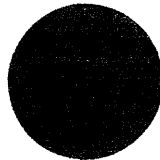


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COMPETING WITH JAPAN
IN INTELLECTUAL PROPERTY:
A STRATEGIC OVERVIEW

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The growing strength of Japanese firms in intellectual property and the difficulties experienced by American firms in protecting their intellectual property positions in Japan are well known. This paper, which has been prepared as an overview document for the Japan Program's Intellectual Property Seminar, attempts to take a larger view of the problem of intellectual property in competition with Japan. It does this by locating the "intellectual property problem" in the context of the larger "Japan problem". Equally important, it attempts to think through the strategic responses available to American firms in meeting the Japanese intellectual property challenge as part of the larger competitive challenge posed by Japanese industry.

The Nature of the Intellectual Property Challenge

Intellectual property as a competitive issue goes far beyond the narrow question of patenting and copyrights. It begins with the process by which new ideas are created, proceeds to how they are protected, and ends with how they are translated into commercially viable products. Any IP "strategy" confined to issues of IP protection alone is unlikely to be satisfactory. In this paper we will consider the three aspects of intellectual property strategy in combination.

We may begin with an inventory of trends in intellectual property, many of them adverse to the position of American firms:

(1) Japanese firms have rapidly increased their level of spending on R&D, both absolutely and as a fraction of corporate revenues.

(2) This spending is reflected both in patenting, where the leading Japanese firms have for some years been outpatenting many of their U.S. rivals in the United States, and in a torrent of new products embodying their intellectual property.

(3) Because of initiatives by Japanese firms in intellectual property, many American firms now find that they must buy intellectual property from Japanese firms or engage in technology swaps. For many firms this is a sharp departure from their previous IP position of "create and defend" and creates dilemmas on how to proceed.

(4) A number of emerging areas of technology are either so expensive to develop (hypersonic commercial aircraft) or involve such an elaborate linking of technologies ("intelligent" manufacturing systems, "intelligent" motor vehicle/highway networks) that progress toward saleable products by individual firms is difficult or impossible.

Research consortia of firms with different skills and resources may be necessary to bring such products to market. The Japanese government has made a strong effort to promote such activities and participation in Japanese-organized research consortia may

be increasingly necessary for non-Japanese firms. However, the means of participating to advantage are far from clear.

(5) The American government at the same time has been decreasing its commitment to fundamental research and support for the large research universities. The military/academic research system of the Cold-War era has been a major source of new ideas for American industry, in particular through spin-offs of new firms, and it is not immediately apparent how a new American research system, supporting the needs of American industry, will be devised.

(6) A growing number of technology areas -- communications and computers in particular -- seem to require common standards for all products sold in the market. Examples include cellular telephone, HDTV, "open" computer operating systems, and auto/highway communication protocols. The way these standards are set and specifically, whose proprietary technology they favor, may have a more powerful effect on the success of firms than which firm has the "best" technology. Historically, the Japanese government has paid close attention to this issue while Washington has hardly taken notice.

These trends are all troublesome for American industry. Unfortunately, there are much deeper problems: The U.S. and Japan differ fundamentally in their systems of intellectual property protection, their enterprise structures, and their philosophies of industrial competition. In Japan, the IP system, the enterprise structure, and the philosophy of competition are mutually supportive. In the U.S., by contrast, the variety within the enterprise structure, ranging from small start-up firms to mature giants, creates significant tensions with the IP system, with consequences we will examine in a moment.

However, the most important issue is as follows: Firms organized in the American way, large and small, pursuing an American approach to competition have played at an enormous disadvantage under the Japanese IP system, while Japanese firms have suffered no penalty in playing under the American IP rules.

To understand just why this is so, let's spend a few moments comparing and contrasting the Japanese and American IP-enterprise-competitive systems.

The Japanese IP-Enterprise Competitive System

The Japanese enterprise system emerging after World War II is most distinctive for the large industrial groupings, the fabled keiretsu, centered on a major bank and comprising a substantial fraction of the total industrial economy. However, the keiretsu structures themselves are a bit of an analytic diversion. Those large firms -- and there are many, such as Honda, Sony, and Ricoh -- describing themselves as "independent" through their lack of tight linkage to a keiretsu, typically have stable relationships with a lead bank and cross holdings of the bulk of their shares with a number of "friendly" firms. They are in no sense the widely-held, public companies which constitute the norm in American industry.¹

The leading firms in Japan, those which take responsibility for conceiving and integrating products, account for a very high fraction of the innovation and new product introductions. Practically all of them are big. Many are very big indeed. What is conspicuous is the near total absence of new, small firms counting on their ability to pioneer a new technology as their ticket to play with the large mature firms.

Indeed, the typical pattern in Japan is just the opposite of the U.S.: When a new technology is developed, it is typically within one of the largest firms. If it becomes apparent that this new technology will create a whole new industrial activity, the large single-activity firm typically spins off the new activity into a new, independent firm. However, this "independent" firm has stable cross linkages to its progenitor and other firms in the progenitor's network. An example from the early 1980s is Fanuc, which was spun out of Fujitsu as it became apparent that robotics would be a major new industry, but that success in this industry would involve activities going far beyond the development of computer hardware, which Fujitsu saw as its core expertise.

As the Japanese enterprises looked at the world in the early post-war years they knew they were behind in every area of technology. They also knew that attempting to compete with the leading American firms on the basis of scale economies and high-volume, dedicated tooling would be disastrous: Their domestic market was very small and their enterprise structure meant that there were a number of strong players in every sector. In addition, the backstopping of players by their alliance or keiretsu partners meant that few firms were likely to drop out, permitting the stable tight oligopolies typical of mature sectors in the U.S.

An additional factor was introduced in 1949 when the American Occupation deflated the economy and inadvertently produced a brief depression. The large firms attempted

¹For the best review of the Japanese enterprise structure linking firms into cross-sectoral groups, see Michael Gerlach, Alliance Capitalism, Berkeley: University of California Press, forthcoming, spring 1992.

to jettison a major portion of their workforce and encountered fierce resistance from their unions, many with a Marxist orientation. To win this battle, the major companies introduced a new system of company unions -- to break the industry-wide unions -- with elaborate, "life-time" employment guarantees and hermetic internal labor markets promoting from within. Overnight labor was converted from a variable to a completely fixed cost and managers ranked employment continuity as a leading factor in all competitive decisions.

In a decade of inspired innovation, after the crisis of 1949, a number of Japanese firms, with Toyota and Matsushita in the lead, devised a new system of industrial organization and a new approach to competition which has carried Japan to its current pre-eminence.

Space does not permit an adequate summary of what I have elsewhere termed "lean production"². The key points for this discussion are simply that a new approach to competition emerged. It consisted of a new approach to coordination of the supply chain (the vertical keiretsu)³, a new approach to distribution (the trading companies and later distribution groups) as well as new approaches to factory operations and product development⁴. Success involved quickly bringing available technologies to market, rapidly improving quality, and pushing production costs steadily down (even with constant factor costs) to gain share.

Managers in this system did not expect to knock their domestic competitors out of the race. This was most unlikely given the degree of backstopping. Rather, they hoped to move up in the league standings in their sector by gaining the largest share. Nor did they value short-term profits very highly -- they were managers, not owners after all, and ownership of the major Japanese firms was spread around in a circle to the extent that industry largely owned itself. Rather they hoped to keep foreign competitors out of their domestic market and then, as they gained experience, to knock foreign competitors out of the race in global markets. To do this it was critical to manage Japanese industry's key weakness -- technology.

²See James P. Womack, Daniel T. Jones, and Daniel Roos, The Machine That Changed The World, New York: Rawson/Macmillan, 1990, especially Chapters 2 and 3.

³For the best explanation of vertical supply groups and their marked contrast to either traditional vertical integration or arms-length, market-based purchasing, see Toshihiro Nishiguchi, Strategic Dualism: An Alternative in Industrial Societies, New York, Oxford University Press, forthcoming, 1992.

⁴For a lucid explanation of the differences in American and Japanese approaches to product development, see Kim Clark and Takahiro Fujimoto, Product Development Performance, Boston: Harvard Business School Press, 1991.

Given these features of Japanese industry and its key weakness, it is not surprising that an intellectual property regime with the following attributes was devised by the Japanese government:

1. Narrow patent filings and grants.
2. Long approval periods
3. Disclosure after a brief period (18 months)
4. Challenges before patent grant

This system tends to force technology into the open so that every Japanese firm with any energy can stay in the technology race. Even better, it puts strong pressure on foreign technology leaders seeking to do business in Japan to cross-license their technologies with the leading Japanese firms. In sum, the enterprise structure, the competitive strategies of most firms, and the intellectual property regime have been mutually supportive.

The American IP-Enterprise-Competitive System

The American IP-enterprise-competitive system could hardly provide a greater contrast within the realm of market economies. American firms at the beginning of the post-war era were:

1. Technology leaders in practically every sector
2. Stand-alone, widely-held enterprises, protected from bankers by the Glass-Steagall Act; or, small start-ups with a new technology
3. Free to jettison employees and suppliers as business conditions changed
4. Free to enter a new area of industry, using a new technology

The premise of competitive behavior was that small firms would do best to emphasize new technologies to gain entry and that large, established firms would develop the ability to duplicate any new entrant's technology but would largely compete on the basis of scale economies gained from traditional "mass" production. (For large firms to push ahead with dramatically new, proprietary technologies was a real risk because unbackstopped competitors would fall by the wayside, leaving an unacceptable monopoly.)

The traditional American intellectual property system was well suited to this philosophy. It granted patents and copyrights to individuals, offered broad grants, kept patentable material secret until patent grant, and was reasonably expeditious.

Small firms and start-ups could succeed by being good at inventing things and the ideal form of competition was to score a major technological breakthrough. This could either eliminate previous competitors (as transistors did to vacuum tube makers) or open

up a whole new industry in which the technology leader was pretty much alone due to its IP position (for example, instant photography.)

Small American firms have been highly effective in the post-war era in commercializing new technologies. However, increasingly they are running into immediate counterattacks from the vastly larger Japanese enterprises comprising the Japanese enterprise structure. In addition, with the declining interest in venture capital in the U.S., a substantial portion of venture funding for small American firms now comes from Japan. It is not hard to imagine a situation in which the know-how of these start-up firms winds up in the hands of mature Japanese firms through advantageous technology licensing in return for investment financing.

What Is To Be Done?

The fundamental presumption of this paper is, quite simply, that American firms are losing the IP contest with their Japanese rivals: they are not creating new intellectual property at the same rate, they are not able to defend their property adequately in Japan, and they are not as adroit in turning ideas into commercial products.

Typically, solutions are envisioned along two different dimensions: (1) change the Japanese IP system to look more like ours through government negotiations (the WIPO talks, the TRIPs element of the GATT, or a renewed bilateral IP negotiation between the U.S. and Japan), or (2) develop new strategies for American firms so they can win the IP competition, even when playing by Japanese rules.

In fact, it is almost certainly the case that success with either approach is enhanced by pursuing the other at the same time. Attempting to push for political solutions when American firms are known to be playing a poor IP game strains the credibility of public officials and the general public. (By contrast, demonstrated intent by the home team to play harder strengthens the resolve of American negotiators.) Alternatively, even the most successful political solution without strategic follow-up by American firms can produce, as it often has in the past, the curious result of the home team continuing to lose on the newly evened playing field.

Changing the Japanese IP System

The fundamental features of the Japanese IP system are well known but need to be briefly summarized and focussed for our purposes.

Perhaps the most important feature is narrow filing. This is well established in patents and is now appearing in copyrighting of software. Coupled with the long delays before a patent grant and the need for disclosure after 18 months, this system is optimized to force nearly universal cross-licensing. As a result, marketplace competition among Japanese firms is based on speed-to-market, finesse and scale in production, and strong distribution systems, rather than knowledge creation.

This system meshes nicely with the Japanese philosophic premise that knowledge should to be shared widely across industry to maximize social utility. It also fits the structure of the Japanese enterprise system, consisting of a few giant players in every sector supported by elaborate production and distribution networks.

Some observers have postulated that as Japanese firms exhaust the potential for knowledge acquisition and move necessarily into knowledge creation through expanded R&D activities, they will naturally wish to change the Japanese IP system to provide better protection for a major corporate asset: new knowledge. Perhaps this is so, but it seems more plausible to argue that the system will be retained very much as it is. This is because most senior managers in Japan have grown up believing that the major threat to a firm is a surprise that produces a discontinuous drop in demand for one of the firm's key products. Such surprises create enormous problems and tension not just for individual companies but for whole groups because other members of the group may be asked to deal with surplus employees from the affected company.

The current Japanese IP system guards against surprises of a technological nature, such as a major competitor making a major breakthrough and obtaining clear patent or copyright protection for an extended period. It does this by forcing cross licensing and assumes that steady growth for all firms within a sector can be obtained through international competition along the dimensions of speed-to-market, production finesse, and distribution. Thus the current system would seem to be a better bet for managers working within the existing Japanese incentive structure, even in an era of rapid knowledge creation within Japanese firms, just as it has been in the past.

If the Japanese IP system is unlikely to change without outside pressure, what changes should the American government propose? The debate seems to bog down on differences between the interests of the big American firms -- those with fully elaborated IP departments, relatively mature technologies, and the resources to flood and surround Japanese competitors in Japan if necessary -- and the small players from the venture capital, high-tech sector. The former want predictability and continuity -- gained, for example, by converting from first-to-invent to first-to-file and from prolonged to

expedited patent approval. The latter critically desire broad patent and copyright grants to keep competitors at bay until they can build up production and distribution systems able to survive against giant Japanese rivals.

The one interest all parties would seem to have in common is broad patent and copyright grants so that surrounding strategies by Japanese firms are much less effective. If this were achieved, there are a number of interesting strategic opportunities open to smaller American firms to deal with their remaining IP disadvantages, as we will see in a moment.

Playing A Better Game Under The Existing Rules

For many reasons, it is not clear that the IP rules can be changed in Japan. What's more, even if they are, there are a distressing number of examples in the 1980s of changes in the competitive rules to benefit American companies in competition with Japan which have produced little or no result in the market place. In addition, the complex nature of many new technologies seems to require collaboration between firms to gain the scale and scope needed for commercialization. This will be true increasingly whatever the formal IP systems in the U.S. and Japan. Finally, many areas of technology in computers and communications may be more effectively defended through government standard setting procedures than through traditional intellectual property techniques. Therefore, what can American firms in collaboration with American government do to increase the American level of play in the IP arena, whatever the official IP rules in Japan?

Three types of initiatives come to mind:

1. Research consortia to spur IP generation. These have already become fashionable in a number of American industries but can only work under certain conditions. Specifically, the intellectual property generated must be available to all members of the consortium but only to those members. Even more important, indeed, most critically, there must be active uptake mechanisms back in the firm to convert intellectual property into saleable products.

The end of automatic government funding of fundamental research under the spur of the Cold War may create a need for much broader research consortia than have been considered to date. Through this mechanism the smaller amounts of government funding likely to be available might be better matched with industry funds and interests.

In justifying these activities to the American government it may be important to demonstrate that the benefits do not go mainly to Japanese firms with a minor American presence entitling them to participate. A simple solution would be to link access to consortia activities and contributions to consortia funding to the size of the research

commitment of Japanese firms in the United States. Through this means firms only wishing to have an observation post in the U.S., while continuing their principal R&D activities in Japan, could be excluded.

At the same time American firms are developing more active research consortia under American aegis, there is a clear need to make better use of research consortia developed in Japan under Japanese aegis. There are obvious questions of equal access for American firms and the creation of attractive consortia in the U.S. under American aegis could provide a lever to gain access to Japanese consortia. An equally important problem concerns the uptake mechanisms back in the core of the American firms which are able to overcome the inherent problems of geography and language to put new IP findings to commercial use.

2. Alliances between large, mature firms and technology-based small firms to share technology portfolios and IP protection strategies. The critical problem for small, single-technology firms based in the U.S. is that they cannot play the flood and surround game successfully, even if they have the legal resources and funding to do so: They have only their core patents to trade off for a series of Japanese patents which may be of little use. They can either stay out of the Japanese market -- often the most attractive one for new categories of products -- or risk immediate copying of their inventions and price competition in the Japanese market which they cannot win.

Many American entrepreneurs are now realizing that a "stand alone" strategy will be very hard to sustain in the world of the 1990s. However, we have very little experience in devising "alliance" strategies whereby small, independent firms can join forces with larger, more mature firms to gain mutual advantage in negotiating with the Japanese alliance structures. The natural instinct of the large American firm is to swallow the small firm rather than fly in formation, while the small entrepreneur typically wants to ally with the larger firm only so long as it is convenient. Some type of "shared destiny" may be essential to make IP alliances work.

3. Careful attention to standard setting to favor (or at least create a neutral setting for) American firms. In more and more technology areas the key performance requirements are set by governments, even when the users of the products are entirely private citizens. Historically, American government has either been oblivious to the competitive implications of standard setting or has favored a particular standard at the urging of one energetic firm adroit in maneuvering the regulatory process. A far better method would be to explicitly include in the standard setting process the competitive implications of particular standards for American firms. Doing this would also create leverage to use in negotiating with the Japanese government about standards set in Japan.