Abstract: This paper examines the multinational firms from a coevolutionary lens. The coevolutionary process encompasses both macrocoevolution with the environment and microcoevolution among the parts and the whole. We show that environmental selection is dominant in macrocoevolution whereas microcoevolution is more at the management’s discretion, even when internal selection markets exist. The MNC’s coevolution leads to both causal ambiguity, which creates barriers to knowledge transfer, and absorptive capacity, which produces mixed effects on knowledge transfer. In this regard, fitness with the host environment enhances outward-looking absorptive capacity and helps increase the speed of macrocoevolution while fitness among the parts and the whole increases inward-looking absorptive capacity and helps increase the speed of microcoevolution. Managing the balance between the two is critical and can result in coevolutionary advantage and coevolutionary rents.
INTRODUCTION

Research on multinational firms has been fairly prominent over the past few decades. Although the primary thrust till the 70s was more on issues pertinent to international economics and trade, there was a marked shift in the 70s, especially after two landmark works by Dunning (1971) and Buckley and Casson (1976) on theories of the multinational enterprise. These scholars, along with others (Rugman 1981; Hennart 1982), were interested in particular in the organization of production within the MNC. This stream of work was guided broadly by two questions: (1) why does a firm go abroad, and (2) why does it do so through its own subsidiary (i.e. hierarchy) and not other more market-like mechanisms such as licensing? More recently, since the 90s, research on the management of the MNC has been largely influenced by yet another landmark work, namely ‘Managing across Borders’ by Bartlett and Ghoshal (1989), which investigated a select number of multinational firms through rich and detailed case analysis.

Although the earlier theories of the multinational enterprise have been insightful, in particular to explain the emergence of the multinational firm, they have tended to approach the issue at an institutional level, i.e. the multinational firm as an institution, and do not specifically engage with the phenomenon at the more specific firm level that tends to concern management scholars the most. At the same time however, although Bartlett and Ghoshal’s (1989) work, and the accompanying notion of the transnational corporation, has been among the most insightful investigations at the managerial level in recent years, yet, as pointedly mentioned by Zaheer (2002), the potential for this work to become integrated with mainstream research and scholarship has remained largely
unrealized, primarily due to weak connections with other theories or, in her terms, ‘missing bridges’.

In elaborating on these ‘bridges’, Zaheer contends that (1) the theoretical connections between the transnational organization and the literature on sustainable competitive advantage and, in particular, the resource based view have never been sufficiently articulated; (2) “few attempts have been made to link the transnational model to extant theories of knowledge creation and retention at different levels of analysis” (p. 77.), in particular studies addressing knowledge exploration and exploitation, or variation, selection and retention of organizational patterns and practices in MNEs (3) there have been few attempts to explicitly link the transnational framework to theories of the MNE; and (4) the interaction of location with organization is a critical issue but remains an area where greater conceptual clarity is needed.

To enunciate the point, while there have been some insightful investigations into the inner workings of MN firms, most notably Bartlett and Ghoshal (1989), their theoretical grounding as well as theoretical link to competitive advantage has tended to be weak (Zaheer 2002). Yet, strategic management theory is centrally concerned with more deeply understanding the very question of how firms differ and argues in particular that the source of such differences lies in firm capabilities.

In this paper, we apply the lens of coevolutionary theory to the analysis of multinational firms. The MNC provides an ideal arena for application of the coevolutionary perspective because of its unique organizational configuration of a set of subsidiaries located in a variety of distinct environments. The MNC is at one and the same time both one organization (among a population of organizations) and yet
constitutes a population of organizations (i.e. its subsidiaries). The subsidiaries simultaneously co-exist and compete with other firms/entities in their respective environments as well as with other subsidiaries within the MNC’s internal environment. Factors at both these levels impact the overall evolutionary trajectory of the MNC.

Coevolutionary theory has recently become more visible in the management literature (Lewin and Volberda 1999; Baum and Campbell). In contrast to the age-old debate in organization theory over whether environmental selection (Hannan and Freeman, 1977) or managerial adaptation (Child, 1972) is the primary driver shaping organizational evolution, coevolutionary theory (Lewin and Volberda, 1999; McKelvey, 1997; Baum, 1999) emphasizes that change is the joint outcome of both managerial adaptation and environmental selection and not of one or the other. The coevolutionary framework also contends that coevolution occurs at two different levels: macrocoevolution, representing coevolution between the firm and its environment, and microcoevolution, representing coevolution within the firm among its constituent parts (McKelvey, 1997; Baum, 1999).

In making our arguments, we distinguish between the coevolutionary process, coevolutionary capability and coevolutionary fitness. Broadly, in the context of MNCs, the coevolutionary process refers to the macrocoevolution that occurs between the MNC and the host environments, and the microcoevolution that occurs among the MNC subsidiaries and the subsidiaries and headquarters. This coevolutionary process occurs within a dynamic framework, one that includes the iteration of variation, selection, retention and transfer. Coevolutionary capabilities refer to the MNC management’s capabilities to manage the coevolutionary process. Coevolutionary “fitness” results both
from the coevolutionary capabilities at the macro and micro levels respectively as well as capabilities in meshing the two together. In this regard, this part (subsidiary) - whole (the MN system) coevolution is an important aspect of coevolutionary theory. Differences in coevolutionary capabilities and resultant fitness can differentiate MNCs from one another and can thus become an important explanatory of performance differences across MN firms.

As a logical extension of our arguments, an important, and hitherto unrecognized, source of competitive advantage lies in how firms manage the coevolutionary process, i.e. macro and micro coevolution. This can be considered to be the coevolutional advantage, that is ‘owned’ by the firm and ‘yields’ coevolutional rents, both in the local and global arena. Since the source of coevolutional rents is ‘fuzzy’, i.e. tacit, causally ambiguous, socially complex, etc, it can serve to be an important source of sustainable competitive advantage (Barney 1991).

The paper proceeds as follows. First we flesh out the concepts underlying macro and microcoevolution in MNCs. We then make the case for how and why the mechanisms of selection and adaptation operate and differ at the macro and micro levels, and additionally, why the speed of coevolution at the micro level is slower than that at the macro level. We also propose that the speed difference at different levels results in heterogeneity within the MNC, and absorptive capacity can balance the tension between the countervailing forces of heterogeneity and homogeneity. Finally, the basic implications of the argument for knowledge management, competitive advantage and the markets versus hierarchies debate are developed more fully.
THE MNC IN A COEVOLUTIONARY FRAMEWORK

The MNC provides us with a good opportunity for the analysis of the dual effects of macro and microcoevolution. In the context of the MNC, macrocoevolution refers to the coevolution between the different parts (i.e. subsidiaries and HQ) of the MNC and their respective external environments, and microcoevolution refers to the coevolution among the constituent parts within the MNC which occurs through the interaction of subsidiaries with each other and with headquarters. Scholars have tended to mainly examine coevolution at one level (Hannan and Freeman 1977) or the other (Burgelman 1984) but not both (Baum and Korn, 1999; March 1994). Yet, as we show, the evolutionary trajectory of the MNC is driven by the simultaneous interplay of microcoevolution and macrocoevolution, and the resultant influence on its knowledge generation, transfer and absorption capabilities. Environmental selection and managerial adaptation forces are present at both these levels.

Basically, the MNC is constantly changing at two levels. One is at the macro level where the MNC (and its parts) is an identifiable organization acquiring, exchanging and competing for resources with other organizations. The other is the more micro internal level, which involves the resource production, allocation and exchange process that occurs among the constituent units. Both levels change and evolve simultaneously and, taken together, result in a coevolutionary process.

The coevolutionary process

In this section, we examine the coevolutionary process, i.e. macrocoevolution and microcoevolution, more closely. We argue that coevolution at the two levels is independent of each other, that microcoevolution is nested within macrocoevolution and,
furthermore, that the speed of microcoevolution is slower than that of macrocoevolution.

I. Multilevel analysis

An important aspect of coevolutionary theory is multilevelness. Multilevel coevolutionary thinking requires us to consider the interaction between as well as within multiple levels. Although several researchers have applied this multilevelness concept (Van de Ven and Grazman 1999, Ingram and Roberts 1999, Rosenkopf and Nerkar 1999), questions still remain regarding the interrelationship between macro- and microcoevolution and the speed of macrocoevolution and microcoevolution processes, especially with regard to MNCs.

The multilevel distinction is especially suitable for the research of multinational corporations, which are united as a whole and compete for resources in various niches against other MNCs and domestic firms, and which at the same time are comprised of a set of subsidiaries that transfer internal resources such as information, knowledge, and managerial expertise. As strategy and international business research has moved from focusing on the headquarter ownership advantage (Buckley and Casson, 1976; Dunning, 1988) toward the subsidiary-level ownership advantage (Rugman and Verbeke, 2001; Birkinshaw and Hood, 1998), the multilevel framework has assumed particular significance. This is so since the creation and management of multinational firm advantage is a dynamic process that takes place within the multilevel coevolutionary context.

Broadly speaking, to encapsulate the argument, the evolution of the MNC can be analyzed by examining the coevolution of its constituents, i.e. the subsidiaries. Subsidiary evolution is a consequence of subsidiaries’ resource exchanges with their external host
environment and with the internal MNC environment. The MNC management’s capabilities to manage the coevolutionary process are important on two dimensions: to enable each subsidiary to survive and thrive in the local niche, and to maintain and enhance the cohesion and integrity of the MNC network.

Macrocoevolution

With respect to macrocoevolution, each subsidiary occupies a particular niche, for instance a geographic or product specialization (or both), both in the host environment and within the multinational firm. Some subsidiaries acquire knowledge from local environments or regional clusters (Birkinshaw and Hood, 2000), some subsidiaries come up with innovations tailored for the local market (Lord and Ranft, 2000), and yet others do both. By becoming a member in the host technological and social community, subsidiaries either come up with their own variations or watch the environmental dynamics and absorb the successful variations, thus enriching their own specialized knowledge stock and potentially that of the MNC as a whole.

As its local niche decays or expands due to processes operating at the environmental level, a subsidiary may find itself becoming more or less important to the MNC as it coevolves with the niche. Macrocoevolution is reflected by changes in subsidiaries in response to changes in their niche and by changes in the charters granted to them by HQ in response to such changes in both their environment and their capabilities. This combines both environmental selection as well as managerial adaptation. For instance, in the IT sector, if liberalization policies of the Government of India, both generally and with respect to IT, coupled with other factors such as a ready supply of IT-qualified engineers at reasonable wages, make India a much more pivotal
player in the global IT industry, and if the Indian affiliate is able to respond to this effectively, then the Indian affiliate of IT multinationals would (potentially) become more critical to the firm and would play a larger role in the firm’s IT strategy and operations worldwide.

Macrocoevolution would therefore be determined by location-specific advantages in a dynamic way. Macroevolutionary processes reflecting environmental selection pressures and the initiatives of local subsidiaries influence the resources available to the subsidiary and the capabilities of the subsidiary occupying that niche. MNCs that are better able to direct the macrocoevolutionary process, both through anticipation of the forces of environmental selection as well as managerial adaptation, will tend to create organizational structures and processes that allow subsidiaries to target and fit into expanding niches in the environment. This results in each subsidiary being unique and distinctive.

**P1:** Macrocoevolution results in a differentiated network.

*Microcoevolution*

Microcoevolution reflects the coevolution of intrafirm resources, capabilities and competencies (Lewin & Volberda, 1999). The parts of the MNC coevolve with the whole (Baum, 1999), transforming each other. Depending on the particular set of resources at hand, the locus of competitive advantage constantly shifts among the subsidiaries, and between the subsidiaries and the headquarters. The roles of subsidiaries change in a dynamic way from recipients of the MNC knowledge stock to senders of knowledge, and vice versa, depending upon the relative and relevant knowledge stock of each unit.
At the micro level, coevolution within the MNC leads to changes in roles assumed by its constituents (subsidiaries) in terms of sender or recipient, as well as concomitant changes in various routines, systems, mechanisms, etc that support this process. Part of this microcoevolutionary process occurs through managerial adaptation as a result of interaction among the constituent parts of the firm, especially with respect to knowledge assets and routines that are created, diffused, absorbed, transformed and deployed over time. Even if something is mandated by HQ across the board, different subsidiaries tend to adopt and adapt it in different ways (Kostova). The other part is driven by the natural selection of certain routines/capabilities over others because they are easier to absorb or simply work better. [It could also be due to their inimitability by competitors.] At the micro level, a critical role of the management within the MNC is to coordinate the internal resource and knowledge flows, a process which involves both the selection and adaptation of routines, resources and capabilities within the firm. This coordination within the social community of the MNC maintains the identity and integrity of the MNC.

**P2:** Microcoevolution enables the differentiated network to maintain a common and cohesive identity.

As the multinational corporation is transformed by both macro and micro coevolutionary processes, these processes drive the developmental trajectory of the firm’s knowledge and capabilities. Macrocoevolution, driven by environmental selection of specific technologies and geographic niches as well as by managerial adaptation through change in subsidiary charters, roles and initiatives, dictates the configuration and scope of the multinational firm. Microcoevolution, due to managerial adaptation of organizational structure and processes, and due to natural selection of routines that enhance knowledge
transfer and absorption, determines the firm’s ability to manage the configuration and scope. In this process, the role played by each subsidiary is partly determined by environmental selection—the external value ascribed to the knowledge stock of the subsidiary (by both local and internal MNC environments)---and partly by managerial adaptation through attempts to align the subsidiary’s trajectory so that it meshes with its host environment and with other parts of the MNC. Thus, the evolution of firm knowledge and capabilities as a whole is a joint outcome of the macro and microcoevolutionary processes. The firm’s ability to manage subsidiaries in a macrocoevolutionary way, reflecting their ebb and flow with respect to their respective niches, cemented with the ability to manage them in a microcoevolutionary way so that the entire firm benefits from various subsidiary initiatives can be a distinctive feature underlining firm advantage. (coevolutionary advantage)

**P3:** Macro and micro coevolution jointly influence competitive advantage.

The following two sections argue that microcoevolution is nested within macrocoevolution and that macrocoevolution happens at a faster speed than the microcoevolution.

II. Nested Relationship.

Microcoevolution is nested within macrocoevolution. That is, microcoevolutionary mechanisms emerge within the context of macrocoevolution (McKelvey, 1997) and are set up under the principle of facilitating the attainment of the macrocoevolutionary fitness. Basically, at the external macro level, firms compete against each other with their products and services. The environment selects firms through the selection of specific products, innovations and technologies. At the micro
level, however, the target of selection is not so much the end product but, rather, the internal routines and organizational processes that can best facilitate microcoevolution. As a result of the difference in the target of selection, the environment selection forces at the macro level, i.e., at the interface between the environment and the MNC, are stronger than the managerial adaptation forces, in that the firm has more direct control over managerial adaptation---for instance, enabling strategic initiatives at the local level, changing charters or granting greater autonomy---than over environmental selection.

The situation is the reverse at the micro level, in that the internal selection pressures at the microcoevolution level are part of managerial adaptation efforts at the macrocoevolutionary level. To illustrate, Burgelman (1994) found in his study that the internal selection mechanisms, which mimicked the market mechanisms and allocated the manufacturing resources according to sales margins, played the key role in the evolution of Intel from a DRAM memory company to a microprocessor company. Therefore, internal selection rules were based on the forces of environmental selection. Yet, it is the management that internally selects among competing product initiatives, talents, routines and structures. Management has more direct control over internal selection procedures and so the environmental selection forces exert their influence only indirectly. This argument applies not just to hierachical flows but also to lateral flows across subsidiaries.

To sum up, the coevolutionary process is characterized by the differential impact of adaptation and selection at different levels.

**P4**: Although adaptation and selection have an effect on both macro and micro coevolution, selection dominates the macrocoevolutionary process, while adaptation (through ‘faked’ selection) drives microcoevolution.
Greater capabilities of management to determine the relationship between microlevel internal selection and macrolevel environmental selection increases the accuracy with which the internal selection would match the ebbs and flows in the external selection and the likelihood that the firm as a whole would achieve the coevolutionary “fitness”.

III. Speed differential between macrocoevolution and microcoevolution

As mentioned, a significant difference between microcoevolution and macroevolution is the difference of what is being selected at the two different levels. The difference in the object of selection---products, innovations, etc. that best facilitate macrocoevolution on one hand and routines, structures, processes that best facilitate microcoevolution on the other---has implications for speed of selection and, logically from this, speed differences between macro and microcoevolution.

Hannan and Freeman (1984:156) argue that organizational evolution is hierarchical, because organizations evolve at different levels---the core and the peripheral level---and organizational entities at different levels respond to the environment at different speeds. Certain aspects of organizations---such as goals, forms of authority, core technology and marketing strategy---comprise the core set and face less intense selection pressures as well as are characterized by greater inertia than the peripheral set---such as products and services---which represents more specific exchanges with the environment (Hannan and Freeman 1984).

In other words, the pressures and proclivities for adaptation differ at different levels of an organization. Bounded by weaker (non-market) forces, peripheral entities, which are final manifestations of core ones, evolve faster than the latter. That is, products
are more vigorously selected than the underlying capabilities, routines and structures that support them. The environment may directly select a specific product or service, but cannot select the mindsets, routines, structures, and knowledge transmission channels and mechanisms (Gupta and Govindarajan, 2000) that provide the support structure and determine, for instance, how fast and accurately the selected knowledge can be transferred. The latter lies more in the domain of the management than of the market.

Putting it differently, at the macro-level, the external environmental selection forces (on product/technology variations) are more direct. In contrast, for reasons to do with bounded rationality, managerial slack, path-dependence, sequential decision making, etc (Cyert and March 1963), the internal selection pressures, for instance on the routine or organizational structure variations, are not as accurate or intense. Basically, in comparison with external selection that is market-driven and constantly changing, internal selection is slower. The phenomenon of weaker selection pressures at the micro level than at the macro level has important implications for coevolutionary fitness.

**P5:** Differences in environmental selection mechanisms result in greater speed of macrocoevolution than microcoevolution. A large margin between the two can negatively impact overall coevolutionary fitness.

**Coevolutionary capabilities**

Coevolutionary capabilities emerge from the successful management of the challenges that arise in the coevolutionary process. Two prominent challenges in particular, especially in the management of an internal knowledge market, are the causal ambiguity and absorptive capacity that enable or bottleneck the knowledge creation, transfer and absorption process. The MNC management’s capabilities to manage these two aspects, which are central to coevolution, become critical to the MNC’s success.
Causal Ambiguity as a Coevolutionary Outcome

Causal ambiguity is defined as the “basic ambiguity concerning the nature of the causal connections between actions and results” (Lippman and Rumelt, 1982:420). Reed and DeFillippi (1990) expand on three antecedents of causal ambiguity—tacitness, complexity, and specificity—which can lead to competitive advantages. Causal ambiguity impedes the knowledge transfer process since, when the causal connections in the knowledge are ambiguous, the effectiveness and usefulness of the knowledge transferred are undermined.

From a macrocoevolutionary perspective, activities aimed at generating locally fit knowledge can result in causal ambiguity. Created in different environments and targeted at specific purposes, knowledge is frequently embedded in local social and technological environments (Bartholomew 1997, Porter 1990). For example, a subsidiary may collaborate with some universities or research institutions in the host environment. Social and technical elements unique to the host environment are incorporated into the final products and technologies. Since actors in the particular host environment may not be able to fully articulate the uniqueness of these elements and take certain (tacit) aspects for granted, the related knowledge becomes somewhat intractable to others in different host environments. Basically, the environment-specific component in the knowledge makes it difficult for the knowledge to be generalized and applied in other environments that are too different (Madhok 1997). Furthermore, complexity compounds the difficulty created by tacitness and specificity. When the articulated and environment-insensitive components of knowledge are transferred without the tacit and environment-specific components, the knowledge transfer is no longer so effective or useful due to
transmission losses. Moreover, the extra time taken to decode the tacit and specific components makes it hard to transfer knowledge quickly.

Taken together, the three antecedents of causal ambiguity limit the speed and scope of knowledge transfer. Selection mechanisms and managerial adaptations work to reduce causal ambiguity so as to facilitate microcoevolution. Absorptive capacity is critical in this regard.

Absorptive capacity as gatekeeper

Absorptive capacity is defined as the ability conferred by prior related knowledge to “recognize the value of new information, assimilate it, and apply it to commercial ends” (Cohen and Levinthal, 1990:128). Cohen and Levinthal argue that the firm’s absorptive capacity depends on the gatekeepers who stand either at the interface of the firm and the external environment or at the interface between subunits within the firm. This maps on well to the coevolutionary argument. Absorptive capacities at these two interfaces, in their terminology “outward-looking” and “inward-looking” absorptive capacity (Cohen and Levinthal 1990:133), capture the boundary-spanning functions of absorptive capacity at the macrocoevolutionary level and the microcoevolutionary level respectively.

Unlike causal ambiguity that produces negative effects on knowledge transfer, absorptive capacity can positively affect knowledge transfer. But, as we explain below, the simultaneous effect at two levels---macro and micro---implies a tradeoff, leading to mixed effects in general.

In the coevolutionary knowledge transfer context, a subsidiary faces two environments: macro- or host environment and micro- or the MNC environment.
Macrocoevolution has to do with outward-looking absorptive capacity. At the macro level, the external knowledge in the macro environment constitutes the variation to the MNC’s knowledge source. Through its absorptive capacity, the subsidiary evaluates the knowledge, selects the knowledge that is valuable and absorbs it. This, after further processing, can result in new initiatives in the local market (as well as within the firm). Besides, when assimilating new external knowledge, the absorptive capacity also changes simultaneously. Outward-looking absorptive capacity facilitates the fitness in macrocoevolution.

In contrast, microcoevolution leads to inward-looking absorptive capacity, which in turn facilitates the fitness in microcoevolution. The source of variation in the microenvironment changes from the external host environment to the internal MNC environment. Lane and Lubatkin (1998) found that one firm’s ability to learn from another firm depends, among other things, on the similarity of both firms’ knowledge bases and organizational structures. The dependence of inward-looking absorptive capacity on similar or compatible organizational structures, routines, and socially embedded norms suggests that continuous investment on inward-looking absorptive capacity can enable microcoevolution.

However, if microcoevolution is much slower than macroevolution (proposition 5), the evolution of subsidiaries that are scattered in different environments would be dominated by the macrocoevolution forces. The differences of the external environments would pull each subsidiary apart from each other more forcefully than the microcoevolution that tends to hold the subsidiaries together. The net effects are reflected in the heterogeneity of subsidiaries.
Heterogeneity has its drawbacks. One of the most prominent one is the difficulty that heterogeneity creates in the knowledge transfer process. Current knowledge-based strategy research has informed us that knowledge transfer, even between subsidiaries of the same MNC, is a sticky process (Szulanski 1996; Gupta and Govindarajan, 2000). When the subsidiary develops a high level of outward-looking absorptive capacity, this facilitates assimilation of knowledge from the host environment but does not directly contribute to internal knowledge transfer in the MNC. A smooth knowledge transfer within the microlevel environment requires a high level of inward-looking absorptive capacity.

Heterogeneity at the same time has its strengths. Differences in host environments are opportunities for firms to learn and to introduce new variations, both within the external and internal MNC environment. When subsidiaries in different environments evolve in different ways as a result of the macrocoevolution process, increased variety augments the probability that new knowledge or capabilities demanded by external environmental shifts can be found somewhere within the MNC network. Thus, the MNC’s knowledge base becomes more robust and potentially offers a competitive advantage to the MNC as a whole, if complemented by internal absorptive capacity. Arguably, subsidiaries can pay attention in particular to new sources of variation within their local environment that lend themselves to assimilation within the internal environment and that, in combination with variations in the internal environment, can result in new sources of competitive advantage.

In coevolution therefore, the key to managing the tension between heterogeneity and homogeneity lies in absorptive capacity. Absorptive capacity poses challenges and
simultaneously offers opportunities to management. While the heterogeneity of knowledge stock among subsidiaries of an MNC may be inevitable and even desirable, excessive dominance of either one type of absorptive capacity is dysfunctional. Effective absorptive capacity implies a balance (and sometimes a tradeoff) between inward-looking absorptive capacity and outward-looking absorptive capacity, the former focusing on microcoevolution and the latter on macrocoevolution. Investment on outward-looking absorptive capacity keeps the subsidiaries viable in their respective host environments, yet would not be so valuable for the firm as a whole without simultaneous microcoevolutionary absorptive capacity. Adequate inward-looking absorptive capacity makes the favorable variations in some subsidiaries accessible to other subsidiaries within the MNC network. Managerial efforts are needed to achieve the ideal balance. (Exploration/exploitation Frost).

**P6a:** Absorptive capacity has mixed effects on knowledge transfer.

**P6b:** Outward-looking absorptive capacity has positive effects on the speed and scope of transfer between the subsidiary and the local environment and negative effects on the speed and scope of knowledge transfer within the MNC.

**P6c:** Inward-looking absorptive capacity has positive effects on the speed and scope of knowledge transfer within the MNC and negative effects on the speed and scope of transfer between the subsidiary and the local environment.

**P6d:** For effective management of the coevolutionary process, firms need to achieve a balance between external and internal absorptive capacity.

**DISCUSSION**

The coevolutionary argument can be applied to a number of issues that are salient to the field of management.

*The firm as a manager of knowledge*
In the co-evolutionary theory of the MNC as presented above, the critical capability of the MNC is that of the management of knowledge flows globally, both to and from external and internal environments. Recent work on knowledge management in the strategic management literature complements the coevolutionary perspective well. From a knowledge-based perspective, firms are not just efficient governance structures but also institutions for learning (Kogut and Zander, 1992; Ghoshal and Moran, 1996, March 1991) that serve as a vehicle to generate as well as transfer and exploit knowledge, both embodied and otherwise.

A great variety of knowledge-based research topics have been analyzed such as, among others: tacit knowledge as the source of competitive advantage (Zander and Kogut, 1995), explanators of the direction of knowledge flows (Gupta and Govindarajan 2000; Frost 2001); and the role and importance of regional clusters for absorbing external knowledge (Birkinshaw and Hood, 2000). Broadly speaking, the common glue underlying much of this work has been on the long term potential for value creation and capture through knowledge generation, absorption, diffusion, assimilation and deployment. The emphasis on long-term value shifts the focus towards a more dynamic perspective of knowledge management by firms, one which can accommodate concepts like firm evolution and changes in its capabilities.

Moreover, if firms are repositories of knowledge, then the global firm can be viewed as a ‘portfolio of knowledge centers’ (Gupta and Govindarajan 2000), with each subsidiary, and even site (Doz et al), envisioned as a bundle of knowledge and capabilities. Each member of this portfolio exists within, draws upon and contributes to the internal knowledge base of the firm (Mudambi). It is therefore both a consumer as
well as a producer and provider of knowledge, part of which is unique—such uniqueness arising from the process of exploring and exploiting opportunities in local environments that are heterogeneous in nature—and part of which is related, such relatedness arising through the process of transferring, receiving, and adapting knowledge from other parts of the firm. The former pertains more to the macrocoevolutionary aspects and the latter to the micro.

Basically, each subsidiary is operating in two markets: the host environment and the rest of the firm. Often, prosperity in its local niche also requires inflows from elsewhere in the firm. At the same time, its niche within the MNC may not prosper unless the local capabilities generated, whether in the form of knowledge or products, can be made available to and adapted/leveraged by other entities within the MN system. Specialized knowledge that is ‘imprisoned’ in the local context runs the risk of a weakened position (as a result of its isolation), while knowledge sharing increases a subsidiary’s stock of ‘currency’ for future inflows.

Now, while the value of the knowledge produced by the subsidiaries would be limited if it were not shared by other members, yet not all knowledge is worth sharing (Zhou and George 2001). Clearly, the type of knowledge matters in this regard. For instance, with respect to knowledge, Zhou and George (2001) distinguished between the knowledge and learning at the level of the subunit and that at the level of the knowledge domain. At the subunit level, learning occurs in the process of interacting with both the local environment and other subsidiaries. The knowledge domain level comprises knowledge about technology, sales and marketing, and knowledge pertaining to various actors like government agencies, competitors and suppliers. It is obvious that some of this
is only locally relevant. Somewhat differently, Erikssen et al () categorize knowledge into external business knowledge and internal organizing knowledge, the former dealing with products, markets and technology and the latter with knowledge of structures, systems, etc. Such attempts at categorization as the above map on well onto the coevolutionary framework. Subunit level knowledge is both external (how to cope with local conditions, including government agencies, suppliers, competitors, etc, and sourcing new knowledge from environment) as well as internal (how to retrieve and combine knowledge from peer units).

It is obvious that some of the associated knowledge, both at the level of subunit and domain, is only locally relevant whereas some is relevant more globally. Firm (and subsidiary) managements need to sort out locally specialized knowledge from more globally (organizationally) relevant knowledge worldwide and leverage the latter to other units in order to complement each’s local knowledge. This latter is done through various internal organizational mechanisms, such as incentives, formal and informal communication channels, corporate socialization practices, etc., which have been identified by many researchers.

Thus, we can see elements of both macro- and microcoevolution in the knowledge management process. Macrocoevolution pertains to the different sources and types of knowledge, as subsidiaries cope with their respective environments, and the latter pertains to the internal procedures and routines within the firm to manage and leverage locally generated knowledge globally. For the MN firm as a whole, a balance needs to be struck between the need for new knowledge and the need for assimilating those aspects suitable for exploitation within the existing network.
Put differently, firm managements need to encourage their subsidiaries to both generate new knowledge and to exploit existing knowledge. In effect, the role of the MNC management is to act as the architect and bridge between micro and macrocoevolution and, in doing so, become a catalyst and coordinator of knowledge stocks and flows across this dynamic network of subsidiaries. This requires management (a) to become more knowledgeable and informed about the activities of a particular affiliate in order to understand and appreciate its needs and contributions (b) to, in a general sense, become both more knowledgeable and globally informed about the multiple kinds of activities being performed within the various parts of the organization, and outside, and (c) to harness, leverage and channel the more pertinent information and knowledge to the relevant units and subunits in a productive manner.

Coevolution and competitive advantage

While work on coevolutionary theory has brought fresh energy into the thinking on organizational evolution, yet, reflecting its organization theory roots, it is still mainly concerned with the synchronization or fit between the firm and the environment and among various parts of the firm. This predominant focus on fit results in the neglect of the notion of competitive advantage, the central concern of strategic management literature.

The quest for a knowledge-based advantage has made MNCs less hierarchical in that where earlier firm advantages were considered to be rooted in the home country/HQ, today it is increasingly recognized that they could be more dispersed and located at different points or nodes in the multinational system as a result of macrocoevolutionary forces. In other words, there has occurred a shift towards subsidiaries and subsidiary
specific advantage (Birkinshaw 2001; Rugman and Verbeke 2001). One part of this advantage is sticky at the subsidiary level since it alone is present in the particular niche and has an intimate knowledge of that niche. Subsidiary-specific advantage is important but clearly not sufficient. It is the ability of the management of the multinational firm to tap into relevant location-bound knowledge and make it non-location-bound, and thus available to the rest of the firm, through various organizational mechanisms, which is critical. This alone allows the firm to leverage its knowledge assets and extract the full rent potential. In a sense then, there is a third (meso) level of firm advantage---the network level (Rugman and Verbeke 2001)---which is created through the interaction between the HQ and the various subsidiary specific advantages.

To the extent that the multinational advantage has changed from the ownership of a HQ-based advantage to an advantage embedded in its internal configuration and network relations, the significance of a particular location and of a particular subsidiary lies in how it contributes in the acquisition, leveraging, transformation and exploitation of a firm’s capabilities worldwide. Here, both the density and quality of linkages to the local milieu as well as to the rest of the firm are of equal importance.

Thus, in general, the evolution of firm capabilities as a whole is a joint outcome of the macro and micro coevolutionary processes. Better management of the multinational firm requires firms to recognize, shape and respond to both macro and microcoevolutionary forces. The firm’s ability to manage subsidiaries in a macrocoevolutionary way so that they ebb and flow with respect to their respective niches, cemented with the ability to manage them in a microcoevolutionary way so that
the entire firm benefits from various subsidiary initiatives can be a distinctive feature underlining firm advantage.

The management therefore, through its direction of this coevolutionary process, creates a dynamic advantage for the multinational corporation. This requires balancing both subsidiary specific advantage, which reflects historical processes where characteristics of subsidiaries and local markets over time are crucial factors, and firm specific advantage, which reflects an overall corporate strategy where role of subsidiary and relationship are coordinated, shaped and designed (Holm). Accordingly, the key challenge for the MN firm today would be to cultivate metanational capabilities, with the metanational being defined as “a company that builds a new kind of competitive advantage by discovering, accessing, mobilizing, and leveraging knowledge from many locations” (Doz). Metanational capabilities entail sensing capabilities (for accessing new knowledge), mobilizing dispersed knowledge (to build necessary connections across its worldwide network) and operationalizing it locally.

There are differences among firms in how they manage the coevolutionary process. To put it in the context of the resource-based argument of strategic management theory, such an ability is embedded in a firm’s administrative heritage (Bartlett and Ghoshal 1989) and routines, and can be characterized by certain key properties---tacit, socially complex, causally ambiguous and thus difficult to imitate---which result in it becoming the key source of firm-specific rents (Barney, 1991). As a result, not only is the coevolutionary ability a valuable asset but also potentially the source of sustainable competitive advantage among multinational competitors. This can be viewed as the coevolutional advantage which then results in coevolutional rents.
The multinational firm as a subeconomy

In recent years, as a result of multinational firms’ strategy and of coevolutionary processes, there has been increasing intra-firm specialization throughout the global configuration of operations in order to match affiliate capabilities to their respective environments and affiliate charters to capabilities, many of which may be at least partially location-bound. This encompasses not just the flow of goods but increasingly the flow of knowledge and ideas and reflects the increasing breadth and depth of exchanges among affiliates of multinational firms. All this also manifests itself through increased levels of intrafirm trade in goods and services occurring within multinational firm boundaries (WIR).

Therefore, rather than foreign firms operating in local economies, a MNC can be more appropriately approached as a sub-economy in its own right. Accordingly, firm decisions are made more and more in light of how they support the internal sub-economy of the firm. This subscribes to the differentiated network model (Bartlett & Ghoshal). In this regard, the market for internal resource allocation is not non-competitive. In addition to their ‘normal’ relations, constituent subsidiaries would also compete in the internal market for the scarce resource, like charter (Galunic and Eisenhardt 1996; Birkinshaw and Hood 1998), manufacturing capacity (Burgelman 1994), research mandate, etc.

Hierarchies can play an important role in the nurturing and maintenance of such a subeconomy. We mentioned earlier that the possession of unique but related knowledge increases a subsidiary’s stock of value to other subsidiaries, which then behaves as a currency. Effectively then, within the firm, subsidiaries are in the business of trading
knowhow, “where knowledge sharing is an implicit contract and subsidiaries are embedded in a system of continuous knowledge exchanges” (Doz).

In this regard, Doz et al found evidence of strong vertical links (i.e. HQ - subunit) for sensing and exploring and more lateral links (across subunits) for mobilizing knowledge. Along similar lines, Zhou and George (2001) distinguished between collecting new knowledge---or exploration-oriented learning---and combining existing knowledge, which is more incremental and exploitation-oriented. They found that the former resulted in greater vertical outflows but not horizontal outflows and speculated that the reason was the uncertain relevance of new knowledge for other units. Basically, in our context, if the MN firm was unable to ensure both quickness and comprehensiveness in discovering the implications of new knowledge, they would be burdened by potentially high costs (of exploration) as well as the inability to take full advantage of new opportunities (exploitation).

Vertical flows play an important role in this discovery process. By pooling together the knowledge from various initiatives by remote subunits across its system, the firm is able to (a) test, evaluate and select the respective initiatives for their value to the firm as a whole, and (b) discover opportunities that may arise through selective combination (Zhou and George 2001). Gupta and Govindarajan (2000) and Doz et al make a similar argument that knowledge transfer in the MNC requires the presence and interaction of three actors: source, unit and a higher level (regional/headquarters) intermediary whose role is to recognize the existence of unique knowledge in the source, the potential value to the target and to play the coordinating role to bring them together.

To analyze the above argument through a coevolutionary lens, the knowledge
management procedure is basically an issue of internal selection. Various inputs and innovations are sent to a higher level. These are then ‘tested’ in a relative sense among competing initiatives and selected in or out, whether in combination with other initiatives or not. In contrast to new knowledge, combining older knowledge is characterized by more horizontal flows since the relevance of knowledge is more certain and the issue is more one of adaptation and exploitation. (Zhou and George 2001). In a sense then, the argument implies a complementary role between the hierarchy and the heterarchy (Hedlund 1994).

Microcoevolution therefore leads to the creation of mechanisms that enable the firm to engage in effective and efficient knowledge exchange and transfer, thereby creating an internal market that is more functional than external markets. At the same time, as a result of the internal selection processes, certain initiatives gather momentum and ultimately culminate in certain products and technologies in local environments, which can be considered as an adaptation at the macrolevel.

[Here, both the extent and speed of knowledge transfer are important. The extent of knowledge transfer reflects firm success in leveraging and building upon large amounts of dispersed knowledge within the organization. The speed of knowledge transfer is particularly crucial in dynamic industries since slowness would result in sacrificing knowledge-related rents due to obsolescence.]

Reflecting on the above, “hierarchies can serve as efficient clearing houses for new knowledge with uncertain relevance” (Zhou and George (2001: 677). In playing this role, hierarchies enable the discovery of new resource combinations through exposure to, and commingling with diverse related knowledge, both new and existing, in a manner
that markets cannot do. Markets are more efficient at exploiting existing assets than at creating them in the first place. In other words, effective coevolution creates and maintains the mechanisms to promote and coordinate such ‘encounters’ between knowledge assets that are often too dispersed to ‘meet’ in the free market.

The role of management here is to create the appropriate context for the coevolutionary processes, or what may be termed more appropriately as ‘guided evolution (Lovas and Ghoshal). To the extent that the firm (and its subsidiaries) can create and leverage resident knowledge throughout its internal economy through various coordinative mechanisms, the firm has an advantage over markets.

Implications for theory, research, firms

From the arguments in this paper, researchers in strategy and organization theory stand to gain interesting and valuable insights by combining a coevolutionary theory with a major strategy theory such as the knowledge-based view. With respect to coevolution, it is important to understand not just whether but also how organizations coevolve with the environment. This includes issues like: how do the environmental selection forces interact with managerial adaptation; how does the interaction take place at multiple levels; or how does the microcoevolution within the organization relate to the macrocoevolution. Aspects of the knowledge management literature in strategy research can potentially play an important role in extending insight into these issues, and thus strengthen the theoretical underpinnings of the coevolutionary framework. For instance, 

On the other hand, while the work on knowledge management has been escalating in recent years, it tends to be somewhat fragmented and lacks a unifying structure.
Different researchers offer different takes on the phenomenon, and approach aspects of knowledge at multiple levels and in multiple ways. Some researchers look at it from a more micro level --- for instance, intra-firm flows of knowledge (e.g. Szulanski 1996; George and Zhou 2001; Kostova 1999), while others look more closely at the flows between the firm and its environment (e.g. Porter 1990, Birkinshaw and Hood 2000). In general, whereas the former tends to focus on issues like the structure, mechanisms and processes that underlie knowledge transfer and absorption within the firm (Gupta and Govindarajan 2000; Szulanski 1996; Kostova 1999), it tends to neglect the influence of local environments. [Therefore, it cannot inform us, for instance, why certain knowledge is being transferred and why some other knowledge is not.?? Other questions???] In contrast, the macro level is more externally focused and concerned with issues to do with economic geography like knowledge clusters in local environments (Frost, 2001; Birkinshaw and Hood 2000), but tends to overlook the structure, process and mechanisms of knowledge creation and transfer within the firm. However, questions to this macro focus would be, for instance, how would specific knowledge assimilated from a local knowledge environment impact knowledge transfer? When each subsidiary achieves high homogeneity with the local knowledge environment and can assimilate external knowledge easily, is this local “fit” achieved at global expense? Global fit decreases (and costs increase) as other subsidiaries find it difficult to assimilate knowledge from this subsidiary.

The coevolutionary framework could bring multilevel and dynamic insights into strategy and, in this way, has promise to both provide a unifying framework as well as strengthen the theoretical underpinnings of the knowledge-based view. A framework that
integrates both micro and macro levels of analysis would greatly help to generate new insights. However, true to its roots in organization theory, the coevolutionary framework is mostly concerned with issues like organizational fit and does not really wrestle with issues central to strategy research such as competitive advantage. Yet, underlying the knowledge-based strategy literature are issues of both fit and competitive advantage. By drawing the link between coevolutionary theory and competitive advantage, this paper becomes more central to both strategy and organization theory researchers.

With respect to theory, we commenced by mentioning how earlier theories of the multinational enterprise approached the MN firm at an institutional level, and were consequently ill-equipped to actually engage with the phenomenon at the level that concerns management scholars the most. We further mentioned that, in spite of some insightful studies that investigated the inner workings of multinational firms at the managerial level, primarily through some rich case analyses, the potential for these to become integrated into mainstream research has been partially stymied as a result of weak connections to existing theories (Zaheer 2002), such as the (a) resource/capabilities view of the firm (b) theories of knowledge creation and retention (3) theories of the multinational enterprise, and (4) theories addressing the interaction of location with organization.

We contend that, in some way or the other though to differing degrees, the coevolutionary framework and the coevolutional advantage encompasses all the various issues mentioned above. Moreover, with respect to (4) above, Zaheer identifies the importance of the institutional context in which a subsidiary is embedded as another ‘missing bridge’ that has to be brought into the TN model in order to address issues such
as subsidiary legitimacy or the relationship between location factors such as clusters and the structure of value-added. The coevolutionary framework also addresses this issue. While this paper has not explicitly utilized institutional theory, the basic arguments can readily be adapted to do so. For instance, from an institutional perspective, in order to increase legitimacy, a subsidiary would tend to become isomorphic with the local environment. Yet, in order to maintain its legitimacy within the system, it is important to not become a ‘lone wolf’ in isolation from the rest of the pack. Diversity without a uniting identity is not so desirable. The sentiment here is similar to macro and microcoevolution.

The coevolutionary framework also has numerous implications for research. Firms can differ on various dimensions that would influence the coevolutionary process and coevolutionary capabilities. For instance, besides overall strategy and structure, there can be differences in local commitment, which would in turn be reflected in organizational and managerial practices with respect to hiring local staff and training and integrating them. On a different note would be a firm’s strategy towards ownership or strategy towards sourcing. The ownership structure of production and sales affiliates affects the scope for and extent of transfer of technology and organizational and managerial practices. Moreover, sourcing strategies affect the extent and quality of linkages to the host economy and the knowledge and technology that flows from TNC systems to local economies through local subsidiaries, and vice versa, in the form of designs, manufacturing knowledge and process knowhow, quality control, supplier/customer training, etc. All these issues have implications for both macro and
micro coevolution¹.

While different authors have addressed aspects of knowledge in different ways, it all boils down in the broader sense to the sources, the processing and the uses of knowledge. The sources of knowledge can be the local subsidiary environment, a subsidiary’s own initiatives, or the MN firm’s internal environment, or a combination of any of these. While much of past research in knowledge management has concentrated on the characteristics of knowledge (e.g. tacit versus explicit knowledge), it is important to recognize that different sources of knowledge may reflect different knowledge characteristics and, accordingly, may require different means and conditions for their processing, transfer and application (Foss and Pedersen; Kostova 2002). For instance, externally embedded knowledge may be only weakly amenable to transmission by formal channels and may require richer media.

Clearly, all the above gives rise to a rich research agenda ahead, both at the macro and micro-levels. An example of the former would be: In distributing its activities across subsidiaries, what is the role of the subsidiary and that of the local environment, and what is the interaction between the two? Examples of the latter would be: How exactly does the firm transfer, adapt and leverage the products and resources generated from the current distribution of activities across its activities worldwide? What are the sorting mechanisms to balance uniqueness and relatedness? And, in a dynamic sense, how do the latter processes impact subsequent distribution of activities? These are all important questions for research.

¹ The process of importing, melding, and exporting knowledge to and from local units can also add to resident capabilities in the local environment through intended and unintended spillovers (Mudambi), which adds a dynamic dimension to the process.
CONCLUSION

Research on the management of multinational corporations (MNCs) has examined various issues pertinent to MNCs from different angles, such as, in the 70s, the firm’s relative efficiency in organizing economic activities within the MNC network in relation to the market (Buckley and Casson, 1976) or, in the 80s, the internal control and coordination relations among MNC subsidiaries and headquarters (Hedlund, 1986). In more recent years, researchers (Birkinshaw & Morrison, 1995; Holm and Pedersen, 2000; Birkinshaw and Hood, 1998; Gupta and Govindarajan, 2000; Bartlett and Ghoshal 1990) have emphasized a more ‘enlightened’ view of the multinational corporation as an integrated network of subsidiaries with differing roles and responsibilities. These differences in roles assumed by subsidiaries over time are determined by various drivers, such as the local environment, the MNC environment and the entrepreneurial capacity of the subsidiary. However, the coevolutionary framework has not been explicitly extended into the research of the multinational corporations as yet. This is a key contribution of this paper.

[In this regard, even though theories of the MNE are in the nature of theories of the firm, with the MN firm being a special case or type of firm, in our opinion they do not address the issues most relevant to management scholars, issues that address competitive advantage at the firm level. We would like to propose that the coevolutionary theory put forward in this paper potentially provides the underlying basis for a new (managerial) theory of the MN firm.]

[Also, while we have built up our arguments around the MN firms, the MN is, as mentioned, just a special case. The arguments, broadly speaking, should be equally
applicable to firms in general, in which case we have the beginnings of a new coevolutionary theory of the firm, one that is more dynamic than many of the existing theories of the firm.]

The concepts of macrocoevolution and microcoevolution have a special relevance for the multinational corporation because of the diversity of environments in which the firm operates and the particular role each subsidiary occupies in the multinational firm’s configuration. In this article, we have synthesized the broad literature that contributes to the coevolutionary management of MNCs and, in doing so, drawn connections between relevant aspects of organization theory and the knowledge management stream in the strategic management literature. We also examined the interrelationship between macro- and microcoevolution. In sum, we made the following points. The coevolutionary process encompasses both macrocoevolution with the environment and microcoevolution among the parts and the whole. The market (environmental selection) is dominant in macrocoevolution whereas microcoevolution is more at the management’s discretion, even when internal selection markets exist. The MNC’s coevolution leads to both causal ambiguity, which creates barriers to knowledge transfer, and absorptive capacity, which produces mixed effects on knowledge transfer. In this regard, fitness with the host environment enhances outward-looking absorptive capacity and helps increase the speed of macrocoevolution while fitness among the parts and the whole increases inward-looking absorptive capacity and helps increase the speed of microcoevolution. The management dilemma, and challenge, is to maintain a balance between the two.

Through the coevolutionary perspective on MNCs, this paper addresses some important issues that are central to strategy and management research. First, the
perspective brings the multilevel framework into the research of MNCs in a more rigorous manner, answering the call previous research has made that more attention needs to be paid to both the subfirm level and firm level simultaneously (Birkinshaw and Hood, 1998). Second, the speed difference at the macro- and micro-level links up the external market and intrafirm resources, which has been suggested as an important research agenda in strategy research (Priem and Butler, 2001a, 2001b; Barney, 2001). Third, it infuses certain additional aspects to the role of hierarchy in the ongoing markets versus hierarchies debate, namely the hierarchy as both a ‘clearing house’ and ‘connector’ of knowledge. Last but not least, the paper instills the notion of competitive advantage, central to strategy research, into the relevant elements of organization theory and, by the same token, introduces the notion of coevolutional advantage and coevolutional rents, a hitherto undiscovered concept, into strategic management theory. An important area for future research would be to investigate how exactly to facilitate the coevolutionary process.
Dunning (1971) put forward his eclectic framework wherein he claimed that the emergence of multinational firms required (1) an ownership advantage on the part of MN firms to overcome the liability of foreignness (2) a location-specific advantage that complements the ownership advantage and drives firms to locate in a particular location, and (3) an internalization advantage that drives firms to organize the activity internally rather than licensing.

Re-interpreting the above, the basic question being asked is “Why do multinational firms exist?”, this being simply a direct extension of Coase’s question applied to the specific case of the multinational firm. The question has two components: (1) why does a firm go abroad, and (2) why does it do so through its own subsidiary (i.e., hierarchy) and not other more market-like mechanisms such as licensing? The answer put forward, and explained most articulately by Buckley and Casson, is that there are certain costs to using the market mechanisms, which in turn undermine their efficiency. In an extension of his eclectic framework, and in tandem with increasing globalization and coordination of activities across markets, Dunning argued that a particular advantage of multinational firms stemmed from economies of common governance.

Note that the question of why firms exist, or why multinational firms exist, operates at the institutional level: firms and markets. It is not really equipped to address the firm level, which is the primary level of interest to management scholars. Therefore, for instance, the MN firm has an advantage over the local firm, such advantage stemming from a superiorly endowed home environment (also Vernon 1966). Yet, if this is the case,
such advantage is available in principle to all home-country firms in that industry. The argument is not about a specific firm but the home country firm. Similarly, if there is a location-specific advantage, such advantage is available in principle to all firms that locate there. Moreover, for many MNCs, the competition is no longer merely vis-à-vis local firms but increasingly against other global firms operating in local markets. In such a case, economies of common governance are available in principle to all global firms. The argument therefore remains at the institutional level, i.e. the global firm versus the local firm. It does not distinguish between the institutional level of the MNC and the level of a specific multinational firm. This leaves us with the question “What accounts for performance differences across global competitor firms?”