best undertaken under unified governance.

Richardson's insight is a simple but extremely profound one. For it suggests that – as a quite general matter – capabilities are determinants of the boundaries of the firm. Problems of economic organization may crucially reflect the possibility that a firm may control production knowledge that is, in important dimensions, strongly different from what others control. Thus, the management team of one firm may quite literally not understand what the management team of another firm wants from them (for example, in supplier contracts) or is offering them (for example, in license contracts). Their respective Penrosian images are not overlapping, as it were. 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.³¹

Note that these dynamic transaction costs, as they have been called by Richard Langlois (1992), are in a different category from the transaction costs usually considered in the post-Coase literature. They have a cognitive dimension that is not encountered in that literature. Langlois and Robertson (1995) build a broad theory of industrial dynamics around the idea of dynamic transaction costs. The organizational question is whether new capabilities are best acquired through the market, through internal learning, or through some hybrid organizational form. Langlois and Robertson argue that the answer will depend on (A) the already-existing structure of capabilities (does a reconfiguration of capabilities require vertical integration or rather the supersession of existing vertically integrated firms by more market-like forms?) and (B) the nature of the economic change involved (is the relevant innovations autonomous or systemic?).

³¹ One is reminded of the, possibly apochryphical, story about the Japanese supplier firm, committed to total quality, zero defects managements, that unable to make sense of a requirement from its American buyer of 95 % defect free deliveries sent a separately boxed batch of 5 % deliberately broken parts and a note saying “We don't know why you want these”.

The upshot of all this is that an analysis of organizational cognition, for example, along the lines pioneered by Edith Penrose and founded on the idea of the image, may provide an alternative to existing contractual theories of the boundaries of the firm. Moreover, it may strengthen the capabilities theory on this subject (Foss 1993; Langlois and Robertson 1995; Hodgson 1996; Langlois and Foss 1997), which has merely started from the empirical generalization that firms control different production and organization knowledge, without fundamentally inquiring into the reasons for such differences. It is noteworthy in this connection that Penrose herself explained that many of her ideas about diversification were “equally applicable to vertical diversification” (1959: 145). As she pointed out,

... backward integration may appear profitable because the firm believes it can produce some of its requirements so much more cheaply than it can obtain them in the market that the reduction in costs adds more to total profits than any alternative use of resources ... Or a firm may have special productive advantages which enable it to produce at exceptionally low cost (1959: 148).

The import of such comments is, of course, that the make-or-buy decision may turn on considerations of production costs (rather than transaction costs), or, what comes to the same thing, on differential capabilities. Thus, among Penrose’s many achievements is also that of anticipating the capabilities theory of the boundaries of the firm.

IV. Conclusion

This paper has had a related twin theme: First, to argue that the literature has not done justice to Edith Penrose’s 1959 classic *The Theory of the Growth of the Firm* and, second, to argue that there still much to learn from this contribution. Of course, the two themes are closely related, since purportedly Penrosian

contributions have mostly neglected Penrose's emphasis on endogenous resource creation, on shared, firm-specific knowledge and on the firm as an entrepreneurial entity in an uncertain world that organizes a process of creating real options, and these are still themes where very little progress has been done in the context of the theory of the firm. Thus, this paper should be read as a case for re-opening the research program that Edith Penrose suggested in *The Theory of the Growth of the Firm*.

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