Recent Writings on Competitiveness: Boxing the Compass

Richard Nelson

There is a flood of recent writing by American authors on what has come to be called the "competitiveness issue." Their focus is the weak performance over the last decade of American firms vis-à-vis foreign ones—particularly Japanese—in sectors where the Americans used to dominate. This literature is not consolidated, rather it is divided up into relatively disjoined intellectual clusters that have little contact with each other. This article reviews several of these clusters.

In one cluster of literature, individual firms are the object of inquiry. These authors are concerned with factors internal to firms that make them strong or weak. Much of this writing has emanated from scholars in business schools or engineering schools. While a few of the prominent authors have their formal training in economics, they have a reputation among economists of being somewhat "offbeat." The clear message of these writers is that American firms could do better if they simply pulled up their socks.

A second cluster is almost exclusively the work of economists. Its focus is on the macroeconomic performance of national economies and on the factors that lie behind strong or weak economy-wide performance. Within this body of writing the behavior of firms—the central subject of inquiry in the first cluster of writings—is viewed as largely determined by the macroeconomic climate in which they live. The control variables focused on by the second group are those of macroeconomic policy—e.g., government surpluses and deficits, or the looseness or tightness of monetary policy. Writers in this camp also express concern about poor American performance in areas that traditionally have been the province of the public sector, such as education.

A third body of writing (which recently has dropped out of fashion but which almost surely will return to it) is also concerned with government

policies, but with *micro*economic ones rather than macroeconomic policies, i.e., with "industrial policies." Here the focus tends to be at the level of an industry: While firms are viewed as having a considerable amount of autonomy, government is viewed as being able to influence strongly how well they do. Much of the work is comparative. As with the first group of writings, most of the authors of papers in this third group are not by economists. However, a number of economists have recently entered the fray.

It is tempting to posit that each of these clusters represents a view of one part of the competitiveness "elephant," and that if they were brought together one could see the competitiveness issue whole. I believe there is something to this argument, and presenting them in one place is a raison d'etre of this essay. However, the different views do not quite "add up" and in certain ways are at odds. Thus some of the recent writers on firms have gone out of their way to deny that macroeconomic variables such as the cost of capital have much to do with the myopia they argue possesses much of American business management. On the other hand, the lack of attention in the writings of macroeconomists to discretionary behavior at the level of individual firms reflects their strongly held beliefs that firms in fact have little room for discretion, and that the key variables are macroeconomic. Many of these economists have declared open war on those who espouse industrial policies.

For the different analytic strands to come together, one needs a way of looking at industries or industry clusters that at once recognizes that broad national factors constrain and facilitate what firms do but that the firms themselves have considerable room to maneuver. One needs to understand "comparative advantage" as to a considerable extent made rather than simply imposed by macroeconomic conditions, and that recognizes in most industries sectorally specific public programs play a vital role in their success and failure. While we are some distance from such a way of seeing competitiveness, this article will conclude with a discussion of several recent studies that have moved significantly in that direction.

Firms as Competitors

While the diagnosis of the competitiveness problem in Dertousos et al.'s *Made in America* is something of a laundry list, it covers most of the diagnoses made by writers concerned with the weaknesses of American firms.[1]

American firms are still hooked on old style mass-production methods in an era when flexible manufacturing has become the more effective mode of operation. Similarly, our hierarchical mode of organization and practice of specifying job assignments narrowly, while perhaps appropriate in earlier era, are now causes of weakness. Research and product design and development stand too distant from manufacturing and production engineering; it takes American companies much longer than the Japanese to go from conception to production, and our production costs and quality are often

inferior. More generally, we pay too little attention to production. American business managers are myopic, both in their failure to look at world rather than national markets and in their short time horizons. While the latter may have a something to do with the high cost of capital in the United States and the shortness of "patient finance," the problem has more to do with the way our managers think and the tools of analysis they are taught in business schools.

Compared with the Japanese and Germans, our blue-collar work force comes to the work place poorly trained by the public education system. This is compounded by a weakness of in-company training and re-training programs. Together this puts American firms at a significant disadvantages regarding labor skills. American firms are less willing to cooperate with each other on matters where cooperation would yield payoffs, in part because of the attitudes of managers, but also partly because government looks on cooperation with suspicion or hostility. More generally, business and government seldom work together and often are at odds.

While this long list seems to diagnose the competitiveness problem as death by a thousand cuts, one can see a smaller number of more basic diagnostic themes. Some diagnoses carry the connotation that American firms have left their old good paths and somehow gotten "lost," that American firms have forgotten about production.[2] Other writers argue that while circumstances have changed, American firms have not. The fact that competition and markets now are global is one important change that has been stressed by Porter[3] and many others. Another body of writing has developed around the linked themes of the advent of flexible manufacture, just-in-time delivery and inventory management, and the need to treat workers as long-run members of the firm in order to exploit these new procedures effectively.[4] Lazonick's recently stressed the broad advantages Japanese firms have over Americans by virtue of their ability to motivate and trust blue collar labor.[5]

Certain aspects of the way Americans do things are molded by institutions and behavior outside the firm. For example, the fact that American labor is highly mobile dampens the incentives firms have to train extensively. Other examples include the shortage of patient finance, management insecurity stemming from dependence on the stock market, the cloud of anti-trust, and concerns about American education. However, *Made in America* focuses predominately on what goes on inside firms. While other studies in this cluster may emphasize different things, this "inside the firm" focus is its hallmark, and the authors clearly believe that this is where the competitiveness problem resides.

While seldom heavy on theory, many of the writings of this genre are quite analytic. A sizable number make use of the strategy and structure framework for analyzing firms developed by Alfred Chandler.[6] A cluster of recent writing has converged on the examination of the strategies, structures, and core capabilities a firm needs if it is to continuously innovate and profit from its innovations.[7] By and large, this body of writing has

stressed the importance of investments in R&D and complementary assets (including people) that often pay off only in the long run; the need for a coherent long-run strategy that enables a firm to concentrate its attention and investments; and an organizational structure that facilitates the coordination of the needed activities and provides the appropriate inducements and rewards to those who work in and with the firm.

Recently, the more general writings in this category have been supplemented by very detailed comparative studies of firms. For example, they attempt to explain exactly how Japanese automobile companies produce higher quality cars at lower cost than most American firms[8] and how they manage to move so much more quickly from the decision to create a new design to its full-scale production.[9] These studies document persuasively that organizational and operational differences between firms in the same line of business are important factors behind their performance differences.

But in so doing, they implicitly raise the question as to why they have fallen into non-optimal ways, and whether they can really pull themselves up by their own bootstraps. In particular, the interesting argument that the economic world has changed, with competition now global, and old mass production methods and the associated ways of organizing and managing now obsolete, poses an issue on which students of management and organization are not of one mind. Can large organizations change themselves radically? If they cannot change, are they doomed to failure, with new organizations filling the space? Certainly the trouble that the U.S. Big Three auto companies are having reforming themselves indicates that radical organizational change is not easy. If they fail, who will replace them? Japanese transplants? If so, is the U.S. worse for it?

On the other hand, might it be too harsh to place all the blame on the firms themselves? Might not a good part of the problem be the economic environment in which they?

Macroeconomics

Macroeconomic writings on competition offer a quite different perspective. While the firm-focused literature sees the inability of General Motors to compete effectively with Toyota (or Texas Instruments with NEC) as the basic problem, macroeconomists—as exemplified by Hatsoupolous, Krugman, and Summers[10]—see the problem in terms of the stagnant productivity the U.S. has experienced since the early 1970s and the large government deficits which have turned the United States into a major net borrower on world markets. The firm-focused writers use statistics on industry exports and imports mainly as a way of generalizing from General Motors and Texas Instruments. Macroeconomists see the problems of General Motors and Texas Instruments as representative of the statistical population, that their performance is what one would expect in an economy where savings rates

are low and (at least during the mid-1980s) the price of the dollar is high.

Most macroeconomists presume markets are sufficiently competitive so that there is, in fact, little room for discretionary firm behavior. Firms are compelled to be as efficient as they can be. Those that are not will be killed off relatively quickly. At any time, it is highly unlikely that one will see many firms operating inefficiently. Thus the assertion that many American firms could significantly improve their performance by simply pulling up their socks addresses at best a very small part of the problem. What matters, mostly, is the macroeconomic environment in which they function.

In contrast with the writings on firms which are "theory light," the macroeconomic writings are "theory heavy," in that they make heavy use of causal connections in particular models. They argue that the short time horizons that characterize American business decisions as compared with those of the Japanese is exactly what economic theory would lead one to expect, given the high cost of capital in the United States and the lower cost (at least until recently) in Japan. The high cost of capital in turn is due to low private savings and a large public sector deficit. Our profligacy has forced us to borrow from abroad to finance the gap between private and public spending and U.S. production. From this point of view, the fact that we run a trade deficit is seen as the cause, as much as the consequence, of the high price of the dollar, which is needed to support our net import position. Our low savings rate, which is only partially offset by borrowing from foreigners, has been a principal factor behind our low rate of investment in new plant and equipment relative to Japan, and thus it is a major factor behind our slow productivity growth. In the midst of all this, it isn't surprising that many American firms are losing out to foreign ones.

Actually there are several diagnostic strings in the macroeconomists' bow. One, sketched above, is analysis of the factors behind low American investment rates, and the balance of trade deficits since the early 1980s. A second is based on analysis of the factors behind long run productivity growth. Here the low American investment rates, relative to Japan and Germany, come in. However, investment in new plant and equipment is only one of a long list of "sources of growth" considered by economists like Maddison,[11] and Baumol, Blackman and Wolff.[12] Some of these variables, such as private investment, are the result of private decisions that are influenced by macroeconomic conditions. But others, such as the quantity and quality of education or investments in public infrastructure (e.g., roads and bridges), are to a considerable extent the responsibility of government. Thus, the slowdown of growth in the United States may be at least partially the consequence of erosion of the performance of American education. Here, the focus is on public policies, rather than on what firms ought to be doing better.

A serious problem with this body of literature is that, given the analytic structure it employs, the variables it considers explain only a small portion

of the productivity growth short-fall of the U.S. vis-à-vis Japan and Western Europe. Further, they explain very little of the fall off of U.S. productivity growth since the mid-1970s.[13]

A recent line of analysis—opened up by Abramovitz,[14] and developed in various directions by Baumol et al.[15] and Nelson[16]—argues that the decades of the 1930s and 1940s saw the development of a wide range of technical advances, which were largely unexploited over that period because of depression and war. This pool of highly productive investment opportunities provided the fuel for the remarkably high productivity and income growth rates after the war in Europe and Japan as well as in the United States. As the opportunities progressively got exploited, it is not surprising that productivity growth rates dropped, as they did after 1970 in Japan and Europe as well as the United States.

However, the Japanese and the Europeans had a much bigger gap to make up. They were behind the U.S. prior to the war and their economies were badly damaged during the war. Thus, while their growth rates have also dropped since the early 1970s, they have remained relatively higher than the growth rate of the United States. In a world where there is relatively free trade and capital mobility, and technological sophistication is widespread, the U.S. advantages of the 1950s and 1960s had to be transitory. Thus, the rise of Toyota and Sony are simply particular manifestations of the general macroeconomic phenomenon of convergence.

The last quarter century has seen both convergence and a striking increase in international trade in manufactures as a fraction of total production. Economies during this recent era have been much more open than they used to be and thus much more under the influence of comparative advantage. From this perspective, the decline of American exports and the rise of imports in industries like textiles and steel—the first to bear the brunt of diminishing competitiveness—can be chalked up to the fact that the U.S. didn't have comparative advantage in these industries anyway, and that thus they naturally were the first to go as international trade became more important. A similar case can be made for automobiles.

This makes the erosion since the early 1980s in the performance of the American high-tech industry something of a puzzle, since according to this view the U.S. ought to have a comparative advantage in this sector. Macroeconomists tend to chalk this up to the bad macroeconomic conditions and policies that mark recent times. In light of the many market failures in high-tech industry, the loss of American leadership in certain areas of high technology has led economists to a somewhat confused position regarding the industrial policy debate.

The Writings on Active Industrial Policies

During the early 1980s, many writers argued that the American competitiveness problem, particularly vis-à-a vis the Japanese, was largely due to

the fact that Japan had an active industrial policy and the United States did not. Analysts in this camp envision a much larger role for government in the allocation of resources than do either the macroeconomists or the firm-focused writers.[17]

In its broadest form, the early articulations of the case for active industrial policies might be characterized as MITI envy. MITI was held forth as a profoundly effective agency, whose policies demonstrated that government can play a vital role in guiding and coordinating industrial activity, and in supplementing and complementing the market. In particular, it was argued that MITI had been extremely influential in determining the direction of the development of certain industries and technologies (e.g., steel in the early postwar era and electronics in the 1970s and 1980s) while discouraging investment and facilitating retrenchment in others (e.g., aluminum in the 1970s). Economists counterattacked by denying that MITI had much to do with Japan's rapid postwar development, arguing that Japan's very high investment rate and massive investments in human capital were a sufficient explanation. The economists also pointed out the various MITI mistakes made—e.g., not anticipating Japan's rise to dominance in automobile production and not recognizing new promising firms like Sony.

Recent scholarship has somewhat dampened the sharpness of this argument.[18] It has become clear that MITI's role was strongest in the years when Japanese industry was still far behind and when there still was strong government control over access to imports and capital. Its role has diminished significantly as Japanese firms have reached (and defined) the technological frontiers and as foreign exchange and capital markets have become liberalized. Today, there is very little support for the position that the U.S. needs a broad-gauged MITI-like organization, although some still argue that we could use more intra-industry cooperation and coordination.

What has persisted is the argument that the U.S. needs a mechanism to coordinate and support R&D in emerging new technologies (e.g., super conductivity and HDTV) and in areas where the U.S. is lagging but could catch up (e.g., semi-conductor production technology). In fact, in all of these areas the Department of Defense has stepped in; however, the advocates of industrial policy contend that the DOD is a bad sponsor, and that we need a civilian DARPA. It is argued that MITI has and still does play such a role in Japan and that this is a major reason why Japanese firms are winning out in various high-technology fields.[19] On this point, the economists now accept market failure arguments regarding R&D and related activities; however, their endorsement of an activist position is blocked by deep skepticism regarding whether government programs could be managed efficiently.

The issue of "managed trade" became prominent in the 1980s and has become increasingly contentious. While economists deny that MITI had much to do with Japan's broad economic success, they no longer deny that protection has played a role in determining the composition of Japanese

industry. Import blockage and prevention of foreign investment clearly allowed the Japanese automobile and computer industries to develop as rapidly as they did. Advocates of active industrial policy have long argued that policies like this enabled Japan's industries to grow strong, and that their protected home market gave them an initial shelter and a basis for later successful export promotion. Until recently, economists have tended to discount this latter argument.

No longer. The "new trade theory" recognizes that, if there are large up-front R&D costs (or scale and learning advantages more generally), a protected home market (and subsidized R&D) can make all the difference in determining which nation ultimately dominates an industry. Further, unlike protection and subsidy in traditional trade theory, protection in the new trade theory is not necessarily a negative-sum game (among the set of nations). On the other hand, if all play the same strategy—subsidize R&D and protect—and all play to the hilt, all will be losers. And the distrust of government action that has pervaded Anglo Saxon mainline economies since the time of Adam Smith still leads most economists to urge that such industrial policies be resisted by the United States.[20]

Nevertheless, economists now recognize that the rise of the Japanese automobile and computer industries would have been impossible without "managed trade." It is arguable that the Japanese economy is now stronger because of the presence of those industries. What if the U.S. automobile and semiconductor industry cannot survive without some protection and some help? More pointedly, if the answer to this question is "no," do we know how to provide help that will make the American economy, not simply the assisted firms, better off in the long run?

Do the Arguments Add Up; and If So, to What?

As noted at the outset of this article, it is tempting to view the three perspectives not as competing but as complementary. The recent, very-detailed comparative studies of firms demonstrate that there is much that many Americans firms can do on their own to become more competitive. The theoretical position of traditional economists—that it is safe to assume that firms are doing as well as they can—simply doesn't fit the facts and needs to be abandoned.

But on the other hand, there seems to be an almost hair shirt character to the position of many scholars of firm organization and management that environmental constraints are sufficiently loose so as not be of much interest. While the comparative studies of industries and firms in different countries certainly show considerable intra-country variability, they also usually find strong systematic similarities among firms in the same country and differences between countries in the way firms are structured, behave, and perform.[21] Firms located in a particular country are more or less stuck

with the available national (or regional) work force, tax rates, exchange rates, and trade policies that do or don't encourage exporting. And while many companies are transnational and financial markets are becoming more global, most companies are strongly affected by the financial institutions and the availability of savings in the country where they principally reside. Macroeconomic conditions and public policies matter.

At the present time, the industrial policy discussion is plagued by a certain ad-hoc character in the way particular policies are highlighted. Nonetheless, the recent debates have had one very positive effect. They have virtually destroyed—within the economics profession—the sanctity of the proposition that "by and large, if markets are left on their own, they work nearly optimally." Economists have come to see "non-convexities" and "externalities"—those old bugaboos to that proposition—as strongly present in many industries and activities, particularly in those where technical advance is important. What remains open and arguable is what kinds of government policies are likely to be effective.

National Industrial Complexes

A good part of the current impasse regarding what government should do stems from the fact that, until recently, there was no scholarly tradition of looking at industries, or industry complexes, as being mixed—private and public—systems of actors and institutions. The field of industrial organization in economics did have the national industry as its unit of observation; however, the industry was defined almost exclusively in terms of the firms that made it up and, where relevant, its government regulators.

As a result of several recent works, particularly those by Chandler, Porter, and Freeman, it is now possible to begin to see industries in a more complex way, as systems involving a mix of institutions—some private, and some public. The private institutions prominently include firms, but they also include organizations such as industry associations and scientific and professional societies. The public institutions include not only regulatory agencies, but also those that support R&D in particular fields, industry-specific training programs, clearing houses and extension services for technical information, standard setting bodies, and so on. In many industrial fields, public sector investments are needed to complement private sector investments. Privately owned airplanes land on publicly owned airfields. Private cars and trucks use public roads. Industries are often subject to special sets of laws that guide, constrain, and coordinate their operation. Large-scale commercial radio was impossible until the public sector set up ways to allocate frequencies.

This is an extremely promising route to explore further, both analytically and empirically. It should be understood not as an alternative to a focus on

firms or on the macroeconomic climate, but as a level of analysis in between and complementary to both. Similarly, it is not a rival to the scrutiny of industrial policies, but rather an orientation that provides a systematic way of understanding the interaction of private and public policies and institutions.

The nature of productive public policies and programs differs from industry to industry, which is one reason why talking about industrial policy in general seems to get nowhere. Even if one focuses on a particular activity, such as R&D support (which is a central focus of the contemporary discussion), it is becoming clear that public programs that are appropriate in farming will not be effective in electronics.[22] To a considerable extent, this reflects the fact that firms in different industries are structured very differently, and thus competition is very different in each one. It is also not clear that what is appropriate in one country will be in another, or that there is a constant over time. To a considerable extent, appropriate industrial policies are molded by macroeconomics.

All this is rather complicated. It suggests that solving the competitiveness problem is not as simple as "pulling up the management socks" or "getting the federal deficit under control." But maybe that is the way it is.

References

1. M. Dertousos, R. Lester, and R. Solow, *Made in America* (Cambridge, MA: MIT Press, 1989).
2. See, for example, S. Wheelwright, "Restoring Competitiveness in U.S. Manufacturing," in D. Teece, ed., *The Competitive Challenge* (Cambridge, MA: Ballinger, 1987).
3. M. Porter, "Changing Patterns of International Competition," in D. Teece, ed., *The Competitive Challenge* (Cambridge, MA: Ballinger, 1987).
4. M. Piori and C. Sabel, *The Second Industrial Divide* (New York, NY: Basic Books, 1984); J. Womack, D. Jones, and D. Roos, *The Machine that Changed the World* (Cambridge, MA: MIT Press, 1991).
5. W. Lazonick, *Competitive Advantage on the Shop Floor* (Cambridge, MA: Harvard University Press, 1990).
6. A. Chandler, *Strategy and Structure* (New York, NY: Doubleday & Co., Anchor Books Edition, 1966).
7. See, for example, R. P. Rumelt, "Towards a Strategic Theory of the Firm," in *Competitive Strategic Management* (Englewood Cliffs, NJ: Prentice-Hall, 1984); D. Teece, "Profiting from Technological Innovation," *Research Policy* (1986); G. Dosi, D. Teece, and S. Winter, "Toward a Theory of Corporate Coherence: Preliminary Remarks," unpublished paper, Center for Research in Management, University of California at Berkeley, 1989; R. Burgelman and R. Rosenbloom, "Technology Strategy: An Evolutionary Process Perspective" *Research on Technological Invention Management and Policy, Vol. 4* (Greenwich, CT: JAI Press, 1989); C. K. Prahalad and G. Hamel, "The Core Competence of the Corporation," *Harvard Business Review* (1990).
8. Womack et al., op. cit.
9. K. Clark and T. Fujimoto, *Product Development Performance: Strategy Management and Organization in the World Auto Industry* (Cambridge, MA: Harvard Business School Press, 1991).

10. G. Hatsupoulos, P. Krugman, and L. Summers, "U.S. Competitiveness: Beyond the Trade Deficit", *Science* (1988).
11. A. Maddison, "Growth and Slowdown in Advanced Capitalist Economics", *Journal of Economic Literature* (June 1987).
12. W. Baumol, S. Blackman, and E. Wolff, *Productivity and American Leadership: The Long View* (Cambridge, MA: MIT Press, 1989).
13. See, for example, Maddison, op. cit.
14. M. Abramovitz, "Catching Up, Forging Ahead and Falling Behind" *Journal of Economic History* (June 1986).
15. Baumol et al., op. cit.
16. R. Nelson, "The U.S. Technology Lead: Where Did It Come From and Where Did It Go", *Research Policy* (1990).
17. See, for example, R. Reich and I. Magaziner, *Minding America's Business* (New York, NY: Vintage Books, 1987); S. Cohen and J. Zysman, *Manufacturing Matters* (New York, NY: Basic Books, 1987).
18. See, for example, Goto and Odagiri, " Japan," in R. Nelson, ed., *National Innovation Systems: A Comparative Study* (New York, NY: Oxford University Press, forthcoming).
19. For a recent statement, see C. Freeman, *Technology Policy and Economic Performance* (London: Francis Pinter, 1987).
20. J. Bhagwati, *The Worlds Trading System and Risk* (Princeton, NJ: Princeton University Press, 1991).
21. See, for example, A. Chandler, *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, MA: Harvard University Press, 1990); M.E. Porter, *The Competitive Advantage of Nations* (New York, NY: Free Press, 1990).
22. For a detailed discussion, see R. Langlois and R. Nelson, "Industrial Innovation Policy: Lessons from American History," *Science*, 18 (February 1983).