KNOWLEDGE, MARKET FAILURE AND THE MULTINATIONAL ENTERPRISE: A REPLY

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Debate is an indication that an issue warrants discussion. The comments of James Love and Donald McFetridge in this issue are fine statements that articulate a received wisdom.[1] Their comments differ with each other, and these differences remind us that there is less consensus in our understanding of internalization and transaction costs than commonly supposed. If we do not address all of the commentators' specific points, it is not for lack of appreciation, but because it is our belief that a fuller vision of the terrain already mapped and that which is yet uncharted would provide a more useful basis for exploration and discovery. A listing of issues is the task of a referee, while a published debate might perform a useful task by laying out the contours of the research tradition and future.

Our article, published in *JIBS* in 1993, was one of two empirical inquiries following a third article laying out a research statement. In the first of the three articles, submitted in 1988 and published in 1992 in *Organization Science*, we argued that knowledge can be considered in terms of know-how and information.[2] There are two complicating dimensions to this description. First, knowledge, since it is both individual and shared, exists in the social relations among cooperating members in a community. This community, whether a group, firm, or network, has no a priori boundaries. Second, to the spatial dimension there is also a temporal issue, namely, how the firm develops and explores new capabilities. Though we did not examine this dimension empirically, we noted in the 1992 article that capabilities differ in terms of their intrinsic technological opportunities and their correspondence to market opportunities. In more concrete terms, we likened capabilities to the ownership of proprietary assets that provide options for future expansion and growth.[3]

Neither Love nor McFetridge develops the argument that such options for future expansion and growth are internalized because of the difficulty of writing fully contingent contracts. The dynamics of a firm are especially difficult to analyze. One vision might be that of the individual innovator who would prefer to contract

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idea is chosen, then the new owner faces a "make-buy decision." The implied regress in this analysis is only broken by positing that someone, or something called a firm, might be better at production than alternatives. It should be noted that this argument is independent of whether the issue is transaction costs (minimizing governance costs) or Chamberlain profits (maximizing revenues).

These issues are complex, and it is noteworthy that Williamson [1985, p. 141], when discussing the limits of firms, remarks:

> The foregoing makes no reference to innovation. Implicitly, product and process innovations are unimportant. Transactions are moved from markets to hierarchies as asset specificity builds up because the high-powered incentives in firms operate as a disability when adaptations to stochastic or other disturbances are attempted in a tightly bilateral trading context. How, if at all, is the assignment of transactions to markets and hierarchies altered by the introduction of process or product innovations? Unfortunately, the study of innovations is enormously complex ....

We make two observations. The first is simply that the relative transformation costs of different firms is the primary issue, not transaction costs. Since there seems to be some debate regarding the interpretation of past results, it should be noted that Monteverde and Teece [1982] found that a firm dummy had the most weight in determining the make or buy decision. Walker and Weber [1984] found that production cost differences were the primary determinant of make or buy decisions. Worth noting is that both studies focused on make-buy decisions where transaction cost considerations were likely to be salient. The studies neither analyzed the innovation decision, nor the current productive assets that were unchallenged by boundary decisions. The evidence, even in the domain most favorable to transaction costs considerations, "make-buy decisions," is consistent with a viewpoint of differential firm capabilities.

Our second observation is the artificiality of the world portrayed by the stylized decisionmaker in transaction cost theory. Innovators, managers, and workers are confronted by contractual considerations, but they are also confronted by the social world in which they find themselves. This world is not alien or external

to grounding argument in the micro-analytic details that Williamson and others have so arduously, and correctly encouraged.

The second of the empirical articles, which was submitted in 1991 and will appear in *Organization Science* in 1995 (publication acceptance has not been easy) looks at the effect of the dimensions of knowledge on the time to imitation and, in separate tests, on the time to transfer.[4] These dimensions of knowledge are significantly related to the time to transfer: the more difficult to code and teach is the knowledge, the longer the time to transfer. Knowledge is never a pure public good; transfer costs are an increasing function of its tacitness. The results did not, however, show a relationship between tacitness and time to imitation. On reflection, the research design was too simple. The capabilities of the firm are more than just manufacturing competencies, and extend to the full array of capabilities, from innovation to product delivery. Rival firms might easily imitate manufacturing, but still not be able to compete effectively due to deficiencies in other areas. An analysis of the extent to which manufacturing capabilities were diffused among firms showed that imitation tended (weakly) to be speeded by the degree to which manufacturing knowledge was common among competitors.

In the 1993 *JIBS* article (which was published after a somewhat raucous review process tempered by an understanding editor) we developed the ideas of these two other articles for positing an evolutionary theory of the MNC as a social community whose productive knowledge defines a competitive advantage. The firm was seen as a repository of knowledge that constitutes the ownership advantage of the firm. The empirical test that we performed was constructed to replicate previous work. Its strength lay in the direct measures of knowledge, an important advantage over studies that used more indirect measures.

REFLECTIONS ON ANTECEDENTS

One of the exciting implications of an evolutionary theory of the multinational corporation is its compatibility with the corpus of work in international business and management. The great advances in the theory of the international firm were made by scholars such as Penrose, Hymer, Vernon, Burenstam Linder, and

The kind of inductive theorizing based on keen empirical observations of MNC practices and operations has over time been pushed to the background by transaction cost related theories in international business. Our aim is to restore the balance by offering the development of a theory of the firm based on a traditional, empirically grounded stream of literature in international business. Instead of market failure and transaction costs determining the international expansion of firms, we favor explanations grounded in firms' skills, capabilities and their nature. The notion of the firm as a reservoir of social knowledge that structures cooperative action lies at the foundation of our thinking regarding an evolutionary theory of the MNC.

There is another tradition and a line of research that we feel is critical to the field, namely, business history. Since Chandler's work has been the fodder for many perspectives, it is instructive to note his own reflections on the theoretical importance of his histories. In relating the empirical regularities of his research contribution to different economic theories of the firm, Chandler [1992] notes the importance of "organizational capabilities" based in the collective physical facilities and human skills as organized within the firm. The learning of such capabilities requires processes of trial and error, feedback and evaluation, as well as a process of guided learning and experimentation. According to Chandler, the failure to develop capabilities of coordinating flows has been central to the disintegration of centrally planned economies.

The historical development of the organizational structures of multinational firms is also interesting. There are clear differences in the dynamic paths of multinational firms. A majority of U. S. multinationals chose the route through "international divisions" to global line responsibility [Stopford and Wells 1972]. European firms over time typically went directly from the functional "mother-daughter" structure to global divisionalized structures [Franko 1976]. When combined, the results from the Stopford and Wells and Franko studies indicate how certain characteristics of the MNCs at a specific point in time have had long-term influences on the evolution of organizational structures. The behavior of individual firms might not reflect a strict dependence on the "initial conditions" imposed by the environment, in this case the stimulus of increasingly international competition. Individual conditions matter as triggering points for change, but the influence of firm history and the networks of which firms are part must never be forgotten.

The marriage of organizational capabilities and history is easily performed within the auspices of an evolutionary theory. Nelson and Winter's [1982] concepts of skills and routines as organizational underpinnings to the dynamics of Schumpeterian competition lead to a notion of strategy as much more than the selection of product markets and technologies of production. Above all, it is the creation and maintenance of superior organizational routines that reproduce and develop the strategy and the organization over time. In the struggle to improve and innovate, firms grope towards better methods with only partial understanding of their own capabilities and of technological opportunities.

The history of Ford's expansion to Europe is not explained well by a superior ability in defining the boundaries of the firm. It is a history of a firm that garnered

a better heuristic for manufacturing than its competitors and brought this heuristic to foreign countries, especially but not exclusively to England [Wilkins and Hill 1964]. Ford's heuristic did not simply appear in the head of an entrepreneur. Mass production was an unrecognized *template* to which the experiments of many firms and individuals contributed over a long period of time [Hounshell

insure but choose instead to self-insure. Markets for insurance are notorious for moral hazard problems, as well as for product differentiation. The decision to self-insure is not necessarily a statement that the market for insurance failed, but it may imply that asymmetric information and incentives raise the costs of issuing insurance, to the detriment of both suppliers and buyers. Still, there is a fairly healthy market for commercial insurance, as there is in the sale and licensing of technology.

But insurance companies are more than just instruments by which risk is pooled. Their relative efficiencies reflect differential capabilities in "back-office" operations: the writing, pricing and processing of policies, and in the investment of the considerable cash flow earned from policy premiums. The dilemma of a Lloyds is the design of a system that preserves the organizational capital of the firm by transferring the risk to individual names. But Lloyds is not paid for bearing risk; it is paid for the organizational capabilities to identify and price appropriate opportunities.

As McEetridge points out, the transaction cost hypothesis

employer. Of course, zero-sum games exist inside a firm as well, but Hennart's point is still consistent. We just feel that such logic may have less empirical domain than its cleverness suggests.

Both McFetridge and Love are pulled to the sirens of Note 17 that bears the tell-tale sign of a response to a reviewer. In that note, we warned the reader that common labels do not indicate similar measures. Complexity is one of them. In colloquial discourse, a question such as *What do you think of Mr. X?*, might invoke the response; *He is a rather complex sort of guy,* by which it is meant that you should watch your wallet, spouse, or pet depending on the context. Complexity as a strategy of dishonest obfuscation of intent is a recognizable problem. Again, asset specificity has an added nightmarish cost to it, as the ex post horror of making investments to an individual of Borgian cunning. But asset specificity hardly seems among complex people can be painful, or lead to market failure.

We, however, were not interested in the genre of film noir. We measured complexity by the degree to which technology combined different scientific bodies of knowledge. In designing this question, we had in mind the difficulty of communication among people from different backgrounds, and the difficulty for an individual to master several sciences.

One of the common and cyclical cries of academic life is for more interdisciplinary research. It is possible that such research is scarce because of market failure among contracting parties. Devious physicists are outwitted by the topological guile of complex mathematicians. David Lodge and God know how prone academics are to cooperative failure.

There is another view. Interdisciplinary research is hard to do. Communication between adherents of different disciplines is troubled because knowledge is expressed discursively and, alas, competence and capability vary. One may not understand higher mathematics because one is not trained to understand it, or one cannot understand it ever. Incompetence is a serious impediment to the transfer of knowledge. So is the incapability of particular groups and firms to apply new production techniques.

But firms have the luxury, with a stickiness partially regulated by local labor law, to change their competence by firing and hiring. (Of course, in poorer nations, the deficiency of educational investments may result in a paucity of a trained labor force, as implied in the studies of expatriate managers that show a higher percentage of non-locals in developing countries.) The issue is thus not simply individual competence. Indeed, the migration of trained engineers from developing countries, e.g., India, China, suggests that an important aspect to the determination of personal income is the relative capability of the institutions and organizations in different countries, not just inadequacy in human capital formation.

McFetridge claims that our results are consistent both with transaction cost reasoning and with a number of empirical tests of it. In pursuing the argument, he focuses on the costs derived from transaction-specific human capital investment to transfer tacit knowledge between units of the MNC. In our thinking, direct

transfer costs are indeed influencing the choice of transfer mode. However, decisions made by the management of a multinational corporation are also concerned with exploiting a new technology in the most effective way. In a world of Schumpeterian competition firms compete on the speed of replication of new technologies, often in foreign markets. An important limiting factor on profits and growth is the speed at which imitation of the technology by competitors occurs. What causes the relative efficiency of transfer [illegible]

tion depends on the stock of previous experience. But there is another side to this depiction than the costs of absorption, as described in the technology transfer literature. Because technology transfer is a flow, the experience of making the transfer is not simply an expenditure, but may also be in the nature of asset creation. By doing a transfer, a firm lowers the costs of future transfers. By entering one country, the firm acquires the experience to lower the costs of subsequent entries. Technology cost need not be static, but may represent the forward-looking quality of experimentation and exploration in new markets.

At the risk of some dissemblage of argument, it is probably wise to make a few comments on some of the points made *ad seriatim*. In stating that the term public good has a contradictory usage, we hardly endorsed a characterization of technology as non-excludable and non-rival. There exists a burgeoning literature on the economics of ideas, and the importance of complementarities in the production and usage of such ideas. The notion of tacitness in the communication between producers and users is certainly an important element in understanding spatial location, and firm boundaries, to their joint coordination.

One criticism points to the gap between empirical results and the theoretical claims. A more parsimonious objection might be that the hypotheses are not robust to a wide range of phenomena that might be said to describe the efficiency of a firm. The tests focus on the transfer of technology, as opposed to the overall

CONCLUSIONS

We have sought to make a few points in our response:

1. A comparison to a market is a useful abstraction for understanding trade. In a production economy, the economics of transformation tend to dominate the economies of exchange.

2. The economics of transformation differs among firms due to the heterogeneity of processes by which knowledge is accumulated, and by which human interaction is communicated and coordinated.

3. Market failure is an empirical description of tested validity, but is not a necessary component of an explanation of firm boundaries and growth.

4. The image of a "decision" to internalize an activity is an artificial characterization of the determinants of what firms do. Firms tend to do what they have done before, and this inertial stock of activity is related to the experiential process by which social knowledge is accumulated.

5. The transfer of knowledge is facilitated by templates that serve as representations of the complementarities in the design of the channels of communication and structure of coordination among cooperating individuals.

6. Since the communication of social knowledge is not easily purchasable or imitated in bite (byte) sizes in the market, differences among firms may persist for long periods of time.

7. The slowness by which knowledge is accumulated puts a premium on forward-looking strategies that seek to invest in technologies and organizing heuristics that are developmentally rich and that correspond to future market opportunities.

An issue left unaddressed in our comments, and by our two commentators, is why knowledge is influenced by the boundaries of the firm. Here lies the central issue in understanding community and knowledge. We leave it as a question for another forum.

NOTES

1. Love [1995] and McFetridge [1995].

2. Kogut and Zander [1992].

3. The empirical basis for this perspective is explored elsewhere: Kogut [1991], Zander [1991], and Kim and Kogut [1994].

4. Zander and Kogut [1995].

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