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THE THEORY OF THE FIRM, THE THEORY OF COMPETITION,
AND THE TRANSNATIONAL CORPORATION

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ABSTRACT

The Theory of the Firm, The Theory of Competition,
and The Transnational Corporation (TNC)

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Coase's 1937 paper on "The Nature of the Firm" formed the basis of the transaction-cost and internalization theories of transnational enterprises in the 1970s-1990s. These emphasized the problem of firms transferring intangible assets across national borders. Newer theories of the firm adopt resource-based Penrosian, knowledge-based, capabilities and evolutionary perspectives, yet most continue to explain the international firm as a function of transaction-cost economizing. It is argued that Coase's intention was to present a theory of the firm abstracted from its competitive environment. The application of this approach to a theory of the TNC is flawed because it cannot explain the TNC without reference to competitive conditions. This leaves us with incomplete theories of multinational firms in their competitive environments, because they address transaction-cost problems and solutions to the exclusion of many other competitive considerations that must influence the transnational step in the firm's evolution. The newer knowledge-based theories of the firm represent progress because they focus on the institutional details of dynamic firm creation of (investment in) the intangible or knowledge-based competitive assets by which firms transform their environments. For international firms, this has global consequences. Most recently, theory has begun to emphasize the advantages and not just the costs of internationalization. Additionally, the necessity to address the juxtaposition of internalization and externalization by global firms provides a context for creating a dynamic explanation of both. The key is to recognize the process of standardization as a part of the process of innovation at the heart of learning-based theories. This can help to explain the hierarchical division of labor both within and between firms.

DRAFT

The Theory of the Firm, The Theory of Competition, and The Transnational Corporation

The theory of the firmⁱ, whether based on transaction-cost or on evolutionary and knowledge-based analysis, has provided the basis for constructing most of the theoretical treatments of the transnational corporation (TNC)ⁱⁱ since at least 1960. This practice has had the result too often of focusing attention on a narrow set of parameters for defining and explaining the international firm. The parameters examined usually explain how global efficiency is improved through the international firm's ownership and direction of productive assets in more than one country. Both transactions-cost economics (TCE) and evolutionary theories of the firm have added immeasurably to the understanding of the multinational corporation, but the focus often excludes the analysis of business strategy and how firms compete to transform themselves and their environments in order to continue their productive operations successfully.

It is argued here that the theory of the firm initiated in Coase's 1937 paper was an attempt to explain the functions of a firm abstracted from its competitive environment. Coase's

explanation was based upon the comparative efficiencies of coordinating resource allocation within a private profit-seeking hierarchical institution or through markets.ⁱⁱⁱ When transaction-cost analysis was later extended to provide a theory of the TNC, especially during the 1950s to 1980s, Coase's methodology was largely adopted, but inappropriately, it is argued here. The evolutionary and knowledge-based theories of the firm that became more prominent in the 1980s to the present created a more complex and dynamic picture of the functions of the firm, but mostly retained transaction-cost reasoning to explain the TNC until very recently.

The purpose of this paper is not to deny that transaction costs can be one among many explanations for foreign direct investment (FDI). The development of the concept has provided a great service in contributing to the analysis of the TNC and in generating a large literature devoted to the organization and activities of the firm and the TNC. The view presented here is that transaction-cost-based theories provide an insufficient theoretical platform for explaining the multinational enterprise. The knowledge- or learning-based theories present a more fitting approach to the extent that they abandon the excessively narrow focus on the transaction costs of transferring knowledge assets to foreign productive operations.

Recent work places more emphasis on the advantages to be obtained by international production and less on its costs. A dynamic method that abandons the static, constrained-optimization approach emphasizes the extent to which firms' investments are undertaken to transform their environments, including any constraints such as transaction costs, but more broadly as well.

In the case of international production, this takes on global consequences. The need to address the simultaneous externalization of some productive operations and increasing concentration of resources inside global firms presents the opportunity to further develop the theory of competition by recognizing the process of standardization as a part of the process of innovation. It also highlights the necessity of focusing more attention on the TNC's control over resources outside its ownership boundaries through sub-contracting, outsourcing and other contractual arrangements. Finally, understanding the connection between internalization and externalization helps to further develop the nature of the hierarchical division of labor within and between firms, a topic mostly absent from the theory of the firm and the TNC.

The organization of this paper is as follows. Section I briefly recaps the methodology of Coase's 1937 theory of the firm. Sections II and III review the extension of Coase's theory

to analysis of the TNC by Hymer, Buckley & Casson, and Williamson. Section IV develops the methodological error at the heart of a transaction-cost-based theory of the TNC. Section V introduces the newer evolutionary, learning-based theories of the firm, most of which continue to explain the international firm as a product of transaction-cost economizing. More recent literature examining the advantages of internationalized production and the juxtaposition of internalization and externalization by global firms provides a context for creating a dynamic explanation of both. Concluding remarks appear in Section VI.

I. COASE

Ronald Coase's 1937 paper on "The Nature of the Firm" was widely acclaimed in the 1970s through the 1990s as an institutionalist theory of the firm to replace the unsatisfactory neoclassical model described variously as a "black box" or a production function.

Coase explained the firm as a superior institution for allocating productive resources when allocation through markets involves transaction costs. Thus, the cost of market transactions with other agents can be reduced by forming a private group of individuals whose productive exchanges within

the group are governed by hierarchical instead of arm's-length relations. The firm is said to "internalize" transactions that are more costly if arranged through markets. However, as the firm grows through internalization, the costs of organizing transactions within the firm rise. Therefore, the boundaries of the firm and the limit to firm size are determined by marginal analysis:

At the margin, the costs of organizing within the firm will be equal either to the costs of organizing in another firm or to the costs involved in leaving the transaction to be "organized" by the price mechanism. ...This gives the equilibrium for static analysis [404].

Although Coase is critical of the neoclassical approach to the firm, here he places analysis of the firm squarely within the static, constrained optimization methodology of neoclassical economics. This approach constitutes a theory of the firm abstracted from its competitive environment, since there could be any number of competitive reasons for a firm to extend its ownership boundaries, for example, the enlargement of its market share or exclusive control over scarce inputs. Thus, we have a theory of the firm created at a higher level of abstraction than a theory of competition. Application of this approach is widely adopted in the modern theory of multinational business.

III. TRANSACTION COSTS AND THE EARLY THEORY OF THE TNC: HYMER,
BUCKLEY AND CASSON

In the early post-World War II period, Stephen Hymer (1976)^{iv} and Charles Kindleberger (1969) fashioned an institutionalist treatment of the international firm that heavily influenced subsequent theory. It is worthwhile here to review briefly Hymer's framework, which was later split into the separate transactions-cost-economics (primarily associated with Oliver Williamson) and internalization (primarily associated with Buckley and Casson, and Dunning) approaches to the MNC.

The research questions posed by Hymer were: (1) How does a firm engage in foreign production successfully, given the assumed competitive advantages of local firms in the host country^v and (2) Why does a firm engage in foreign production instead of selling or licensing to a host-country firm the patent or technology or other asset underlying the final product it wishes to sell in the foreign country? Note that, in posing this second question, Hymer assumed that TNCs exist to transfer usually intangible assets to a foreign production location. This assumption has been maintained in most theories of the TNC, at least until very recently. Hymer's assumption was undoubtedly based on the observed transfer of new management techniques to

Europe by US multinationals during the post-World War II period. Typically, a manufacturing firm is assumed, although the same theories have been applied to FDI in services (Jones 2005: chapter 5).

Hymer's answer to the first question was that some firms had developed "advantages" vis-a-vis other firms that would act to offset the location advantages enjoyed by local firms in the host country. Such firm-specific advantages could include patents, better or cheaper access to important factors of production, brand names, economies of scale, and the like (Hymer 1976: 41-46). When these advantages were not easily acquired or imitated by local firms in the home or host country, the advantaged firm could profitably exploit its unique assets in a foreign country in competition with local firms. Such advantages became known as "ownership advantages" in Dunning's OLI paradigm (1993).^{vi}

Hymer's answer to the second question was that imperfections in markets lead firms in concentrated industries to engage in foreign production to achieve one or two goals primarily: (1) to remove competition among enterprises located in different countries, and/or (2) to appropriate the maximum possible rents which could accrue to the firm's unique assets.

In discussing why a firm wishing to maximize rents would choose foreign production over licensing, he referred to Coase's

theory of the firm, if not by name:

Why does a firm use the advantage itself instead of licensing it? ... The firm is a practical institutional device which substitutes for the market. The firm internalizes or supersedes the market. A fruitful approach to our problem is to ask why the market is an inferior method of exploiting the advantage; that is, we look at imperfections in the market [1976: 47-48].

For example, Hymer explained that uncertainty can lead to a "conflict of evaluations" between the owner of the advantage and the licensee:

The owner of the advantage may use it himself because his evaluation of it is different from the evaluation of other people because he has more information about his advantage [1976: 50]

Note that in Hymer's hands, Coase's methodology reappears, but the existence of the firm is now assumed, and the geographical extent of its boundaries is the focus. In addition to the problem of asymmetric information, Hymer explained that uncertainty makes it difficult to construct a contract that satisfactorily anticipates and makes provision for unforeseen events (1976: 50).

These examples anticipate the types of market failure giving rise to high contracting costs under transaction-cost-based theory developed in the 1970s. But Hymer did not limit his discussion of market imperfections to the problem of contracting costs. He also identified "imperfections" that could prevent the

advantaged firm from maximizing monopolistic/oligopolistic profits in a licensing situation:

The second problem of licensing arises from the difficulty of controlling price and output. To achieve maximum profits, a firm which licenses must specify the precise use to each firm, and this is not always possible under the antitrust laws. Alternatively, it could let the firms compete, but this may result in a loss of profits. If the firm which possesses the advantage does not license but instead undertakes the operations itself, there is less difficulty in achieving maximum profits [1976: 49].

Market imperfections here are defined from the point of view of the MNE, not from the perspective of economic efficiency. Hymer noted also that licensing could lead to a loss or accelerated loss of the licensor's advantage to the licensee. This danger could be forestalled by foregoing licensing in favor of foreign production. The key point here is that Hymer predicted "internalization" of international exchanges of intermediate knowledge-based products for the purpose of reducing contracting costs, as well as for maintaining monopolistic or oligopolistic advantages and maximizing rents on the basis of barriers to entry. Hymer's focus on the transfer of assets from an MNC to its international affiliates, i.e., "internalization" as opposed to a transfer of assets through a market interface, has remained the focus of the theoretical analysis of the TNC's primary function until very recently.

Hymer believed that the process of internationalization would lead to a smaller number of competing firms and thus a reduction in worldwide competition in the tradeoff between size of the firm and the number of firms. At the same time, he believed that TNCs present the possibility of greater efficiency in the global transfer of technology, capital and organizational skills (Hymer 1976: 221; Hymer 1970).^{vii} In other words, Hymer's explanation of international production combined efficiency-enhancing with efficiency-reducing factors. While Coase's influence is obvious, Hymer adds the competitive perspective of firms operating in oligopolistic industries. Thus, Hymer's theory of the TNC predicts that the extent of its geographic boundaries are affected by competitive considerations. This is not a theory of the TNC abstracted from its competitive environment. Coase's ideas are adopted, but Hymer assumes that competitive conditions, and thus strategy, help to explain the international firm.

Hymer's dual approach (efficiency-enhancing and efficiency-reducing) reappeared in Buckley and Casson's (1976) development of an internalization theory of the TNC, presented as a special case of the multi-plant firm. As in Hymer's work, the focus is on the geographical ownership boundaries of the firm. Buckley and Casson (B&C) did not mention "transaction costs," but

referred to market imperfections that generate benefits from extending common ownership over several "interdependent activities linked by flows of intermediate products . . .," crediting Coase (B&C 1976: 36, n. 2). B&C listed several types of imperfection (from the firm's perspective) that could be ameliorated by internalization, including (1) instances in which discriminatory pricing is not feasible (thus reducing possibilities for exploitation of market power); (2) bilateral concentration of market power; (3) asymmetric information regarding the nature or value of the product; and (4) barriers to trade or capital flows, and international variations in tax rates (pp. 37-38).

This attention to both efficiency and market power considerations has continued to the present in contemporary internalization theory (e.g., Kay 1999) and in the work of international-trade theorists who address the MNE. An example of the latter is Markusen (1995, 2002), who creates a model in which the advantaged firm becomes a multinational rather than a licensor when knowledge capital is easily appropriable by a licensee; the concern is with the loss of future rents from a proprietary-knowledge asset. (See also Horstmann and Markusen 1989.) The internalization theory of the international firm is thus influenced by Coase, but does not address the TNC abstracted

from its competitive environment.

III. WILLIAMSON'S TRANSACTION-COST ECONOMICS AND THE THEORY
OF THE TNC

Williamson's theoretical work on the international firm (1975, 1981, 1985) is built on his transaction-cost-economics-based explanation of the organization and boundaries of the M-form corporation.^{viii} As applied to the TNC, the internalization of cross-border transactions takes place most likely in order to reduce transaction costs related to exchanges of intermediate products (especially intangible assets) across borders, thereby raising global efficiency. Markets are the preferred method for transferring intangible assets to foreign locations, but costly market imperfections require the FDI approach. Williamson responds to Hymer's work by agreeing (1981: 1561) that the firm could choose internalization in order to restrain competition in addition to or instead of promoting transactional efficiency. But he argues that the efficiency reason is the more compelling explanation because of the tendency for international production to take place in industries experiencing rapid technological progress, and because the markets for transferring knowledge pose such difficult problems. He explicitly states that he has been dismayed by the popularity of the "antitrust" view that casts the

largest (including international) corporations in a negative light by assuming negative welfare consequences from their size and market share.

According to Williamson, markets for technology/knowledge are imperfect due to three problems: "recognition, disclosure, and team organization" (1981: 1562). His argument concentrates on the latter two. The problem with disclosure arises in the transfer of technology due to the information asymmetry also recognized by Hymer. The team organization problem arises when "new knowledge is diffusely distributed and is poorly defined":

Where the requisite information is distributed among a number of individuals all of whom understand their speciality in only a tacit, intuitive way, a simple contract to transfer the technology cannot be devised [1981: 1562].

The disclosure problem would probably require a profit-sharing arrangement with monitoring of costs and revenue, and perhaps monitoring of production. The disclosure and team organization problems present the additional difficulty of establishing procedures to govern joint work by personnel from two firms. If the contemplated transaction is of a recurring type, "complex contracting is apt to give way to direct foreign investment" (p. 1563). Therefore, the more complex or new the technology, the higher are the expected external transaction

costs, and the more likely is the TNC solution. The TNC is explained as a technological pioneer with efficiency-enhancing properties.

Williamson supports his explanation of the TNC by citing some evidence that international firms tend to transfer new technology through FDI, but use licensing and joint ventures to transfer older technology (1981: 1563, n.41; see also Hennart 1991: 88; Milberg 1998) However, this evidence would seem to be consistent with an oligopolistic competition explanation also. New technology is more likely to be the basis of current rent receipts and of the immediate competitive development of the firm (as developed in knowledge-based theories of the firm addressed below), and therefore is more important to guard from rivals.

Thus, Williamson's TCE-based theory of the multinational firm follows Coase more closely than those of Hymer and B&C. If the firm exists because it functions as a transaction-cost-minimizing institution, then the TNC exists to perform the same function across national borders. Williamson is certainly aware of competitive conditions that could influence firms' decision-making on many matters, including the choice of ownership of foreign productive assets. Therefore, it can only be concluded that his attempt here is to fashion a theory of the TNC abstracted from its competitive environment, emulating Coase's

1937 methodology of investigation of the firm in isolation from competition.

Williamson cautioned that "a transaction cost interpretation" should not necessarily be construed as a "fully adequate" treatment of the subject (1981: 1557). More recently, Williamson has suggested that TCE and evolutionary theories of the TNC be explored together. Nevertheless, until recently, Williamson's influential methodology has had the effect of focusing the MNE literature on transaction-cost-based explanations (Pitelis__).^{ix}

IV. THE THEORY OF THE FIRM, THE THEORY OF COMPETITION, AND THE TNC

Do we have a theory of the TNC abstracted from its competitive milieu? Do we have a theory of the TNC embedded in its competitive context? The argument here is that Hymer and Buckley & Casson offer the latter, essentially a theory of international competition carried on by oligopolistic firms with access to sufficient resources to contemplate ownership of foreign productive resources. Williamson attempts to offer the former, following Coase's methodology, but TCE alone cannot achieve this goal because it cannot explain the need or even

reason for a foreign production site.

As formulated, the transaction-cost-based theory of the TNC assumes that production in two countries is necessary, and then specifies the most likely form of the advantaged firm's involvement, i.e., licensing or FDI. But this theory does not explain why the firm with the knowledge asset cannot simply export the product embodying the technology (Ietto-Gillies 1992: 118). In other words, why must the asset be transferred at all?

As Brainard (1997) observes, the desire or necessity for internal exploitation of the firm's assets leads to the possibility of FDI *or of exports* from the home country, with the latter presenting the possibility for economies of scale.

In order to explain why foreign production is essential, resort must be made to strategic considerations with respect to location (Dunning 1998; Caves 1996: 2; Hennart 1991: 85), such as foreign laws, regulations or taxes (as recognized by B&C), or removal of foreign competition (recognized by Hymer), or advantages to be gained from the foreign location not available in the home country (Ietto-Gillies; Nolan), or any number of strategic reasons deriving from the firm's competitive stance in its industry and its access to resources. It is not sufficient to simply assume the existence of import barriers, especially since in recent decades, international trade barriers have been

falling while multinational production has been growing (Ietto-Gillies 2005:155; WIR 2005).

John Dunning, the creator of the "OLI eclectic paradigm,"^x laments that, in the TNC literature, location has become the "neglected factor." (Dunning 1998:45) He argues that, "given [the firm's] O[wnership] specific advantages, the critical choice of a multi-activity firm is whether it should internalize its intermediate product markets within its home country or in a foreign country ..." (Dunning 1998: 45). In fact, Brainard's (1997) empirical work finds that the ratio of firms' research and development expenditures to sales (an indication of technological intensity and the existence of technological intangible assets) explains exports slightly better than it explains foreign production. In other words, the choice of the location of production must be explained.

Again, Coase's transaction-cost theory of the firm is an attempt to explain why the firm exists, and the ownership boundaries of the firm (Conner 1991: 123; Coase 1937; Williamson 1981), based upon the relative costs of market and internal coordination of productive services. As such, it is treated in abstraction from the goals and activities of the firm in the context of its competitive environment. TCE theory, assuming the existence of the firm, nevertheless adopts Coase's methodology to

explain the ownership boundaries of the international firm. Like Coase, Williamson seems to treat the theory of the multinational firm in abstraction from its competitive environment. This methodology does not ask how the TNC acquired the asset or advantage that gives rise to the transfer problem, nor does it ask how the firm's exploitation of its asset will affect other firms in the industry and its own competitive stance in the industry (Dunning 1993: 81). Nor does it ask whether the firm's best competitive strategy against its rivals requires putting aside the problem of transaction costs in order to address another factor that will more effectively improve its overall competitive position (Cantwell 1991:25; Pessali 1999: 267). But surely these factors affect the choice of production location. Knickerbocker (1973) found a tendency for firms operating within a loose oligopoly to follow the industry leader, setting up foreign subsidiaries in locations pioneered by the leader firm. This was portrayed as a defensive competitive strategy, adopted in order to avoid losing out on any advantages the leader might receive or create in the new location, but probably not cost-effective, at least at the outset. Vernon (1993: 59) argues that defensive competitive reasons, and not necessarily cost-conscious ones, explain much of the international production that has taken place since the end of the Second World War.

When the firm's competitive environment and strategic considerations are introduced, the inquiry has shifted from a theory of the firm to a theory of competition. The difference between them is in the level of abstraction characteristic of each. Specifically, the theory of the firm is treated at a higher level of abstraction than is the theory of competition. The theory of the firm represents an attempt to explain the features of the firm that permit low-cost resource allocation, while putting aside the effects of the competitive environment. Therefore, introducing the location decision to explain the existence of the international firm (which of necessity introduces the panoply of strategic competitive considerations) takes the inquiry out of the realm of the theory of the firm, and into the realm of the theory of competition.

Cantwell (1991: 17) describes the difference between the two as emanating from two different levels of analysis: the mesoeconomic (focusing on the interaction between firms in an industry) and microeconomic (focusing on the individual firm). The point made here is that the latter cannot serve as a theory of the TNC without reference to the former, because it cannot explain when production should take place in the home or foreign location. Even if the location issue arises due to a non-strategic factor such as trade barriers, which could affect all

foreign firms equally, each firm's response will depend upon its competitive environment.

Once this broader competition question is introduced, it is clear that there are a number of reasons why a firm might choose international production, and that these reasons may have nothing to do with transaction costs, or may constitute considerations in addition to transaction costs. TCE purports to explain common ownership of internationally dispersed productive assets, but another possible explanation is that the firm establishes a foreign subsidiary instead of a contractual relationship with a foreign firm because it wants to maintain a monopoly on its knowledge assets for as long as possible in order to garner the maximum possible rents, as is recognized by Hymer, B&C, and in most versions of "internalization" theory. This motive for internalizing cross-border transactions is not based on coordination costs and is not necessarily consistent with improved efficiency.

The problem with TCE as a theory of the international firm is that it explains only what it assumes, i.e., that the firm's motive in establishing foreign production is to economize on the cost of transferring assets. By abstracting away from the factors that influence the decision about production location, Williamson attempts to explain the TNC on the basis of the

internal and external costs of coordinating resources only.

Once consideration of location factors has led to the determination that foreign production instead of domestic production will more readily secure the firm's goals, it is possible to consider whether TCE explains the appropriate form or mode of the firm's relationship to the foreign production endeavor, i.e., ownership, licensing, joint venture, or other contractual form. Here, TCE explains that, when the firm is to contribute costly-to-transfer assets to the foreign production, the method likely to economize on transaction costs is often FDI.

Yet there is a great deal of literature describing and explaining the recent growth of international joint ventures (Yan 1998) and international networks of cooperating firms (Mutinelli and Piscitello 1998; Belussi and Arcangeli 1998; Nolan; Ietto-Gillies). A number of motives have been put forth to explain these alliances, including risk-sharing, cost-sharing, the growing importance of inter-sectoral technology, the search for new products, penetration of markets, and organizational learning opportunities (Hagedoorn 1996: 601-605; Belussi and Arcangeli 1998), and not just the cost of the transfer of intangible assets. To the extent that firms choose these cooperative forms, it must be the case that the expected gains to the firm's competitive position from risk-sharing or learning or etc.

outweigh the expected gains from minimizing transaction costs via internalization.

That is, it is possible that firms choosing a cooperative form of international participation are pursuing goals other than the transfer of knowledge to a foreign production site, which is the goal analyzed by TCE analysis. If so, then TCE explains the choice of the form of international involvement only in circumstances where the nature of markets for the transfer of knowledge constitutes the most important factor. In other words, once again, TCE explains only what it assumes. It contributes consideration of a factor in the multinational decision that might have been overlooked before TCE was developed, but it alone does not explain the choice. The competitive position and goals of the firm, its access to resources and its strategies, and the managers' perceptions of these factors, do. TCE provides one explanation among many for international production as is recognized in internalization theory. It cannot stand alone as a theory of the TNC.

In the discussion so far, TCE explains the TNC only given that the state of competition and the firm's resources require foreign production instead of export, and given that the ability to minimize transaction costs is the most important issue in the decision about how to exploit its assets in other countries. Yet

even this limited role for TCE is overstated, once a dynamic concept of competition is introduced.

V. Knowledge-based theories of the firm combined with transaction-cost theory of the TNC

Hymer, Buckley & Casson, and Williamson crafted theories of the TNC that were very influential in the 1970s, 1980s and into the 1990s. The 1990s and 2000s have marked the arrival of a new genre of theories aiming to augment or displace TCE and internalization theories of the firm and the TNC. The newer theories include the resource-based view (RBV) (Kay), the competencies approach to both the firm and the TNC (Hodgson; Prahalad and Hamel), the evolutionary or knowledge-based theory of the TNC (Kogut and Zander), the theory of foreign technological accumulation (Cantwell), the theory of the innovative enterprise (Lazonick), and the theory of the TNC as a master of multiple national "regulatory regimes" (Ietto-Gillies).

For the most part, however, the knowledge theories of the firm leave intact the transaction-cost theory of the TNC. This approach isn't really challenged until very recently (see Ietto-Gillies 2005; Nolan et al. 2002, both discussed below).^{xi}

By focusing on the internal impetus to firm growth based on the firm's resources and ongoing collective learning, the

knowledge-based theories challenge a fundamental assumption underlying the theories relying on coordination costs: the assumption that markets are the preferred venue for transferring knowledge assets except for the costs associated with inter-firm relationships. Treating knowledge assets as a strategic, competitive advantage in the fight for market share is ignored by the TCE-based theory because it ignores the creation of the ownership advantage: Where did it come from? Or how was it developed? WHAT DOES THE FIRM DO? What do TNCs do? (Hodgson, 1998:188; KZ 1993:638; B&C 1976:69) In addition to allocating resources, they produce and sell goods and services and compete in order to be able to continue to do so on a remunerative basis.

In the newer theories, firm and MNE advantages are the results from past investments in R&D, in the creation of an integrated team of skilled individuals, the creation of an information transmission network within the organization, and the like. The newer approaches have, not coincidentally, coincided with a new appreciation of Edith Penrose's (1959) work on the internal impetus to growth of the firm. Her book had introduced cumulative, collective learning within the firm as an essential driver of the expansion of the firm and the path-dependent direction of expansion, including foreign production.

The literature on competition on the basis of knowledge

assets identifies these assets not only as inputs into final products, but as the fundamental means of competition for the firm (Navaretti et al. 2004; Ietto-Gillies 2002; Cantwell 1989; Conner 1991). That is, the ability to produce knowledge, and to continue that ability into the future, is treated as a competitive advantage and strategy of the firm. This implies that knowledge assets are more likely to be exploited within the firm and not for sale, even if markets could deliver full rents and minimize transaction costs to the owners of the assets. This is because internal development of know-how provides the means for developing knowledge assets in the future, and therefore secures a basis for successful competition in the future. Edith Penrose's work on the growth of the firm emphasizes the development or evolution of the firm as it grows, within its competitive context. This takes place on the basis of the special talents developed by the firm's personnel in the process of working with the firm's physical assets. As Penrose emphasized, the acquisition of new knowledge or know-how opens new possibilities that didn't exist or weren't recognized in an earlier period. The introduction of these dynamic competition concerns could explain Williamson's (1981: 1563, n.41) and Hennart's (1991: 88) observations, noted above, that new technology tends to be transferred through a foreign subsidiary,

while older technology is transferred via licensing or joint venture. In the new approach to technological competition, the transaction cost problem is irrelevant or secondary to the goal of maintaining privileged access to unique competitive assets for further development.^{xii}

When considering knowledge-based competition, it is useful to think of the firm as a producer of joint products: the final product which it sells, and the learning or knowledge asset developed along with the final product that makes the product competitive against the products of rival firms and creates new competitive opportunities. The knowledge product is not developed for sale, but for internal use, preparing the firm for the next stage of competition. The firm is thus an evolving entity, reproducing itself from one period to the next, but enhanced or changed by the learning-cum-production of the previous period. E. H. Chamberlin criticized the focus of IO economics of the 1950s-1960s on the industry as the unit of analysis, arguing that the "product" is constantly changing, making industry an inchoate concept (Ekelund and Hebert 1990). By extension, the plasticity of Chamberlin's concept of the "product" implies that the firm that is changing or developing its product is simultaneously changing itself.

This dynamic competition approach challenges the assumption

at the heart of TCE/internalization theory that markets would be the preferred route for international transfer of assets but for market imperfections. (Navaretti et al. 2004; Ietto-Gillies 2002). The function of the firm is to produce new unique collective knowledge that is difficult to copy and embodied in new products, processes, or new organizational routines, as the basis for competition and survival. Hierarchy is not the only institutional difference between the firm and the market, nor is it the most important. The focus switches from the transfer of knowledge assets to the production of knowledge assets.

Although Penrose's theory took into account both internal and external factors explaining the growth of the firm, the contribution that most influenced the knowledge-based theories was her explanation of the internal drivers of growth. To Penrose, the firm is a "bundle of resources" (____) consisting of human beings and physical assets that provide productive services. She argues that, since the interaction of the firm's personnel with their capital equipment and materials over time leads to the production of new knowledge, understanding, and capabilities, this process in effect creates new unused services that can be obtained from existing resources, and can be put to profitable use. But Penrose does not focus exclusively on the internal firm processes. Rather, these internal developments

color management's view regarding external opportunities, and vice versa. This leads to new endeavors, and acquisition of additional resources as needed to pursue these new endeavors, eventually taking the firm into product and/or geographical diversification based upon the collective, cumulative learning taking place. In Penrose, international production is an inevitable part of the growth of the firm that has mastered a competitive knowledge-based evolutionary path. Some of the Penrose-inspired theory of the firm and TNC is reviewed briefly below.

(A) The resource-based view (RBV) of the firm has emerged as a potential alternative to the internalization/transaction-cost theories (Pitelis, et al. 2000). Like Penrose's work, it emphasizes the firm's activities as a path-dependent or path-influenced process of creation of knowledge based on the characteristics of the firm's initial bundle of resources. (Wernerfelt 1984; Kay 2000). Kay (2000) suggests that RBV can be used to create a theory of the TNC^{xiii} by weaving RBV with internalization theory. Like Penrose, he treats the MNE as a bundle of resources, and groups these resources as intangible assets that the firm may possess in (1) marketing, (2) production, (3) R&D, and (4) home country-

based knowledge. He suggests that it is the strength or weakness an individual firm has in these areas that will determine the direction of new activities. The direction of expansion is defined as a choice among (a) further product specialization, (b) product diversification, or (c) selling abroad. In this approach, the richest resource linkages between the firm and its new activity are to be found in domestic expansion, based either on further specialization or diversification, since all four categories of intangible assets may be exploited more intensively. Exporting is less desirable since the firm's expertise in production and R&D only could be exploited. Presumably, its marketing and home country-based knowledge would not be useful. Therefore, exporting is desirable only if there are limits to domestic expansion, such as market saturation or antitrust regulatory difficulties. The internationalization option is the least desirable, since the firm's production assets could not be exploited, although its R&D advantages could. Kay does not elaborate the factors that determine the choice between export and FDI. He concludes that the RBV approach shows that multinational expansion is a solution deriving from a "weakened" home position for a firm that has no further

opportunities for domestic resource linkages. And the firm has no justification for international expansion without strong research-based assets (151).

According to Kay, once foreign production is chosen as the appropriate direction of expansion, the assumption of ownership of the foreign assets is dropped, and the question of the mode of expansion arises. That is, the firm may also consider cooperative modes such as subcontracting, licensing, joint venture or franchise. Here, says Kay,

we have a ready-made tool kit for analyzing mode in the industrial organization literature, namely *transaction cost economics*... This framework expresses choice of mode in comparative institutional terms and considers the *efficiency* implications of alternative market and organizational arrangements." (154)(emphasis supplied)

Thus, Kay embraces the coordination cost/efficiency approach to explain the internationalization step, and portrays this step as a last resort. Kay adopts the broader approach to coordination costs found in the internalization literature, including appropriability issues, and concludes that both RBV and some form of internalization analysis are necessary to adequately analyze the expansion decision; RBV determines direction, and internalization analysis determines mode.

Kay is clearly not trying to fashion a theory of the MNE abstracted from its competitive environment. His RBV approach considers competitive factors with respect to direction of

expansion, and his broad internalization approach includes appropriability issues. Therefore, on the question of why a firm OWNS foreign productive assets, which is the question that must be answered, Kay considers interfirm coordination costs. The possibility that a host of other competitive/strategic issues may impact the mode choice, such as access to technology or methods or products, or risk-spreading or geographic location of rivals is not recognized. Kay's theory of the TNC within its competitive environment inexplicably gives pride of place among the determinants of FDI to coordination costs and the goal of efficiency with respect to this narrow category. By focusing too intently on Penrose's treatment of internal forces for expansion, Kay ignores the possibility of acquiring resources or other competitive advantages from another location.

(B) The evolutionary^{xiv} theory of the TNC by Kogut and Zander (K&Z 1993, 2003) is critical of the importance assumed by transaction-cost/internalization approaches in the theory of the firm and the TNC. K&Z variously refer to their work as a theory of the firm, theory of the growth of the firm, and a theory of the TNC. They critique RBV and internalization theories; nevertheless, they combine some evolutionary and Penrosian resource-based ideas with an internalization approach.

K&Z portray the firm as a social community assembled in

order to create and transform tacit collective knowledge into profitable goods and services. The firm develops routines, codes and know-how in order to do so efficiently (631). K&Z argue (2003:10) that the firm's advantage over the market does not involve transaction costs, but is composed of employee identification with the social group which enhances coordination, communication, and learning. They distinguish their approach from RBV by criticizing the latter's "excessively" inward focus on the likely direction of expansion, arguing that the evolution of resources will always be influenced by the external forces of market competition.

For K&Z, the understanding and cooperation elicited from the firm's personnel by identification with this social community creates the competitive or ownership advantages or capabilities secured by the firm. These capabilities, of different strengths in different firms, make transfers within the firm less costly than interfirm transfers, due to investments in "codifying and teaching complex knowledge to recipients..." (630). The MNC appears due to its superior efficiency vis-a-vis other firms in the (internalized) transfer and recombination of tacit knowledge across national borders (K&Z 1993: 625-27). K&Z challenge the frequent assumption in the transaction-cost literature that there is a public good aspect of knowledge: i.e., that it can be

transferred at zero marginal cost, but hard to protect, such that market failure requires internalization (see, e.g. B&C: 628). Thus, their criticism of the B&C internalization approach is that all firms do not face the same transaction costs. Furthermore, the issue created by the existence of transaction costs is not primarily the problem of choosing a governance mechanism (market vs. firm), but the different capabilities of individual firms for achieving routinized communication of difficult-to-transfer knowledge. Therefore, the mode of transfer of knowledge, whether internal or external to the firm, depends on the unique capabilities created by each firm.^{xv}

This resembles an internalization approach, adding the recognition of different transaction costs facing individual firms based on their past investments and performances, and rejecting the Williamson emphasis on market failure and contracting problems. K&Z provide a more detailed behavioral focus on production, i.e., transferring and transforming collective, tacit knowledge into profitable products and services. The transfer of knowledge in this view is part of a stage of production in which ideas are made accessible to members of a group that will transform them into products. Firms that are more efficient at this become MNEs because they are most likely to be able to do the same across national borders. But

WHY can't they export? WHY do they have to locate production in the foreign market?

K&Z go beyond the problems involved with asset transfer, and embrace a more holistic approach by, like Penrose, emphasizing that the firm's problem is not just to transfer knowledge, but to use it as its platform for the creation of future advantages and expansion, i.e., as the basis for competition. Further, as K&Z develop this point, they begin to refer to the role of the two-way transfer of information that can result from opening operations in a foreign country, and thus open the discussion to a recognition too rare in the economics literature that FDI can take place in order to *acquire* advantages, and not just to transfer them from the parent firm. According to K&Z, the acquisition and recombination of knowledge to create future competitive possibilities are less likely if the firm relies on licensing instead of foreign production (640). Here, a reason for foreign production is introduced, although it is not clear why the acquisition of knowledge from abroad requires a production presence in a foreign country. Implicitly, production-specific learning-by-doing is suggested.

K&Z essentially present a theory of firm growth and development (like Penrose); when the firm arrives at the international step, which is assumed to be a negative function of

the attractiveness of domestic opportunities, it internalizes foreign production in order to transfer tacit assets to the foreign country and/or to acquire new capabilities. But the other possible competitive reasons for international production are ignored.

(C) Lazonick's theory of the social conditions of innovative enterprise (SCIE) (2003; 2002) presents a theory of firm development that emulates, criticizes and extends Penrose's work, but does not address the multinational firm. Nevertheless, it is the approach to the firm that most successfully rejects transaction cost economics and the static, constrained optimization methodology underlying TCE. Lazonick's innovative firm does not passively respond to external constraints such as transaction costs. Instead, it acquires financial commitment to a process of innovation with an uncertain outcome in order to transform products, markets and technological and other "conditions that might otherwise impose constraints on its ability to generate higher quality, lower cost products." (2002: 251)

[T]he transaction-cost approach...ultimately relies on exogenously determined "sunk costs" - Williamson's "asset specificity" - to explain the scale and scope of the modern industrial enterprise. ...Instead of viewing the firm's assets as exogenously determined, a theory of innovative enterprise analyses them as strategic investment. (P. 250)

But Lazonick's criticism (and others', e.g. Nolan et al. 2002) make clear the fundamental limitations of the constrained optimization/comparative statics approach adopted by most of the extant theories. For Lazonick, Schumpeterian innovation leading to transformation of the firm's environment is the essence of competition. Innovation creates an evolutionary development of the competitive environment, so that specific competitive challenges change over time. By recognizing that the development of firm competitive assets transforms its environment, he more successfully converts the knowledge-based approach into a dynamic theory of competition and firm development over time.

The social conditions necessary to accomplish innovation, according to Lazonick, are organizational integration, financial commitment, and strategic control. The organizational integration concept (similar to K&Z's emphasis on the necessity for the creation of commitment to the enterprise by individuals) recognizes the need for incentives for individuals to engage in collective learning that will enable transformative action. The financial commitment is necessary to finance the needed time for development, and strategic control is the power to allocate resources so as to achieve the firm's innovative goals. (p. 252) Like Penrose, Lazonick recognizes that the firm's cumulative

learning and development require not only the continual development of the firm's resources, but also the necessity for complementary investments in new resources. (p. 271) This means innovations or capabilities from outside the firm are added to the firm's cumulative knowledge development.^{xvi}

Penrose, Lazonick, and others have also recognized the "growing importance of strategic alliances and networks of firms in the innovation process," requiring an inquiry into "the organizational learning and economic performance of...inter-firm alliances." (271) Lazonick notes "large literatures on supplier relations and strategic alliances... demonstrate that innovation can occur through cooperation across legally independent firms as well as within a firm..." (2003: 56) With this recognition, it seems that the RBV and evolutionary approaches to the firm to date constitute only special cases of a broader knowledge approach to intra-firm and inter-firm structures of learning, competition and cooperation. This brings into question whether the long-standing focus on the ownership boundaries of the TNC is sufficient, given that the inquiry is about non-market institutional control over the allocation of some portion of global resources. Lazonick himself does not extend his analysis to the TNC.

(D) Nolan et al. (2002) and Ietto-Gillies (2002A, 2002B,

2005) address the TNC by abandoning the focus on the *transfer* of knowledge and transactions costs, and indeed on the theory of the firm, to introduce the idea that there are benefits deriving specifically from foreign operations. In addition they address the growing practice of externalization of previous firm functions, including outsourcing, sub-contracting, joint ventures, and the like. (See also Milberg 2004; Howells 1999) And finally, Ietto-Gillies reintroduces the subject of the hierarchical nature of the typical firm, a concept seemingly lost in the focus on the collective learning function of the firm.

Nolan et al. (and Milberg 2004) emphasize a "global business revolution," involving a few giant corporations "dominat[ing] each sector of the global economy." Their competitive advantages include sizable global market shares and globally recognized brands based on past investments. (Nolan 91-92) Thus Nolan places TNCs at the core of international oligopolistic competition for contested resources. Ietto-Gillies emphasizes the strategic advantages internationalization extends to the TNC, including the learned capability to manage assets across national "regulatory regimes," opening up possibilities for spreading risks, engaging in transfer pricing, threatening rivals, and gaining bargaining power relative to labor and home-country and host-country governments. Here, in effect, is the

internationalized version of Lazonick's innovative enterprise, transforming its environment across national boundaries. It is recognized specifically that the regulatory environment, and not just the economic and competitive environment, offers possibilities for transformation of constraints. National and supra-national governance institutions are therefore targets for TNC influence in the effort to control resources. This connection between TNCs and governance institutions is a concept acknowledged in the international political economy (IPE) and business literatures, but mostly absent from the economics-based theoretical TNC literature (with exceptions, such as Sugden ____). Yet, influence over regulatory policy extends the TNC's influence on resource allocation in a way not recognized in the theory of the firm, and with genuine economic consequences. The push to extend American intellectual property rights conventions around the globe is just one example (Perelman 2003; Doshi 2004); the broader effort to standardize international rules regarding trade and investment is another.

Nolan and Ietto-Gillies also recognize the ongoing externalization of many non-core firm functions, further destroying the coincidence of ownership boundaries with the power to influence resource allocation. One example is the Dell company, which "exercises considerable administrative control

over stages of production it does not own." (Langlois 2003: 376)

The literature is full of similar examples. (See, e.g., Howells 1999; Azoulay 2004) Nolan refers to the "external firm" as "the sphere over which conscious coordination of resource allocation takes place..."(101) While the focus on the "external firm" questions the amount of theoretical attention paid to ownership boundaries, this does not mean that there is no value in investigating the determinants of those boundaries. In fact, it is possible to explain the ownership boundaries, externalization, and the TNC's relationship with labor by focusing more closely on the process of standardization as a part of the process of innovation.

According to Nolan et al., externalization occurs because new information technology investments have made "super-increased" monitoring possible. Like Lazonick, Nolan emphasizes that firms have worked to transform their pre-existing constraints (transactions-related or otherwise). This renders ownership of some foreign productive activities an unnecessarily invested way to control economic activities in which they have an interest. Milberg (2004) has examined the pattern of vertical disintegration of production resulting from the outsourcing of supplier functions in sub-industries that utilize standardized technologies not core to the outsourcing firm. These sub-

industries are subject to vigorous competition and experience low profit margins. These conditions are likely to exist in productive activities utilizing relatively non-unique assets and standardized production methods, which are the source of the competitive and profit conditions.

Milberg emphasizes that firms retain ownership of unique assets/activities because of their rent-producing properties. Nolan focuses on the monitorability of outsourced functions. (See also Azoulay 2004; Howells 1999) The two are part of a continuum of innovatory activities. What renders a technology "standardized," and no longer unique and inimitable, no longer a source of rents, with more easily measured output quality? Introducing the dynamic element, the process of standardization is the process of refining know-how until the once tacit understanding involved becomes familiar, routine and accessible to many. This is the result of past investments made by firms to make the technology and its utilization more reliable, and therefore easier to manage, along with investments in new measurement tools. These investments contribute to the creation of new markets supplying functions not previously obtainable outside the firm's ownership boundaries. Externalization of standardized functions may be said to be due to low transaction costs in markets for easily measurable activities, but the

transaction costs are endogenously determined by firms' competitive investments in innovation and standardization. (see Milberg 2004:61; see also Langlois 2003) These principles can also help to explain the hierarchical division of labor within the firm that Ietto-Gillies re-introduces.

The cooperative learning approach to the firm seemed to have abandoned attention to the typical hierarchical nature of the firm until Ietto-Gillies cited the motive to subdue labor bargaining power as one driver of international production. Lazonick had also cautioned that the collective, developmental approach to the firm is typically limited to the managerial group, at least in the United States, except perhaps in narrow, skill-based industries such as information technology. In TNCs originating outside the U.S., the extent of the collective learning approach may vary.

The network literature suggests a method for characterizing the hierarchy of labor within the firm, and that is to employ the subjective judgment/measurement differentiation. Azoulay (2004) and Howells (1999) address the distinction between research labor within the firm and labor in outsourced research functions. Howells suggests a "core and periphery" workforce, with subcontracting for routine, standardized low value-added work, and in-house labor devoted to the firm's "critical" technology, i.e.,

labor whose performance requires appraisal or judgment since no objective measurements are available. (pp. 22-25) (Hodgson 1998 also emphasizes judgment.) Azoulay (2004) emphasizes the difference between easily monitorable tasks performed in "data sweatshops" by "data mules" and knowledge production: "the establishment of novel conceptual categories, hypotheses, and causal associations." (1591) The latter is harder to measure, resulting in subjective performance evaluations.

Extending these concepts to the division of labor within the firm, labor whose performance is judged, not measured, based on a variety of changing interrelated factors, is more likely to be a part of the learning/developing group. Labor whose performance is more easily measured using standardized tools and considered to be more easily replaceable is less likely to be in the development group because the firm invests relatively little firm-specific knowledge in this group. This is also the labor more likely to be outsourced if and when markets are created in the services provided by this labor. In other words, there may be within the firm a continuum of activities differentiable on the basis of the degree to which performance can be measured objectively. If and when activities are outsourced is a matter of technological and institutional development that results from

firms' competitive investments. Using the same analytical method to address the division of labor within and outside the firm's boundaries emphasizes the hierarchy that exists within both firms and markets.

VI. CONCLUSION: what do TNCs do?

What do (firms) TNCs do? They produce goods and services in more than one country for anticipated profitable remuneration. They compete in order to remove threats and enhance their capabilities for continuing to produce and sell, using innovation, the acquisition of appropriate finance and other resources and the securing of necessary supplies (which may or may not include a market interface). In this competitive process, they transform themselves, markets, the nature and location of production, and the environment, including political institutions and governance. The anticipation of remuneration or rents comes from branding and differentiated and somewhat inimitable knowledge or capabilities which can be developed and supplemented over time through the production, selling, and resource acquisition experience. The choice of location of production, and whether resources are owned or contracted, is a strategic issue, which of necessity changes with historical changes in firms, technology and the evolution of markets and the

competitive environment. Ietto-Gillies argues that the choice of network configurations, i.e., the network that includes the firm's owned assets and contracted assets, depends on "strategic objective, efficiency constraints and perceived scope for control." (2002B: 40; see also Lazonick on strategic control: 252) Some competitive methods may improve efficiency, but others will secure the basis for collecting rents by extending proprietary control.

The international scope brings access to unique foreign resources that may be folded into the firm's existing competitive advantages. It extends the reach of the TNC's control over a portion of global resources, thus limiting control by others with different goals, including rivals, governing bodies and labor. Ownership-based control is unlikely when the foreign assets are not unique enough to yield significant rents or would unduly raise risk by concentrating too many of the firm's resources on a single competitive opportunity. Here, subcontracting or outsourcing suffices to extend control over non-owned resources.

TCE focuses attention on a subset of competitive tools in unique circumstances. Knowledge-based theories, to the extent that they adopt transaction-cost reasoning to explain ownership of foreign production, are subject to the same problem.

Transaction costs are undoubtedly an important consideration, one

among many, with regard to multinational expansion.

The knowledge-based literature, when freed of the constraints of the TCE methodology, demonstrates more clearly that there are many possible reasons to operate internationally.

They add to the fleshing out of the institutional characteristics of the firm and the TNC and of the nature and process of competition. They are more likely to focus on the dynamic development of competitive advantages instead of simply the transfer of advantages. They are more likely to help to take analysis of the TNC out of the static, constrained-optimization methodology that draws attention away from the competitive activities that transform the global environment.

Endnotes

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ⁱ In the literature on this topic, no distinction is made between the firm and the specifically corporate form. I follow that practice here, noting the additional privileges accruing to the corporation due to limited liability and less costly access to finance.

ⁱⁱ I use the term TNC interchangeably with multinational corporation (MNC), multinational enterprise (MNE) and international firm, as is the usual practice.

ⁱⁱⁱ As Langlois (2003) notes, the distinction between markets and hierarchies

has become dated since 1937. The differences between firms and markets can not be characterized so starkly along the hierarchy dimension. This point is addressed in the conclusion of this paper.

^{iv}Hymer's 1960 dissertation was published in 1976.

^vSuccessful foreign production would entail learning costs with respect to a foreign culture, laws, regulation, and language, and local firms would have the advantage of already knowing how to conduct business in this environment (Hymer 1976: 28, 34).

^{vi} Dunning created a "framework" for understanding international production as a function of a firm's Ownership advantages (often intangible assets), Location advantages, and Internalization advantages.

^{vii}Hymer believed that integration of "previously remote markets" would improve the efficiency of global resource allocation (Hymer 1976: 221). Kindleberger (1969) developed this theme at more length (pp. 32, 187).

^{viii}Most of Williamson's (1981) article is devoted to the argument that the modern M-form of corporate organization evolved in order to minimize transaction costs that arise from circumstances characterized by bounded rationality and opportunism. He argues that the M-form made the TNC possible by reducing the information management burden at the planning/strategic level of the firm.

^{ix} A great deal of work on the TNC has focused on the so-called "hold-up" problem that could occur when a party to a contract makes investments in specialized assets that have little market value outside the contract. See Holmstrom 1998.

^xDunning has proposed the OLI paradigm to explain the level and pattern of international production. In each case, the firm instituting foreign production must possess an "Ownership" or

competitive advantage such as a patent; the country that provides the site must offer some "Location advantage," such as unique resources or an attractive market (requiring localized production); and the firm's advantage is of a type best exploited by "Internalizing" production within the firm. See, e.g., Dunning 1993: 81.

^{xi} An exception is John Cantwell's (1991) work on the theory of technological accumulation.

^{xii} Indeed, Waldman and Jensen (2001) note research showing that managers rank secrecy above patenting as the preferred method for maintaining this exclusive access.

^{xiii} He notes, however, that Penrose saw no need for a separate theory of the TNC since she saw geographical diversification as just one part of the firm diversification that accompanies growth.

The establishment of foreign subsidiaries or branches is, for the parent company, not essentially different from the establishment of subsidiaries or branches in its own country. To be sure, greater allowance for risk must be made,.... But the new expansion is part of the process of growth of the parent company.... (Kay 2000:144; Penrose 1956:225-26).

^{xiv} Kogut and Zander base their work on the evolutionary approach to the firm developed by Nelson and Winter (1982).

^{xv} It is not entirely clear how a firm without these capabilities can achieve better transfer results through market intermediation. Perhaps the default option is no transfer at all.

^{xvi} Lazonick updates Penrose by describing how the evolution of the US stock market over the last few decades and the role of stock options in corporate governance have destroyed the social conditions favoring organizational integration in the US that was typical of industrial enterprises when Penrose was writing her book. Lazonick recognizes the ability of firms based on "'narrow and concentrated' skill bases of highly educated and specialized personnel," such as the pharmaceutical industry, to achieve organizational integration. (p. 271)