Fallout from the Trade War in Chips

Silicon Valley companies sue to stop "unfair" Japanese tactics, saying they have already lost ground in the technological race

A clash between the world's high-tech chip makers took place this fall in a low-tech setting. On 21 October, amid the elegant decay of the International Trade Commission building in Washington, lawyers for the top Japanese and American companies traded charges in a 4-hour investigative hearing. The immediate issue was price-cutting, but American executives say the real stakes are control of the world's silicon chip markets and the future of the electronics trade.

In 1985, the American chip merchants say they have lost their position as the undisputed leaders of the electronics revolution. This year's slump in demand and the high value of the dollar have worsened their troubles. But the real threat, they claim, has been the unfair sales tactics of Japanese companies.

In response, spokesmen for the Japanese say their firms simply outclass their American rivals in economic muscle. They may seem to be acting brutally, but an unsentimental view is that the industry is going through a period of structural change. The new economics of chip making—which the Japanese have helped bring about—will favor big companies. In the Japanese view, the terrier-like firms of Silicon Valley may not be viable any longer, at least not as mass producers.

"Right now I really couldn't claim more than parity with the Japanese," says Gordon Moore, a founder and chief executive officer of Intel, a 17-year-old company viewed by some as the embodiment of Silicon Valley's brash, innovative spirit. In 1971 Intel created the microprocessor, a miniaturized computer on a chip. This product area is where America's strength lies now.

Intel launched its career in 1968 by inventing and selling random access memory (RAM) chips, an area dominated by the Japanese today. Memory chips are the easiest to mass produce, for they are relatively simple and unspecialized. In the older part of this field—static RAM's—Japan dominates the market, but not overwhelmingly. In the newer dynamic RAM's, Japan has no equal. Japanese competition has deflated prices so much that one can buy, for example, a 64K dynamic RAM chip for 70 cents, less than the cost of making one in the United States.

For this reason, Intel quit the dynamic RAM chip field last month, for good. Mostek, another major U.S. company and once the world's third largest memory chip producer, went out of business on 18 October. Others are reporting big losses.

Moore says: "Our profits for reinvestment in R&D have been removed this year" by Japanese price slashing, making it harder to keep up with the next round of competition. "We really have a major problem that goes far beyond the interests of those of us in the semiconductor industry. It strikes at the heart of the high-technology industry in the United States."

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A new era has arrived in Silicon Valley. California's young electronics companies have been willing to compete until now without leaning heavily on legal props. This is not only because the technology moves faster than the courts, according to their Washington attorney Thomas Howell, but because the U.S. chip makers "felt philosophically that the best way to solve problems is through negotiation. It's harder to work out a solution once you're locked into adversary positions." They did not want to offend Japanese customers. But all that has changed.

The Semiconductor Industry Association (SIA) of San Jose, California, was formed in 1977 to coordinate a response to the expected Japanese assault. It represents mainly the "merchant" companies, the independents who sell chips to anyone who wants to use them in a larger system, such as a computer or telecommunications device. It also includes IBM and AT&T Technologies, the two largest of the "captive" chip makers. Captives produce about one-third of the U.S. chips, almost all for internal use. They find it more profitable to box their new discoveries in whole systems rather than peddle them bit by bit.

SIA did not sue over imports until this year. Now its members have launched two major suits. In addition, a nonmember and maverick, Micron Technology of Boise, Idaho, in August got the government to investigate its case against Japanese price-cutting. Intel also has a separate suit against the Nippon Electric Company for making a "photographic copy" of one of its microprocessors. The Intel suit will test a new law the chip makers won from Congress last year giving copyright protection to the circuitry design on chips.

As they sue on several fronts, the companies are asking for White House support in quieter government-to-government talks, a version of the tough-cop, good-cop routine. These talks began in 1981 when SIA and other high-technology producers made a special plea to the White House. In 1982 a "High-Technology Working Group" met under the auspices of the President's Special Trade Representative. Under pressure, Japan made an agreement in 1983 to lower tariffs jointly with the United States and to open up the home electronics market. SIA claims that this policy worked for a matter of months, but fell apart with the collapse of demand in 1984.

The American companies cut back production, according to SIA, but the Japanese continued making chips at the same pace, cutting prices drastically, and investing in new production facilities. Following recommendations laid out by the government, the Japanese have invested in new facilities at more than twice the rate needed to supply demand. They also cut back on purchases of U.S. chips, SIA claims.

In January 1985, analyst John Lazlo, Jr., of the investment firm of Hambrecht and Quist warned that the Japanese had "greatly outspent their U.S. counterparts during 1983 and 1984 in both absolute additions to capacity and spending relative to sales." The trend would continue through 1985, Lazlo wrote, and he expected a devastating glut of chips, a price collapse, and loss of market share for U.S. companies. SIA claims that Japan's heavy investments also made

inevitable the dumping of chips (selling abroad at subsidized prices).

The chip makers' troubles were taken up last winter by the MOSS (Market-Oriented, Sector Selective) talks, a continuation of the high-tech negotiations with Japan run by the White House. Japan agreed in April to honor copyrights of U.S. chip and software designs. But aside from this there have been no tangible results for electronics.

As the talks dragged on, the American companies wheeled in some legal guns, filing an all-embracing petition in July under section 301 of the 1974 Trade Act. It charges that Japan reneged on solemn agreements to open its market. U.S. chip sales are no more than 11 or 12 percent of the total in Japan, as they have been since the early 1970's. By contrast, U.S. sales in Europe are over 50 percent of the total. SIA sees this as a prima facie case that Japan shields its companies in the home market. In October, SIA submitted a fat book of supporting documents, many translated from Japanese for the first time, showing how Japan limits imports.

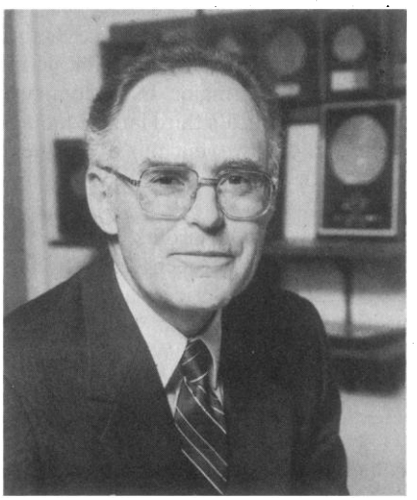
It may take the government a year to settle this and other cases, and the final settlement, even if it is in favor of the U.S. side, will not restore lost income. It will only forbid future violations.

In the narrower case that opened before the International Trade Commission on 21 October, three U.S. producers (Intel, National Semiconductor, and Advanced Micro Devices) accused Japanese companies of illegally dumping chips known as EPROM's into the U.S. market. The acronym stands for erasable programmable read-only memory. Their unique quality is that they are blank at manufacture, having their programs custom-installed for the user later. EPROM's allow great flexibility, for the program can be erased and replaced with a new one.

A key bit of evidence in the dumping case is a memo circulated in February to the Hitachi sales staff in America. "Win with the 10 percent rule," it said. It told distributors of Hitachi EPROM's to undercut competitors by offering to sell at 10 percent below any price, no matter how low. It guaranteed a 25 percent profit for any sale.

Cheap EPROM's are the thin end of the wedge, in SIA's view, part of a pattern of "sequential targeting." In this process, the Japanese begin by picking a few key, high-volume components over which to compete. Then, as the U.S. producers retreat under extreme price-cutting assaults, the Japanese companies extend the fight step by step to other items until they have swept competitors out of the most profitable areas.

This has happened in other industries, and in semiconductors the Japanese have all but taken over the field of memory chips. They have 60 percent of the U.S. market in the older static RAM's, 70 percent of the overall dynamic RAM market, and already 90 percent of the business in the most advanced (256K)



Intel

Gordon Moore, chairman of Intel, sees Japanese "parity" in the chip race.

dynamic RAM's. Japan is expected to lead the world in marketing the 1-megabit (1000K) chip this year.

In a more complex field, Japanese companies have just begun to introduce microprocessors to compete with the latest American chips. However, the Japanese may encounter difficulty here, for the logic of microprocessors is deeply enmeshed with the software that runs them. Software is very expensive to produce, and most analysts say the Japanese cannot hope to supplant the huge libraries of existing software written by American companies. It is now illegal in the United States to peddle exact copies of someone else's software or chip design. Thus, selling new microprocessors also means selling new software.

However, Japanese companies are doing surprisingly well with EPROM's. They are said to control 60 percent of the lower density market in the United States, and a rapidly growing share of the advanced (256K) market. American companies, accustomed to a steep 30 percent drop in chip prices per year, have been hit with an unprecedented 80 percent decline in 6 months. The industry has lost over $200 million in EPROM's alone. This was not a result of the general decline in demand, for EPROM sales were rising when the loss occurred.

The move into EPROM's is critical because it means the Japanese have invaded the only high-volume sales area where the Americans have a foothold. "The U.S. industry needs one of these areas in which to continue to practice and improve its manufacturing, so that the technology can be applied to the rest of the product line," says Gordon Moore. As Japan's dominance grows, the American companies may retreat to small niches in the market.

"Our continued capability as high-technology leaders and innovators is what's at stake," according to David Bostwick, a strategic marketing executive at Advanced Micro Devices. "The Japanese intention is to drive us out of the market for the most sophisticated semiconductor devices very quickly," said George Schneer, vice president for memory devices at Intel. Once the Americans have retreated, he added, "the Japanese will be free to control both the prices and the availability of future generation products." The executives also raised a national security scare, the possibility that the brains of new weapons might be filled with foreign chips.

Lawyers for the Japanese dismiss all this as self-serving. First, they say that American companies cannot sell chips easily in Japan because they cannot meet Japan's strict delivery deadlines and quality demands. The Japanese chip makers do have a slight advantage in quality, as U.S. purchasers such as Hewlett-Packard have shown. But the Americans say they have no trouble selling their most sophisticated new chips in Japan, presumably the ones for which it should be hardest to guarantee quick delivery. Those they cannot sell are the well-proved ones which the Japanese have learned to make.

Spokesmen for Hitachi, Mitsubishi, and the Nippon Electric Company argue that the Americans have foisted on the public a misleading, chauvinistic view of the competition. The American firms actually assemble their products in Malaysia, Singapore, Hong Kong, the Philippines, and in other cheap-labor nations in Latin America and Asia. At the same time, Japanese firms assemble many of their products in the United States. Further, the Japanese team says that over half the value of each chip is added in assembly. U.S. chips going through Asia might be considered the imports and Japanese chips assembled in the United States, the domestic products.

SIA vigorously disputes this point. Fabricating the chip, not packaging it, is the costly, demanding core of the business. The location of the fabrication

plant should determine the nationality of the imported chip, SIA argues. This is the orthodox view, but it appears to be open to legal challenge. (Texas Instruments fabricates memory chips at a subsidiary in Japan; does this make it part of the Japanese competition?)

Another point the Japanese make is that the Americans ignore the huge presence of IBM and AT&T Technologies. Neither is threatened by imports. Here the attorneys have hit a nerve, for many of Silicon Valley's problems are rooted in the fact that its relatively small companies do not have massive financial backing. The Japanese competitors are huge multiproduct companies, resembling IBM and AT&T more than the U.S. upstarts. They are better able to invest in automation, which helps to maintain quality. They can endure price wars better because they can subsidize their embattled chips with income from consumer products. And they can invest in the next generation of technology even when the market is depressed.

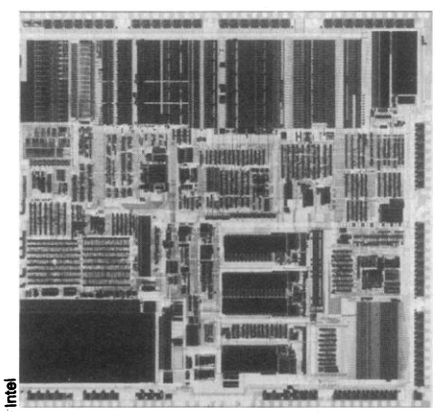
A major development that underlines the role of the big companies was Japan's decision this fall to grant IBM access to patents held by the Japanese Ministry of International Trade and Industry (MITI). In addition, IBM has just formed a joint venture with the recently privatized phone company, Nippon Telegraph and Telephone, to sell computer products in Japan. According to news reports from Tokyo, IBM may be the only American company to get access to valuable patents being generated by the Japanese "Fifth Generation" computer research project. The U.S. giant also will be able to use the discoveries generated by the highly publicized VLSI silicon chip research program of the late 1970's. IBM notes, however, that the agreement permits MITI to grant other companies access as well. MITI may not want to.

IBM says that it sought the agreement only to avoid legal problems in Japan in case some of its future products accidentally trespass on local patents. Japan sought the agreement to counteract the criticism that American companies are shut out of its market. However, what helps IBM does not necessarily benefit the U.S. chip merchants.

William Tanaka, attorney for the Electronics Industries Association of Japan, stresses the role of the big companies, for he believes they will control the future. "The [U.S.] merchant producers are caught in a cross fire between their former customers and the imports coming from Japan." These former customers—such as the U.S. automobile companies—may begin to sell chips themselves in order to finance chip-making capacity they are buying. R&D and capital investment costs are growing exponentially, he says. "In the future, the integrated producers will have the financial wherewithal, the skills, and the technology to bring to bear on the more sophisticated later generations of chips."

Tanaka's message is that the merchants' days are numbered, so why prop them up? Their demise will be a "healthy development," a move toward "greater efficiency."

This message is not without irony, says James Millstein, coauthor of a report on semiconductors written for Congress in 1982 by the Berkeley Roundtable on the International Economy. "The Japanese are no fools. To the extent that they have a strategic interest in their export drive into the American market, it is to eliminate the merchants." At home, Japanese businessmen are used to the notion of sharing the market in "a business-like, gentlemanly settlement, a form of competition we've characterized as controlled competition," Millstein says. The presence of the U.S. merchants makes it impossible to manage the market here. Consumers benefit from the resulting chaos.



Intel

A half-inch computer

Intel's new microprocessor, equal to a mainframe with over 275,000 transistors.

William Finan, an independent expert on chip innovation and occasional witness for SIA, finds the suggestion that the behemoths should take over the struggle "extraordinary." Only a few years ago, the U.S. Justice Department was threatening them with antitrust actions to keep them from stifling smaller competitors. The suits were dropped by the Reagan Administration. Finan asks, "Do we really want IBM and AT&T to go out and be our musclemen in the marketplace?"

While it is true that AT&T Technologies has begun to sell some chips, Finan says, "I submit to you that AT&T is the highest cost producer we have in the United States." Why? According to Finan, their chip-making work force is relatively old and unionized, and yields are "lousy." Parts are designed with specific AT&T products in mind, and are not keyed to outside competition. "If that's the model for U.S. efficiency," he says, "no thank you."

In seeking U.S. government help, the chip merchants can promise to bring competition and low consumer prices to the marketplace. But the essence of their plea is perhaps more emotional. For example, a spokesperson for SIA, when asked to describe the unique value of the merchant industry, began to talk about the "competitive, pioneering spirit," and "the American way."

Understandably, the merchant companies are proud of their role in the microelectronics revolution. They created it, inventing the integrated circuit itself, the memory chip, the microprocessor, and many breakthroughs in manufacturing. Would these have spread as broadly or quickly through the economy if huge integrated firms controlled the business? Probably not.

The Berkeley Roundtable found in 1982 that the presence of the merchants was "the critical stimulus" to diffusion of new electronic technology, now recognized as the key to improving industrial efficiency in many areas. As Millstein says, "These guys have no interest in backing any particular system or final product category. They back all of them and want all of them to use their products." The report concludes:"This competitive dynamism has spurred technological advance and until recently has sustained the international competitiveness of the American electronics industry as a whole."

Government officials face the difficult task of deciding whether or not they should rely on Silicon Valley's past performance as a guide to the future. Should the government try to preserve the existing structure of the industry in the hope that it will continue doing the good things it has done before? Should it merely help the merchants adapt to change? The government may decide to offer minimal protection against imports, in the view that the hard realities of the semiconductor trade have made some small companies obsolete.

More likely, the Administraton will agree with Finan, who says: "I don't think it's the law of the jungle that all firms have to become a $20-billion monstrosity to survive."—**ELIOT MARSHALL**