

**The Multinational Enterprise
as a Learning Organization**

by

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Abstract

This paper develops the concept of the multinational enterprise as a learning organization. In terms of *efficiency*, the firm operating in a multiple of countries gains advantages relative to the firm operating in a single country from scale and scope, but these advantages are constrained by operating and coordination costs that rise the more distant the location from central headquarters, Kindleberger (1969) . In terms of *learning*, however, the firm operating in a multiple of national settings may be expected to experience wider opportunities to innovate in response to diverse environmental stimuli than the single-nation firm. These relative opportunities are greatest when knowledge is tacit, learning requires 'doing,' and multinationals' overseas facilities are in the form of proprietary distribution channels or R&D, as well as (or instead of) primary and secondary production. The realization of learning opportunities and the minimization of operating inefficiencies will depend on whether the multinational: (1) employs corporate-wide incentives that elicit innovations that are likely to be of value to the entire firm; and (2) effectively diffuses innovations to other units within the firm.

Among the advantages expected of multi-country learning is the creation of barriers to entry by single-location firms. This does not, however, imply that multinationals from the most industrialized economies will succeed in preventing new entry. Their ability to do so rests will depend on their learning capabilities. It will also depend on the quality of the challenge that faces them. In the case of a challenge from emerging economies, local firms that can move down their global product/process and local environmental learning curves simultaneously may be expected to dominate both first-world multinationals that learn only at home and local firms that lack effective mechanisms for learning in global 'lead' markets. Whether the advantage lies with first-world or emerging economy-based multinational enterprises will depend on the relative value of global and local

learning, and of the relative multipoint learning capabilities of the two. The advantage of first-world players will decrease as technologies mature, as well as the extent to which relevant products and processes no longer follow single global standards but vary in line with differences in incomes, factor costs, tastes and product requirements.

New entries from emerging economies in oligopolistic industries are consistent with our multi-country learning story, although they do not prove it. The automobile industry, for one, has recently experienced new entry by Korean companies, the personal computer industry has encountered entry by Taiwanese firms, and seamless steel tubing and port cranes industries have witnessed entry by Argentine-based firms. In the first two cases at least, new entrants benefited from favorable home factor conditions, but anecdotal evidence suggests that they also were quite competent at learning outside their home markets. They are themselves becoming multinational, perhaps only to exploit home-based learning with greater market scale, but probably to learn abroad as well.

This is a reminder that the learning process is *contingent* rather than *deterministic*: it depends not only on opportunities to learn but also on costly investments to exploit such opportunities. A fuller empirical awareness of the contingencies is a prerequisite for more systematic theorizing about the multi-country learning phenomenon.

The Phenomenon: Introduction

If one is to believe the statements of top managers of multinational enterprises (MNEs) and the applied international management literature that studies their strategy and organization, a unique benefit that these firms seek to obtain is a richer learning experience about products, processes, and organizing principles due to their multinational reach.¹ A major challenge becomes how to structure themselves to learn what is best for all their operating units and to diffuse what is learned in one part of the organization to other parts.

Many US and European enterprises have set up learning posts in the form of R&D facilities in Japan, often on a financial scale and product scope that are far ahead of their local production. The same disproportionate investment in learning relative to production are true of many Japanese and now Korean R&D ventures in the US and Europe. Statistical indicators show a rising trend in foreign direct investment in R&D and in joint ventures between home-host pairs, where the host is 'uphill' technically.

Concomitantly, firms have re-structured themselves to focus attention on particular learning opportunities and to diffuse local learning quickly throughout their organizations. A key element of the design of ABB's international organization, for example, which has served as a benchmark for many other MNEs, is to take advantage of the variety of technological and market locations in which it operates to generate, select, and diffuse new products, processes, and organizational forms company-wide. IBM's recent reorganization, from one where the dominant dimensions were product lines within regions to one where the dominant

¹ See, for example, *The Economist* (1995) and Bartlett and Ghoshal (1989).

dimensions are business solutions across regions, is also seen as an attempt to exploit the learning opportunities created by multi-site operations.

Despite the salience of learning as a motive for multinational expansion, and despite the significance of diffusion as a key organizational challenge, the perspective of the MNE as a crucible of learning is not reflected in extant economic models that purport to explain multinational enterprise behavior. This paper seeks to develop such a perspective. It defines a multinational as a learning organization if it: (1) exploits the variety of circumstances in which it operates to generate innovations; (2) employs corporate-wide mechanisms to create incentives for innovations that appear to be of greatest value to the firm as a whole; and (3) efficiently diffuses these innovations to units other than those responsible for the innovation.

Learning in the multinational takes place on different structural levels: 'local for local' application (adapting a product to a particular local market); 'center for global' or multiple local application (developing new products or processes at the core for exploitation throughout the system); 'local for global' (developing a product or service based on the local stimuli that is relevant to and can be transferred to more units within the firm); and 'multi-local for global' (interactively developing a product or process among the center and/or local units, taking advantage of differences in each location's capabilities and the stimuli they face). Our principal interest lies with last two levels, 'local for global' and 'multi-local for global'. The potential for learning at these two levels make the multinational a particularly interesting phenomenon for studying learning. These levels also have special implications for competition based on product and process innovations that are appropriate for some but not all countries, especially those that are

relevant to middle-income, emerging economies rather than highly industrialized economies.

In order for a multinational to be a learning organization at these two levels, it requires that (some of) its overseas investments include not simply a production facility but also an innovation capability, whether in the form of a customer service unit, a production engineering unit, or an R&D facility, whose role goes beyond the direct support of production.

Our view of organizational learning should be regarded as part of the 'network advantage' explanation of MNEs as articulated by Kogut (1985):

It is principally the operating side which drives the incremental value of being multinational. This operating flexibility stems from the benefits of coordinating the flows within a multinational network. The value of such flexibility rests not only on exploiting differentials in factor, product, and capital markets, but also on the transfer of learning and innovations throughout the firm.

Learning from variety, in contrast to flexibility in operations across locations, is the operative dimension. A global learning organization is one that has global cognitive scope.² It is a firm that learns in many of the market, technological, and institutional environments in which it operates and successfully incorporates this learning in its overall behavior. Learning on a local for local basis in a variety of locations does not qualify as global organizational learning.³ The firm must somehow be able to exploit the multi-point nature of learning and transform it into an economy of scope. Therefore, the potential for global learning also should be regarded as part of the resource-based explanations of learning by dominant business enterprises articulated by Chandler & Hikino (1996). Learning in these enterprises is facilitated by concentrations of financial and managerial resources that arise partly

²The concept of cognitive scope goes back to Perlmutter (1969). He defined firms as ethnocentric, polycentric, and geocentric.

³Of course, if the local units learn better than local units in other MNEs or local firms because of some firm wide learning about learning, this would qualify as a global learning organization.

from operating on a large scale and on a broad scope, and by the range and variety of stimuli they encounter.

Our view of organizational learning differs from that of Porter (1990) , who assumes that a firm's knowledge and experience are largely home-based, and that little learning takes place outside a firm's national domain. It is also at variance with that of Kindleberger (1969), who correctly emphasizes the costs of doing business at a distance. Considering the terrain bounded by our view and Kindleberger's, the challenge facing a multinational manager is one of repressing the inefficiencies inherent in multi-site operations (moving down multiple environmental learning curves) and exploiting the learning potentials of such operations (moving down the product/process or technological learning curve).

The proposition that MNEs are multi-point learning organizations carries implications related to both theory and policy. For instance, it implies that MNEs will locate key learning-related activities in those technological and market environments most conducive to learning. These will not necessarily correspond to production locations dictated by factor conditions, transportation costs or scale, or even by the physical or geographical closeness of particular countries to a firm's home base. Rather, environments most conducive to learning may be characterized by fast growth rates of new markets, rapidly changing demand patterns, the presence of 'lead' users, well-defined university-industrial liaisons, and so forth.⁴ Generally innovation activities will be located wherever they provide the best tradeoff between learning potential and the costs of capturing and diffusing this learning.

If outward direct foreign investment (DFI) is viewed primarily as a capital transfer, then government measures toward such DFI may understandably seek to

⁴Porter (1990) emphasizes the role of demand conditions , including the sophistication of tastes as determining the "competitiveness" of a country (region) as a home base to multinationals. Von Hippel demonstrates how powerful a source of innovation "lead " users are, since they have rich knowledge about the function a product performs, and often even enough knowledge to modify an existing product to make it better to suit their needs Von Hippel (1986) .

stem outflows of financial and organizational resources. By contrast, if a learning perspective is taken, then overseas investment in controlled sales networks and innovation activities in 'lead' markets may improve home levels of productivity. Policy measures that are hostile to outward DFI should be less given such learning spillovers.⁵

As for global competition, if learning activities are concentrated in a small number of countries, competition among countries to capture these activities may be expected to rise, especially in light of learning externalities. However, even if emerging economies such as Brazil, China, India and Korea succeed in becoming sites for the learning-driven investments of MNEs, they may not succeed in establishing their own MNEs, and locally-based firms that do not expand internationally are unlikely to learn effectively.

We selectively pursue only some of these implications below as well as only some of the theoretical and organizational issues mentioned earlier. In the first part of the paper we explore the nature of organizational learning and how it relates to the learning opportunities that we predicate exist due to multi-site international investment. Then we review existing theories of multinationals and foreign investment by way of suggesting how and why our own learning perspective substitutes for or complements these views. In the second part of the paper we examine the respective learning processes whereby a 'David' outwitted a 'Goliath' in the automobile industry, analyzing the tensions between environmental and technological learning and how a single-nation firm manages to learn on a global scale. We then consider the likely advantage of local firms, both domestically focused and multinational, relative to first world-based MNEs, in developing products or processes for low and middle income countries whose needs are no

⁵This will be especially true in cases where the home country is a 'characteristic location' for a number of lower and middle income countries, and where the appropriate product or processes for the market no longer match with those being developed in traditional lead markets.

longer served by products and processes that are developed in traditional lead markets, and examine the policies needed to encourage such development to take place in these countries. Finally, we briefly consider two learning contingencies related to incentives within the multinational to encourage types of innovations that are of firm-wide benefit, and problems of intra-firm diffusion.

The Multinational Enterprise as a Learning Organization

Learning (Dis)Abilities of Multi-Country Firms

Organizational learning has become a central issue in many sub-fields of strategy, international management and organizational studies.⁶ Researchers on such diverse topics as the resource-based view of the firm, organizational capabilities, diversification strategies, joint ventures and strategic alliances as well as organizational change and development have analyzed how knowledge is generated, transferred and acquired. For our purpose it is sufficient to state that organizational learning in the multinational enterprise represents a special case of organizational learning. It is special because it operates in a variety of markets and technological contexts and, therefore, faces especially high costs, as well as potentially high benefits, related to integrating knowledge that is culturally, geographically, and politically disparate.

These unusual costs and benefits suggest that the unique knowledge to which the multinational firm is exposed and which it attempts to master is more 'tacit' than 'explicit.' Consequently learning itself takes a primarily participatory form, that of learning by doing. If knowledge were fully codifiable and closer to the explicit rather than implicit end of the continuum,

⁶For a full discussion of organizational learning and knowledge, see Gast and Lessard (1996).

a firm would not have to locate physically in countries other than its own in order to learn. It could learn simply by buying information at arm's length, or it could trust its own scientists and engineers to acquire the same type of knowledge as quickly as those of a foreign competitor. But if knowledge is tacit, then learning by doing is necessary to insure timely learning of sufficient diversity.

By way of example, assume that for cultural reasons a Japanese laboratory engaged in R&D in bio-technology differs from an American laboratory engaged in the same generic type of R&D in terms of a wide array of variables: how basic technology is conceived; organizational structure; training of researchers; liaison with universities; and interaction with government. Minimally, both laboratories could keep abreast of each other's progress by scanning published literature, attending international conferences, hiring Ph.D.s from each other's universities, and so forth. But to anticipate better both the direction and outcome of each other's research, some cross-geographical investment would probably be necessary, whether in the form of a listening post or a full-scale facsimile of a competitor's own facility.

The same principle of involvement obtains concerning low-technology products. For a foreign firm to anticipate them first, before domestic competitors, it is likely to require some sort of local presence. Stated otherwise, a common yet erroneous view among observers of multinationals operating in middle income and developing countries is that foreign firms will inevitably transfer inappropriate products and processes due to differences between home and host country in factor endowments and income levels. But if products and processes in middle income countries differ from those in first world countries, multinationals that operate in

several such countries are as likely (or more likely) than locally-based firms to engage in appropriate innovation.

A case in point is the successful introduction of Pampers-Uni, a brand of disposable diapers designed for middle-income countries by Proctor and Gamble (P&G). First-world Pampers, whose features are determined by the tastes and incomes of the world's richest markets (Japan and the US in this case), were sold internationally, but met with limited success in countries such as Brazil because they were too expensive. P&G's Latin American technocenter, working closely with central R&D, developed a no-bells-and-whistles Pampers for the local market at half the cost. Subsequently, this product has been introduced in lower and middle income markets in Asia as well.⁷ This ability to exploit the intersection of global scope and experience with local knowledge and responsiveness is a difficult organizational feat.⁸ Kao, a Japanese multinational producer of consumer products, is the leader in disposable diapers in Japan, but had big problems marketing them in East Asia, allegedly because headquarters' managers overruled the decisions of local managers despite a restructured organization designed to be more responsive to local customers' needs.⁹ At the same time, CMPC, a Chilean firm, successfully matched P&G on product technology and marketing, to the point that the two competitors have subsequently pooled their disposable diaper operations in the southern cone.

The tacitness of knowledge and hence the importance of learning by doing is perhaps best illustrated by production-related competition. When it became apparent to American managers in the automobile industry that Toyota Motors was achieving high product quality and process productivity by using a different production system from that extant in American automobile plants (a system that was itself largely a

⁷ Interview with Jorge Montoya, head of P&G's Latin American operations, November 1995.

⁸This tension between global leverage and local responsiveness is a central theme in the international management literature. See, e.g., Doz and Prahalad (1981) and Bartlett and Ghoshal (1989).

⁹Bartlett and Ghoshal (1989), as noted in Flaherty (1996) .

product of learning by doing), there was a huge effort to learn more about Toyota. The effort involved plant tours in Japan by American executives and management specialists, educational seminars at leading American business schools, hundreds of published articles on specifics of the Toyota system such as inventory management and quality control, and lectures on the details of the system by Toyota executives and Japanese management specialists themselves. Yet in the case of General Motors, such technology transfer was largely ineffective -- for reasons related either to problems of conception or implementation. It was not until GM established a joint venture with Toyota in California -- explicitly for the purpose of learning -- that a GM unit (NUMMI) began to experience Toyota's productivity and quality levels (Womack, Jones, and Roos (1992).

Thus, we may conclude that the multinational enterprise is potentially a unique learning organization because of its exposure to multiple learning stimuli and knowledge contexts, where learning tends to be more tacit than explicit and, therefore, more in need of learning by doing than formal arms-length instruction to master.

The most interesting terrain for multi-point learning enterprises will be in those situations where appropriate product and process innovation differs from that required in advanced industrialized countries because of differences in income, tastes, and factor costs, yet advanced technologies are required to best meet these needs. In such cases, the most successful firms will be those that are sufficiently localized in various middle and low income countries to respond to the 'appropriate' product and process stimuli, ideally in more than one setting, but also participate in the relevant frontier science and technology arenas. Industry examples include automobiles and urban transport, a wide range of consumer durables and nondurables, producer durables for small and medium size enterprises, and housing construction. In contrast, truly global technologies such as

aircraft, electronic products, or Swatches, do not require the same type of multi-country localization.¹⁰

The Organizational Architecture of Multi-Country Learning

The current theory of direct foreign investment is production-centric: explanations for why a firm locates overseas typically presuppose that the firm's decision concerns the location of production facilities. This concentration on production, however, is too narrow a view since the internalization of sales can also represent a substantial portion of a firm's value added. In the case of foreign auto manufacturers entering the US, for example, their investment in market franchise through advertising and in dealer and service networks far outweighed their investment in production facilities. These activities were only captured to a limited extent in DFI statistics since most were treated as current expenses. Therefore, the resources transferred were in the form of less than normal profit on US operations.¹¹

When learning is taken into account as an investment motive, it is even more important to conceive multinational operations as comprising at least four possible functions or transformation stages:

- a) innovation (research, development, engineering),
- b) core manufacturing,
- c) secondary manufacturing, and
- d) marketing and distribution.

A multi-functional view of throughput is essential because as multinational activity is increasingly driven by learning, the form of foreign activity is likely to change

¹⁰ This distinction between global and non-global technologies was suggested by Dinesh Mohan.

¹¹ Campa and Guillén (1995) also demonstrate the importance of the internalization of sales for outward DFI from middle income countries. Not surprisingly, they further demonstrate that distribution-driven DFI, like production-driven DFI, has intangible assets at its root, as discussed in the next section.

from pure production to some sort of combination involving innovation, say, innovation-cum-distribution or innovation-cum-production (or both).

If learning is a push-pull phenomenon, it requires a close linkage between the internal innovation activities of the firm and its lead users, implying a direct connection between innovation, manufacturing and sales. Such a linkage is hard to create on an arms-length basis through, for instance, an independent local distributor, for all the standard reasons related to transactions costs.

Concerning the location of innovation activity, when the products, processes, or organizational capabilities that are relevant throughout a firm's global operations are similar to those required at home, the firm will tend to concentrate its innovative activities at home for economies of co-location. Even in this extreme case, though, the firm may spread its learning activities somewhat to increase the variety of learning experiences, as suggested in our earlier example about biotechnology. Thus, our learning perspective has important normative implications for how multi-country firms configure and coordinate their location choices.

Toward a Theory of the Multinational Enterprise as a Learning Organization

Current models of multinational enterprise and direct foreign investment reflect two underlying traditions -- capital flow theory and industrial organization theory. Neither approach, however, incorporates a dynamic view of the multi-country firm as a learner.

Hymer (1976) convincingly argued that direct foreign investment was an industrial phenomenon, driven by 'imperfections' in markets for intangible assets (such as managerial capabilities) rather than capital. The work on MNEs that followed typically began with a challenge to the capital flow theory, noting that observed direct foreign investment migrated to particular countries that were culturally close, that significant cross-flows took place, and that direct foreign

investment patterns displayed too much differential behavior at an industry and firm level to be solely a macro phenomenon (even if macro fluctuations were sometimes significant). As a result of Hymer's pioneering efforts and follow-up work by Kindleberger (1969) , Magee (1977) , Caves (1982) and others, multinational enterprises increasingly came to be viewed as 'exploiters of intangible assets', with internalization dominating market-mediated transactions. The intangible asset view was further elaborated by Buckley and Casson (1976) , Casson (1987) , Rugman (1981) and others in internalization theory, which essentially applied transaction cost economics to flesh out the market imperfections argument.

An alternative explanation for direct foreign investment that was developed in parallel with the intangible assets view emphasized physical scale and transportation costs (e.g Niehans (1977) ; Helpman and Krugman (1985)). Multinationals in this approach exist by way of an optimization in the tradeoff between scale and transportation costs.

Whatever the foregoing model, or other extant models such as the eclectic one of Dunning (1988) , all are essentially static. That is, all fail to specify where knowledge comes from and, therefore, all fail to specify what is responsible for the multinational firm's continued survival and success. While the intangible asset approach indirectly emphasizes knowledge as the key factor that drives either organizational or locational advantages, it typically does not specify how knowledge arises. Porter's view of home-based learning (Porter (1990)) is static, too, because it gives no account of how, under conditions of tacit knowledge, firms that fall behind catch up with their international competitors (as in the case of General Motors and Toyota). Kogut (1991) , in arguing that organizational capabilities are the primary determinants of a region's competitive advantages, requires that organizational principles diffuse more quickly within a region than across regions. Therefore,

Kogut implicitly assumes that multinational enterprises are limited in their ability to exploit the network advantages he develops in his earlier work (Kogut (1985)).

A knowledge-based dynamic theory of the multinational enterprise must have two parts. One part must comprise the generation of knowledge-assets as a function of multi-country operations. This includes assets developed jointly by units of the MNE that are geographically dispersed, as well as assets developed individually by local units operating in different environments. The other part must comprise cross-border mechanisms that are capable of motivating, guiding, and diffusing these knowledge assets within the multi-country firm. Both conditions are necessary for dynamic organizational learning. But together, both conditions are not sufficient to insure such learning. Whether the multinational invests enough to exploit its unique learning opportunities, and whether it learns more than single-country firms using alternative learning mechanisms, depend on a complex of conditions that have yet to be analyzed systematically. It is to such complexity that attention is now turned in the form of a brief case study.

Contingent Learning

The nature of learning -- whether individual or organizational -- is contingent rather than deterministic. The multinational enterprise may encounter greater opportunities to learn than the single-site firm, but it may neither be willing nor able to take advantage of them. This may be due to two sets of causes that blur and are difficult to identify separately: (1) ineffective management; and (2) global exigencies. Ineffective management may prevent the multinational from perceiving learning opportunities, from specifying the correct site at which to exploit them, and from implementing policies company-wide related to their exploitation. Global exigencies may be such that optimization of profits internationally precludes exploiting particular learning opportunities that would be

profitable in their own right, either because of the existence of mutually exclusive overall technology trajectories or because the complexity implied by multi-point innovation and the exploitation of such innovation would outstrip the firms' organizational capabilities. In the case of learning by single-national firms, even greater importance is likely to attach to the quality of management and the trade-off between long-term and short-term profit maximization, especially as they relate to the 'make-buy' decision about technology.

A good laboratory to examine some of these issues is provided by a competitive contest that occurred in the Korean automobile industry between a 50:50 joint venture (involving a local company and a multinational enterprise) and another local but single-country firm.¹² For exactly 30 years, beginning in 1962 with the enactment by the Korean government of an Automobile Industry Promotion Law, and 1992, when the joint venture was dissolved, Korean automobile production was dominated by the Daewoo Motor Company (DMC), a partnership between a member of the Daewoo group and General Motors, and the Hyundai Motor Company (HMC), a go-it-alone upstart that is also a large conglomerate affiliate. The upstart consistently out-performed the joint venture. With all of GM's competitive assets, how was this possible?

Table 1 compares the performance of HMC and DMC along several dimensions for one representative year, 1982. At full capacity, labor and capital productivity were roughly equal in the two firms. Capacity utilization, however, was far from equal, and not just in 1982, when Hyundai was operating at 67% of capacity compared with 20% for Daewoo. Capacity utilization was typically higher in Hyundai than in Daewoo and so, too, consequently, was labor and capital productivity. In 1979, when Korean automobile production reached a then record

¹²Information on this case study may be found in Amsden and Kim (1989).

peak, capacity utilization for Hyundai was 62% compared with 37% for Daewoo. A year earlier it was 108% and 24% respectively.

Table 1
The Competitive Context:
South Korean Automobile Industry, 1982

Parameters	Single-Site Firm Hyundai Motors	Joint Venture Daewoo Motors
A. Capital (Bil. won)	64.4	44.5
B. No. of Workers	9,129	5,675
C. Sales (Bil. won)	4.3	1.9
D. Capacity (Units)	116,000	76,000
E. Production (Units)	78,071	14,845
F. Exports (Units)	13,573	114
G. Capacity Utilization (E/D)	.67	.20

Given differences in capacity utilization and hence, dramatic differences in actual labor and capital productivity, the finger of suspicion points to critical differences between the two companies in *product design and development*. At the time, Hyundai Motors was prospering because of its 'Pony,' a model that had depended on imports of key components and foreign technology and design assistance, but that was still unique and not simply a localized foreign design. Daewoo Motors, by contrast, was depending on its 'Chevrolet 1700,' and later its 'Gemini'. Both models embodied GM designs (the former, American; the latter, German, after the Opel). No detailed technical comparison of the 'Pony' and the

'Gemini' is available, but consumers in the local market were said to prefer Hyundai-made cars. A major outlet for the 'Pony' was Seoul taxi drivers, who liked driving a national car. If so, this would support the Kindleberger-type argument that business costs rise with distance. Nevertheless, most analysts also attributed consumer preferences to the superior quality of the Hyundai-designed 'Pony' over the GM-designed 'Gemini' (the two cars were indistinguishable in other respects such as price and engine horsepower). The 'Pony' was allegedly more energy-efficient and cheaper to maintain and repair.¹³

If, in fact, the 'Pony' embodied a superior design than the 'Gemini', this could be attributed in Daewoo's case to chance, managerial inefficiency, or strategic trade-offs. At the time, GM was interested in developing a world car, and regarded Korea as only one site for sub-production (its commitment to Korea was much smaller than Hyundai's, as measured by investment in capacity, as Table 1 indicates). Few resources were pumped into developing Daewoo Motors' technical capabilities in product development. All the foreign technical agreements that Daewoo Motors signed (which were much fewer than those that Hyundai Motors signed) were with GM overseas affiliates. Local investment in 'R&D' (which, at the time, mainly meant engineering related to production) was also much less in Daewoo than in Hyundai. Thus, the universe of DMC's learning was both smaller and narrower than that of HMC's, which may have influenced production productivity as well as local design adaptation and improvement.

Meanwhile, Hyundai Motors was an exemplary learner of international state-of-the-art automobile practice. From the start of operations it had adopted a long-term strategy of becoming an independent, global player, an uncompromising objective that was supported by the deep pocket of its conglomerate membership

¹³Interview, Oh Wonchol, March 1995. Mr. Oh was the right-hand man of President Park Chung Hee in the Ministry of Commerce and Industry in the 1970s.

and the protectionism, preferential credit allocation, and discipline of its sympathetic government.¹⁴ HMC compensated for its own provincialism by simulating a multi-country operating environment in its technology acquisition approach. It sent engineers abroad to get hands-on experience and it welcomed foreigners in its plant as teachers. It may be said to have leveraged its local advantage by reversing the brain-drain of native Koreans who had studied in the US and who had worked in the American auto industry; it welcomed them home with high salaries and heavy responsibilities as heads of new R&D facilities. HMC even structured domestic training to transform explicit knowledge, formally acquired, into tacit knowledge, accessible only through learning by doing. For example, to acquire production capability in the shortest possible time,

even while plant construction was underway production teams rehearsed production operations by disassembling and reassembling two passenger cars, a bus, and a truck over and over to routinize production procedures, internalizing transferred *explicit knowledge* (production manuals) into *tacit knowledge*.¹⁵ When the plant was completed, workers had sufficient tacit knowledge to assemble cars with minimum trials and errors (Kim, 1996, p. 161, emphasis added).

While through much of this period Hyundai was an essentially local firm in sales and an exclusively local firm in production, it was engaged in international learning through its formal and informal links with more technologically advanced countries. Further, as it expanded sales internationally, the requirements of export markets become key stimuli for product improvements. That this

¹⁴Given that the Korean automobile industry was highly protected and oligopolistic, there was every reason to predict poor performance. Exports did not begin on a large scale until the 1980s; in 1982 the share of exports in total automobile output still equaled only 15% Amsden and Kim (1989) . In part, what kept the industry on track was government discipline of business in exchange for support. For instance, price gouging was prevented by informal government surveillance of prices. When a new model was introduced, firms were allowed to charge above world-market prices. Then they were pressured to reduce prices. The domestic prices of all local models, whatever their size, each shows a downward trend (Amsden (1994)).

¹⁵Similarly in the case of the steel industry, training took the form of workers shouting directions to one another in an open field by way of preparing for real production routines (Amsden and Kim (1989)).

internationalization of sales was internalized through wholly-owned sales subsidiaries reinforced this feedback of market information.

The case of the Korean automobile industry appears to contradict the view that learning is 'home based', drawing entirely on the demand and factor conditions of the firms' home country. But neither does it completely support our view that multinational firms are necessarily in a better position to learn than their single-country competitors. Much depends on the quality of management, global strategy, the ability to simulate a multinational presence, and the size of the domestic market. Arguably the size of the Korean market was such that it could sustain the initial growth of a new, local automobile maker but was not large enough to become the favored site of regional learning by an established multinational enterprise.¹⁶ Nevertheless, to catch up quickly with the world technological frontier after severing relations with GM, Daewoo Motors did choose the option of learning by outward direct foreign investment -- among other purchases it acquired a design firm in Britain.

An interesting test case of the ideas presented here that is now underway is the contest for dominance of the market for the new so-called Asian car. The 'lead' markets for this product, a 600-1000 cc automobile appropriate for lower to middle income economies, will be countries such as India, China, Thailand, and Indonesia, not the traditional 'lead' markets of Japan, the US or Germany. However, firms based in these traditional 'lead' markets still possess important technological and network assets, but to compete effectively in lower to middle income economies, they must pursue differentiated strategies between their primary markets and the new emerging markets.

¹⁶If the Korean government had had its way after the second energy crisis in 1979, only one car producer would have survived in Korea. But GM refused to abandon production and Hyundai Motors refused to amalgamate with GM unless it could have controlling equity.

Locally-based firms will have the advantage that the relevant stimuli are 'closer to their core', but to afford the substantial investment required for a successful next generation Asian car, they will have to be in a position to exploit this investment beyond their own boundaries. To do so effectively, they will not only have to be able to perform design and core manufacturing operations at a scale that is greater than that of individual markets, but they will also have to incorporate stimuli from some of these markets in design, etc. Local firms typically will be at a disadvantage in terms of experience and networks. Entrants in the sweepstakes include traditional Japanese players such as Toyota, Mitsubishi, Honda and Suzuki, European and US. firms, Korean firms, and new local entrants, such as Proton of Malaysia and Suzuki Maruti of India. Some of the local entrants already have or will enter into joint ventures. If our view is correct, all will have to become multinationals to succeed.

What is interesting about this contest is that it occurs on two dimensions: where the design and core production activities take place; and who will initially take the lead in undertaking them. It is not obvious that the national interest of emerging market countries necessarily lies with local firms. It may be as important for them to attract firms with complementary knowledge and network advantages. It is likely that some mix of the two will be best for maximizing spillovers that can be captured locally, through research on this issue is called for.

Conclusions

In this paper we have argued that multi-country firms that can learn by doing in a variety of settings and incorporate this knowledge into their overall knowledge base will have a competitive advantage relative to single country firms or multinationals whose learning is limited to their home base. This multipoint learning will be most important for those products and processes that are non global

in some dimensions but depend on leading edge global innovations as well. The ability of the multi-country firm to translate learning opportunities into realities depends on incentives to generate appropriate technologies and mechanisms to transfer them corporate-wide.

This view of multinational firms as multi-point generators of knowledge has important implications for policies aimed at fostering innovation and competition in low and middle income countries. Many products and process innovations relevant for these markets will require learning both in such markets and in the leading science and technology arenas of the world. Therefore, such innovations are unlikely to be made either by locally-based firms that do not 'invest uphill' technologically or by global MNEs that simply seek to exploit what they have learned in the world's primary markets.

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