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BEFORE THE
SECTION 301 COMMITTEE
OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE
WASHINGTON, D.C.

Investigation of Semiconductors
Under Section 301 of the Trade
Act of 1974, as amended

BRIEF OF THE SEMICONDUCTOR
INDUSTRY ASSOCIATION

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The Semiconductor Industry Association ("SIA") represents firms which account for 95 percent of United States based merchant and captive production of semiconductors. SIA has petitioned the President pursuant to Section 301 of the Trade Act of 1974 to take appropriate action to eliminate barriers to the sales of U.S. semiconductors in Japan. The decision to seek this relief was based on a consensus of SIA's merchant and captive members.

PREFACE

The Semiconductor Industry Association (SIA) has filed a petition pursuant to Section 301 of the Trade Act of 1974 asking the President to take appropriate action to eliminate barriers to the sales of U.S. semiconductors in Japan. On August 26, 1985 the Electronic Industries Association of Japan ("EIAJ") filed a Brief which took issue with many aspects of SIA's Petition.

SIA does not view the filing of a Section 301 petition as the initiation of litigation, but the exercise of a right to petition the U.S. Government to enlist its assistance in resolving market access problems created by the policies of a foreign government. In our view the proper role of the U.S. Government is not that of an impartial adjudicator, but of an advocate of legitimate U.S. commercial interests. SIA notes that the Japanese Government has adopted such a role with respect to its own industry.

Under such circumstances, SIA need not respond to the EIAJ Brief at all. However, that Brief contained a substantial number of misleading statements and inaccurate factual assertions. SIA has prepared this submission simply to correct these statements and clear the record.

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Washington, D.C.
October 22, 1985

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EXECUTIVE SUMMARY

The Semiconductor Industry Association (SIA) has petitioned the President pursuant to Section 301 of the Trade Act of 1974 to take appropriate action to secure fair and equitable market access for U.S. firms in Japan, and to forestall dumping by Japanese producers. This Brief is submitted by SIA in response to a Brief filed by the Electronic Industries Association of Japan (EIAJ) on August 26, 1985.

I. SIA Has Stated A Case Under Section 301

Section 301 is a mechanism for enforcing U.S. rights under international agreements and upholding the international legal rights of the United States. In semiconductors, over the past fifteen years, Japan has taken actions which have nullified the effects of a series of commitments to the contracting parties to the GATT and to the U.S. government, and the effects of these breaches continue to cause harm to the U.S. semiconductor industry. This is precisely the sort of violation of U.S. international rights that Section 301 was intended to redress.

A. Japan's Record of Broken Commitments

The Japanese government has breached a long string of international commitments in this sector. (1) Japanese investment restrictions prior to 1976 contravened Japan's commitment in the U.S.-Japan Treaty of Friendship, Commerce and Navigation to provide national treatment to U.S. companies. (2) Japan's quantitative restraints on imports prior to 1975 was an open, knowing breach of its GATT commitments under GATT Article XI. (3) Although Japan's Premier Sato made a commitment in 1971 to the U.S. government to liberalize access to its semiconductor market, the Japanese government at the same time deliberately undertook a program to subvert that commitment, the so-called "liberalization countermeasures." As a result, "liberalization," when it occurred, was devoid of substance. (4) Japan made a new series of commitments to improve access to its semiconductor market in 1983; however, these commitments, like the others before them, have not been kept. (5) Each of Japan's commitments to liberalize this section has been undermined by the provision of subsidies to competing products.

The distorting effects of these broken commitments -- manifested in a chronically low U.S. share of the Japanese market -- continues to be felt today. U.S. firms' share of the Japanese market would be several times higher today had U.S. firms been permitted to invest prior to 1976. Because of lost learning and scale economies attributable to

a lower sales volume, U.S. firms' present low share of the Japanese market in turn reduces their share of all other world markets, and the Japanese producers' ability to protect their home market gives Japanese firms an unfair competitive advantage in world markets.

B. Current Anticompetitive Behavior

The evidence submitted by SIA to date supports the conclusion that current anticompetitive activities by Japanese producers are restricting U.S. firms' sales opportunities in Japan. Section 301 makes actionable the tolerance by a foreign government of cartels and restrictive business combinations. Section 301's statutory antecedent, Section 252 of the Trade Expansion Act of 1962 expressly applied to "tolerance of international cartels," and that language was subsumed in Section 301 when it was enacted in 1974. Current anticompetitive activities by Japanese producers are thus clearly actionable under Section 301.

C. Nullification and Impairment

Article XXIII of the GATT provides that a contracting party has a right to redress if any benefit accruing to it, directly or indirectly, under the GATT, is being nullified or impaired by actions of the other party. In this case, Japanese protectionism, coupled with subsidies targeted at specific product lines (such as VLSI memory devices) have enabled Japanese firms to overtake the U.S. firms in those product areas, and in some cases (such as dynamic RAMS), to drive them from the market altogether. Mostek, one of the leading U.S. producers of dynamic RAMS, ceased operations in October 1985, and Motorola and Intel have halted production of 64K dynamic RAMS citing massive losses. Such Japanese actions have defeated this country's basic expectations as to the operation of the GATT. Under such circumstances, the U.S. Government to seek redress.

II. Japan's Market Structure Remains a Serious Impediment to U.S. Sales in Japan

The evidence in this case indicates the continuing existence of market barriers in Japan despite formal market "liberalization" in 1974-75. This evidence corroborates the 1983 conclusion by the Office of the U.S. Trade Representative and the Department of Commerce to the effect that "the intent of the [Government of Japan] and its policies over the last several years has been to use other measures to offset the effects of formal liberalization" and that the Japanese semiconductor market is characterized by "formal or informal market sharing arrangements not open to foreigners."

EIAJ has not been able to address the issues raised by this Section 301 case adequately, and ignores many of them altogether. Its response consists largely of distractions -- misleading and inaccurate statistics, attacks on U.S. companies' quality and performance. For the most part this response is simply not relevant to the basic issue -- the presence and nature of market barriers in Japan.

A. Market Share Analysis

The most compelling evidence of the existence of market barriers in Japan is U.S. firms' disproportionately low share of that market. In 1984 U.S. firms held 55 percent of the European market, 46 percent of the Rest-of-World market, 83 percent of the U.S. market, but only 11 percent of the Japanese market, despite a substantial commitment to that market. Moreover, the U.S. share of the Japanese market has stagnated at around 10-12 percent since formal "liberalization" in 1974-75. Conversely, Japanese firms hold 88 percent of their home market, but have been unable to capture more than one-third of any other world market. Such lopsided differences virtually compel the conclusion that the Japanese market is not open.

EIAJ's response to this evidence has been to advance a new set of numbers purporting to show that U.S. firms actually hold 19 percent of the Japanese market, and that the Japanese share of the U.S. market is much smaller than previously thought. The U.S. Commerce Department has performed a study of EIAJ's market share figures and pronounced them "misleading and inaccurate." EIAJ's numbers completely exclude discrete semiconductors, the product area where the U.S. share of Japanese sales is smallest, and they are at complete variance from those of the World Semiconductor Trade Statistics (WSTS) system, the only generally accepted data collection system for measuring market share in this industry. EIAJ's figures also differ radically from those advanced by the U.S. Government, the Japanese Government, and various private analysts -- all of which show that the U.S. share of the Japanese market is around 10-12 percent.

EIAJ's market share numbers have no value for analytical purposes and should be seen for what they are -- a gambit to confuse the issues. Even if they were accurate, the figures would still indicate a lack of access to the Japanese market.

B. Market Structure Analysis

SIA has presented a substantial body of evidence showing that in the Japanese semiconductor industry, Japanese firms dominate semiconductor end-use markets; that dominant producers are also the dominant consumers; that

there is an extremely high volume of interfirm trade; that the dominant producer-consumers are linked through a large number of horizontal ties; and that this structure not only functions to exclude outsiders today, but was originally established with precisely that intention. These characteristics, taken together -- and particularly in light of the market share statistics -- strongly point to a pattern of collusive interfirm activity by Japanese firms to exclude outsiders.

EIAJ addresses each element of this system separately -- horizontal ties, oligopolistic structure, and so on -- and concludes that each factor, taken by itself, is not proof of anticompetitive activity and would not violate the U.S. antitrust laws. Competition analysis, however, requires that the evidence of anticompetitive behavior be viewed in its entirety, not as a collection of unrelated factors. In this case, the combination of structural characteristics supports a conclusion that Japanese firms are maintaining structural barriers to foreign products.

Anticompetitive intent has characterized the actions of the Japanese government and industry for many years. The Japanese Government's liberalization countermeasures -- a subject which EIAJ totally ignores -- were designed to create a market structure impervious to foreign products. The brief discussion which EIAJ devotes to the history of this sector -- which saw the deliberate erection of the present market structure as a response to U.S. pressure for liberalization -- not only evades the whole issue of intent but is characterized by factual assertions that are contradicted by reputable Japanese sources.

C. EIAJ Explanations for Low U.S. Sales

EIAJ contends that the low level of U.S. sales in Japan can be explained by reference to factors other than market barriers. EIAJ's alternative explanations are (1) that U.S. firms' competitive shortcomings have restricted their sales, and (2) that the Japanese market is fundamentally different in composition from other world markets, where U.S. firms enjoy a clear superiority. Neither of these theories even begins to explain the low U.S. share of Japanese sales.

EIAJ devotes a substantial portion of its rebuttal to an anecdotal account of U.S. firms' purported competitive shortcomings in Japan, which supposedly have limited their sales. However, if such factors were significantly affecting the competitive balance, that fact should be manifested in markets other than Japan -- which has not occurred. Similar anecdotes about Japanese failures can be cited (and SIA cites a number of them herein). Such anecdotes, however,

are inadequate to explain gross disparities in market share in a multi-billion dollar industry characterized by tens of thousands of individual transactions.

Anecdotes may explain why individual U.S. companies have failed in Japan, but they do not explain why no U.S. company has ever achieved a substantial share of the Japanese market. Even those U.S. firms with local manufacturing facilities and Japanese work forces, and who are equal or superior to their Japanese competitors with respect to quality, price, customer service and delivery, have never achieved a major share of the Japanese market. That fact strongly suggests the presence of market barriers.

EIAJ's argument that the large share of consumer products in Japanese end markets explains U.S. firms' low sales level in Japan is misleading and a distraction. Competitiveness in semiconductors is determined by reference to circuit application (e.g. MOS logic, MOS memory, etc.) not the particular end product -- 8 bit microprocessors, for example, are used interchangeably in consumer, computer and industrial end products. In terms of applications mix, Japan does not differ significantly from the other world markets where U.S. firms have decisively outsold their Japanese counterparts. Moreover, it is worth noting that even with respect to special devices tailored for consumer products, such as Dolby circuits, the familiar pattern holds true -- U.S. firms hold a leading market share in every major world market except Japan.

III. JAPANESE INVESTMENT LEVELS ARE NOT MARKET RELATED AND LEAD TO DUMPING

EIAJ attempts to characterize the Japanese semiconductor industry's periodic bursts of capacity expansion simply as farsighted investment behavior. In fact, Japanese investments have repeatedly overshot reasonable projections of domestic and world demand. At present, Japanese firms are investing to grow at a rate of 40 percent year through the late 1980s when long-term world demand is growing at a rate of only 16.5 percent per year. Such patterns of investment, coupled with widespread Japanese dumping, suggest an intent to dominate global markets. Japanese dumping has inflicted severe losses on U.S. producers and driven individual U.S. firms out of some product lines altogether.

IV. SIA Has Requested Appropriate Relief

SIA has several basic objectives in this case. First, it seeks an increase in U.S. firms' sales in the Japanese market, commensurate with their demonstrated competitiveness in other world markets. Such increased sales

should reflect the conclusion of long term contracts or commitments (2-3 years) between the major Japanese users and U.S. merchant suppliers. Second, SIA seeks an end to dumping by Japanese producers. This is essential to prevent dumping from eliminating a significant U.S. presence in the product areas which are essential to the long run viability of the entire industry. Finally, SIA seeks to accomplish these objectives in a manner which is responsive to the needs of the U.S. semiconductor industry's customer base. The relief requested by SIA is intended to achieve these objectives.

SIA does not, as EIAJ contends, seek a "guaranteed market share in Japan." It does seek real market access, manifested in a substantial increase in U.S. sales in the Japanese market. SIA has asked that market opening be measured in terms of increased sales, rather than Japanese "market-opening" measures, because prior Japanese "market-opening" measures have been largely devoid of substance, and, in some cases, have been subverted by Japanese "countermeasures."

EIAJ protests SIA's request for a cost-price model to detect Japanese dumping, but simply ignores the real problem such a model is intended to address -- Japanese dumping and predatory sales tactics, as has been manifested by Hitachi's so-called "ten percent rule." EIAJ is silent on how such practices are to be forestalled in the future. If the U.S. government can devise an alternative mechanism to the cost-price model which is effective in preventing Japanese dumping and predation, SIA will accept such a remedy; however, it believes that the cost-price model offers the best way to prevent dumping without at the same time impeding competition conducted according to the internationally accepted norms of business behavior.

I. THE CONDUCT OF THE GOVERNMENT OF JAPAN IS ACTIONABLE UNDER SECTION 301

SIA has stated an actionable legal case under Section 301 of the Trade Act of 1974, the elements of which are threefold. First, the Japanese government has breached a succession of bilateral and multilateral commitments to the United States and remains in breach today. The distorting effects of those breaches burden and restrict U.S. commerce at present. Second, the Japanese government encouraged in the past, and tolerates today, anticompetitive combinations and activities by Japanese semiconductor producer-consumers which are unreasonable and which burden and restrict U.S. commerce. Third, Japanese industrial policies and practices in semiconductors have deprived the U.S. of benefits under the General Agreement on Tariffs and Trade ("GATT"), and are unreasonable and unjustifiable.

A. Japan's Failure to Adhere to its International Commitments is Actionable Under Section 301

Section 301 is designed, among other things, to enforce U.S. rights under bilateral and multilateral trade agreements.¹ Japan has systematically disregarded its obligations under a succession of agreements and commitments

¹ Section 301(a)(B)(i) provides that a foreign act, policy or practice is actionable if it "is inconsistent with the provisions of, or otherwise denies benefits to the United States under, any trade agreement." Section 301(a)(B)(ii) provides that "unjustifiable" foreign acts, policies or practices are actionable. "Unjustifiable" means any act, policy or practice that is inconsistent with the legal rights of the United States. (19 U.S.C. § 2411(e)(4)(a).

made to the United States, in some cases methodically undertaking "countermeasures" to subvert these commitments.² EIAJ contends that Japan is absolved from responsibility for such actions simply because these breaches of commitment occurred in the past -- and there is nothing now the United States can do to offset the distorting effects of such practices. Such an interpretation of Section 301, if adopted by USTR, would drastically weaken the statute as a mechanism for enforcing the international legal rights of the United States.

1. Japan Has Broken Numerous Commitments
Regarding this Sector and Continues
to Do So

It is worth reviewing in this context the systematic disregard of bilateral and multilateral commitments which has characterized Japanese actions in this sector for the past fifteen years.

First, Japan's official prohibition of U.S. investment in semiconductors was maintained through 1975 in violation of the letter and spirit of the Treaty of Friendship, Commerce and Navigation between the U.S. and Japan, which provides that companies of either party shall be accorded national treatment with respect to engaging in all

² See Memorandum in Support of SIA Petition, pp. 45-65, and Appendix C, infra.

types of commercial, industrial, financial and other business activities within the territories of the other party.³

Second, Japan's quotas on semiconductor imports prior to 1975 were maintained in direct violation of GATT Article XI; EIAJ does not even suggest that a legally defensible basis existed for these import restrictions, and Japanese comment at the time indicated that the Japanese government recognized full well that its actions could not be justified under the accepted rules of the international trading system.⁴

Third, Japan violated Premier Sato's 1971 commitment to President Nixon that Japan would liberalize its semiconductor and computer market, instead implementing "liberalization countermeasures" to create a domestic market structure that would render its market-opening commitment largely meaningless, as a practical matter.⁵ The U.S. Government stated in its 1983 Semiconductor Study⁶ that as

³ U.S.-Japan Treaty of Friendship, Commerce and Navigation, signed April 2, 1953, Article VII(1).

⁴ Sankei, March 1, 1973.

⁵ The message which MITI Minister Komoto sent to Japanese organizations and financial institutions concurrently with Japan's "liberalization" of investment in computers and integrated circuits for computers should be recalled: "[I]f a Japanese model is on an equal level as a foreign model, the Japanese model should be selected." Denki, March 11, 1976

⁶ U.S. Government Semiconductor Study, submitted to the U.S.-Japan High Technology Working Group ("HTWG") July 5-7, 1983, Part V. This Study was prepared by the Office of the U.S. Trade Representative and the U.S. Department of Com-
(Footnote continued)

Japan was "liberalizing" its market, MITI was simultaneously urging Japanese consumers to "buy national" and commented that

This suggests that the intent of the GOJ [Government of Japan] and its policies over the past several years has been to use other measures to offset the effects of formal liberalization.⁷

This was not an instance, in other words, where subsequent changed circumstances induced the Japanese government to fail to adhere to a prior commitment. In this case, the Japanese Government was implementing measures designed to breach its commitment at the same time that the commitment was being made. In the entire history of Section 301, there has probably not been a more pronounced example of "unreasonable" action by a foreign government.

Fourth, Japan has not adhered to its 1983 commitment to improve access to its semiconductor markets. In 1983, the governments of Japan and the United States entered into a series of bilateral accords designed to reduce trade friction in high technology. It was agreed that

The Government of Japan should encourage Japanese semiconductor users to enlarge opportunities for U.S.-based suppliers

(Footnote 6 continued from previous page)
merce after an exhaustive "Sectoral Analysis" of bilateral trade problems in the semiconductor industry. It provided the factual basis for the U.S. government's position in obtaining the Japanese market access commitments embodied in the Semiconductor Recommendations.

⁷ Ibid.

so that long term relationships could evolve with Japanese companies.⁸

Such encouragement did occur briefly, in the immediate aftermath of the agreement, but was not continued, and, in the event, proved to be ineffective. U.S. firms report that few, if any, long term relationships have developed with Japanese companies since 1983, and the U.S. share of Japanese sales is now actually declining.

Fifth, the Japanese Government has apparently failed to adhere to its in 1983 pledge to "vigorously [safeguard] the rules of the marketplace and [prevent] anti-competitive or predatory practices."⁹ There have apparently been no actions, vigorous or otherwise, undertaken by the Japanese government to implement this commitment. American firms have complained for many years of anticompetitive practices in the Japanese semiconductor market and we are unaware of any Japanese government effort to investigate these issues.

Sixth, the Japanese government is continuing to pour financial assistance into the semiconductor industry in the form of low interest loans, R&D subsidies, and preferential tax advantages directed at product sectors which are

⁸ Recommendations of the U.S.-Japan Work Group on High Technology Industries--Semiconductors ("Semiconductor Recommendations") Section I.3.(1). The full Recommendations are attached to SIA's Petition.

⁹ Semiconductor Recommendations, Section I.3.(5)

directly competitive with U.S. firms. In some product areas, such as dynamic RAMS, the net result has been disinvestment by U.S. companies. This assistance nullifies and impairs the benefit of concessions gained under the GATT, and is actionable pursuant to GATT Article XXIII.¹⁰

Upon reviewing the history of Japanese performance in this sector, it is difficult to escape the conclusion that declarations of liberalization have occurred only in response to U.S. pressure rather than as a direct consequence of Japan's obligations under bilateral agreements or as a member of the world trading community. Commitments to "liberalization" and "greater market access" have been made at those junctures where accumulated frustration in the United States resulted in serious pressure on Japan. At these points, Japan has given commitments as a means of dissipating U.S. pressure; but as the U.S. Government, in the belief that it has "solved" the problem by securing such agreements, has turned its attention to other matters, the commitments have been ignored and there has been a return to

¹⁰ Although SIA is asking the U.S. Government to enforce U.S. rights under the GATT, it is not asking the Government to seek final arbitration pursuant to the GATT because of the delays and uncertainties which would surround such an action. Nevertheless, if U.S. rights under the GATT are violated, such violations are actionable per se under Section 301.

business as usual.¹¹ Over the years, as this pattern has recurred, the U.S. semiconductor industry's world market position has progressively eroded. In the most recent of a series of disinvestment decisions by U.S. firms, on October 14, 1985, Motorola and Intel announced the permanent halt of production of 64K DRAMS, citing "severe price erosion," and on October 17, 1985, United Technologies announced that its Mostek subsidiary -- one of the ten largest U.S. producers of semiconductors -- was ceasing all operations.¹²

If USTR finds that Section 301 cannot be used to enforce the rights of the United States under such circumstances, a precedent will have been established that other nations need not deal with this country in good faith or

¹¹ The issues raised by SIA in its present petition were thoroughly explored by the U.S. Government in 1982-83, and the Government concluded that Japanese practices were restricting U.S. access to the Japanese market. Japanese commitments given in 1983 to resolve the issue were not fulfilled, and SIA has filed this case to ask the U.S. Government to enforce those 1983 commitments. The U.S. Government has now opened a de novo inquiry of the same factual issues that it investigated and resolved in 1983. Japan's delay of effective market access appears to have been rewarded, inadvertently, by the U.S. Government, since a prompt and effective response to Japan's failure to adhere to its 1983 commitment has not been forthcoming.

¹² Washington Post, October 18, 1985; Electronic News, October 14, 1985. An Intel executive said that the company's departure from dynamic RAMs was a "definite decision" that should be seen as permanent. National Semiconductor had earlier abandoned plans to produce 64K DRAMS. 64K DRAMS are currently the subject of an antidumping complaint by a U.S. producer, Micron Technologies, against Japan.

take their commitments to us seriously -- such commitments can be avoided, in practical effect, through the implementation of "countermeasures," or simply by ignoring them as U.S. government pressure slackens. The more effective the countermeasures, the less necessary it will become to maintain them into the present. If the present case is found not actionable, the President's authority to deal with such instances will have been interpreted out of existence.

2. Japanese Actions Affect the U.S.
Semiconductor Industry Adversely Today

Japan's long string of broken commitments in the semiconductor sector continues to "burden or restrict" U.S. commerce today. The Japanese government employed protection (in breach of bilateral and multilateral agreements) to enable its "infant" semiconductor industry to mature, and eventually, in some product lines, to achieve a commanding world market share. U.S. firms, denied full entry to the Japanese market -- the world's second largest -- remain marginal suppliers in that market, and are now seeing their U.S. market position erode in the face of Japanese dumping.¹³ Mostek, one of the leading U.S. merchant semi-

¹³ U.S. producers have filed antidumping complaints against Japan in 64K DRAMS (64K Dynamic Random Access Memory Components From Japan, ITC Investigation No. 735-TA-270; ITA Investigation No. A-588-503) and in EPROMs (Erasable, Programmable Read Only Memories (EPROMs) From Japan, ITC Investigation No. 731-TA-288, ITA Investigation No. A-588-504). In 64K DRAMS, the U.S.I.T.C. has already made an affirmative preliminary finding of material injury. There are also two ongoing antitrust investigations of Japanese semiconductor
(Footnote continued)

conductor producers, terminated operations last week, and two weeks ago, Intel and Motorola announced the permanent termination of their production of 64K DRAMs.

A number of specific "burdens and restrictions" on U.S. commerce reflecting Japanese violations of commitments can be identified. Most importantly, the Japanese market structure which was put in place pursuant to MITI's policies prior to 1974-75 remains, in its essentials, in place today and acts as a continuing impediment to U.S. sales. The U.S. Government concluded in its 1983 Semiconductor Study that

the fact that Japanese semiconductor manufacturers have tended to specialize in certain areas and to supply each other suggest, formal or informal market sharing arrangements not open to foreigners.¹⁴

The companies which constitute this structure are being supported at present by subsidies and soft loans from the Government of Japan.

Secondly, the effects of Japan's failure to provide national treatment for U.S. companies seeking to invest prior to 1976 are still being felt today. A 1985 study

(Footnote 13 continued from previous page)
manufacturers. Micron Technologies has filed a private antitrust suit against six Japanese manufacturers of 64K DRAMs and their U.S. subsidiaries (Micron Technology Inc. v. Hitachi Ltd; Hitachi America Ltd., et. al; United States District Court For the District of Idaho, September 6, 1985. Civil Action No. CIV 85 1329). The Justice Department has also initiated its own investigation into Hitachi Corporation's EPROM pricing practices.

¹⁴ U.S. Government Semiconductor Study, op. cit. 1 Part V.

prepared for the Office of the U.S. Trade Representative concluded that

Because of Japanese restrictions on direct investment, the U.S. share of the Japanese market in the 1960s and 1970s likely was about half of what it would have been had American firms been able in that period to establish marketing and production facilities in Japan.¹⁵

EIAJ points out in its submission to USTR how such past Japanese market barriers have had a current injurious effect on U.S. companies. In explaining why U.S. firms' market share in Europe is presently much larger than its current share in Japan, EIAJ notes that U.S. firms invested in Europe in the 1950s and 1960s:

In Europe, American companies have the natural advantage of being local manufacturers who enjoy a substantial head start over the Japanese, having become firmly established in the European market through local investment many years before Japanese companies entered that market.¹⁶

During the period cited by EIAJ, U.S. investment was prohibited in Japan.

¹⁵ Quick Finan and Associates, Analysis of the Effects of Targeting on the Competitiveness of the U.S. Semiconductor Industry (May 30, 1985), V.13 (Hereafter, "Quick/Finan Study.") p. iii. (The Executive Summary of the Quick Finan Study is reproduced in Appendix D *infra*.) Similarly, the U.S. Office of Technology Assessment commented in 1983 that "In concert with restrictions on investment, a variety of protectionist measures limited export shipments by American firms. The shares of the Japanese semiconductor market held by U.S. manufacturers thus remain far below those in other industrialized countries." OTA, International Competitiveness in Electronics (1983), p. 140

¹⁶ EIAJ Brief at 25.

Finally, Japan's protected home market continues to afford its producers a competitive advantage in other world markets as a result of scale and earning economies flowing from added sales volume in Japan. The Quick/Finan Study, prepared for the Office of the U.S. Trade Representative, quantified this advantage with a mathematical model, concluding that for each 5 percent gain in their sales volume in Japan, U.S. producers' share of the U.S. market would increase by 2.8 percent.¹⁷

B. The Japanese Government's Tolerance of an Anticompetitive Market Structure is Actionable Under Section 301

The information submitted by SIA to date provides a sufficient evidentiary basis for a conclusion that current anticompetitive activities by Japanese firms are restricting U.S. firms' access to the Japanese market. Japanese government tolerance of such practices, and its continuation of financial aid to the firms in question, is "unreasonable" under Section 301.¹⁸

In this instance the government "act, policy or practice" in question is tolerance of anticompetitive com-

¹⁷ Quick/Finan Study at v.13.

¹⁸ The term "unreasonable" means any act, policy or practice which, while not necessarily in violation of or inconsistent with the international legal rights of the United States, is otherwise deemed to be unfair and inequitable. The term includes, but is not limited to, any act, policy or practice which denies fair and equitable market opportunities. 19 U.S.C. § 2411(e)(3).

binations or cartels by the Japanese government, which denies fair and equitable market opportunities to U.S. firms and which burdens and restricts U.S. commerce. Section 301 is broadly drafted -- it does not, by its terms, expressly apply to any particular foreign act, policy or practice, but is intended to apply to a wide range of such actions. However, its statutory predecessor, Section 252 of the Trade Expansion Act of 1962, called for Presidential action whenever a foreign country or instrumentality

engages in discriminatory or other acts
(including tolerance of international
cartels) or policies unjustifiably re-
stricting United States commerce...
(emphasis added)

Congress dropped the parenthetical term "(including tolerance of international cartels)" when it enacted Section 301, but it made it clear that the broader and more general language of the new statute was designed to expand -- rather than to narrow in any respect -- the scope of Presidential authority. The Senate Finance Committee stated that Section 301

[W]ould broaden the President's authority to counter foreign actions adversely affecting U.S. exports in terms of the range of foreign practices he may act against and the trade measures he may impose.¹⁹

¹⁹ Similarly, the House Ways and Means Committee stated that Section 301 "expands existing Section 252 of the Trade Expansion Act of 1962 regarding responses to unjustified or unreasonable import restrictions." In the hearings on the House version of Section 301, U.S. Special Trade Representative for Trade Negotiations testified that

(Footnote continued)

statements indicate that the term "including tolerance of international cartels" was subsumed in the broader and more general language of Section 301. Congressional intent to include cartels within the scope of the statute is underscored by the Senate Finance Committee's comment that

The Committee intends that [the powers under Section 301] be exercised vigorously to insure fair and equitable conditions for U.S. commerce. Foreign discrimination against U.S. commerce includes a multitude of practices such as...restrictive business practices [and other nontariff trade barriers]...which have been amply documented in studies such as the four volume U.S. Tariff Commission Nontariff Barrier work completed for the Committee on Finance. (emphasis added).

In the study referred to, "restrictive business practices" are defined as trade barriers created by private organizations, usually of two types:

- (1) those engaged in by the collective restraint of competition by independent organizations (cartels), and
- (2) restrictions resulting from concentration of economic power (multinational corporations) or control in one organization.

(Footnote 19 continued from previous page)

"Section 301 of the Trade Reform Act ... strengthens and broadens the authority to take retaliatory action to safeguard United States interests against unjustifiable or unreasonable foreign trade practices which impair the value of trade commitments by foreign countries, displace competitive United States products at home or abroad, or otherwise burden, restrict, or discriminate against United States commerce."

In the present case, the Japanese government's complicity goes considerably beyond mere "tolerance" of a cartel; it was instrumental in encouraging anticompetitive combinations of semiconductor producers as a "countermeasure" to the formal liberalization of the Japanese semiconductor market. MITI pressed the leading makers of integrated circuits to form a cartel in 1971-72 to respond to potential U.S. competition.²⁰ MITI's liberalization countermeasure subsidies in 1973-74 were designed to foster a division of labor in product development, integration of the companies' activities in production and sales, and establishment of a "counterattack structure" prior to liberalization.²¹ Japanese companies today are simply perpetuating MITI's past explicit policies today, with the Japanese Government's tacit consent.

This year, the Senate Finance Committee reported out legislation which would require the President to utilize Section 301 against Japan in sectors where unfair trade practices are restricting the sale of U.S. products.²² The Finance Committee explicitly cited semiconductors:

²⁰ Nihon Kogyo, January 8, 1972.

²¹ See Memorandum in Support of SIA Petition, pp. 52-58, and Appendix C, *infra*.

²² S.1404, Requiring the President to Respond to Unfair Trade Practices of Japan.

In the case of semiconductors, the Japanese market is dominated by a small number of Japanese electronics companies which both produce and consume most of Japan's semiconductors. These firms also dominate most semiconductor end-product markets; procure the bulk of their semiconductors from each other; are linked by a large number of horizontal ties with respect to research, development and, in some cases, production and rates; and characterized by a strong "buy national" bias; and have a long history of collusive activity intended to part to exclude foreign products. This oligopoly in Japanese semiconductors was achieved not just by protecting the infant industry, but by restricting entry of Japanese companies into the semiconductor industry to large, established producers, encouraging the division of product markets, cooperation in research, development, production and sales, and pressuring semiconductor consumers to "buy Japanese". This system of interlocking interfirm ties in semiconductors, now well-entrenched, constitutes a major barrier to U.S. semiconductor sales in Japan. (emphasis added)

The Finance Committee -- which was instrumental in drafting the original language of Section 301 -- clearly felt that the type of foreign conduct at issue in the semiconductor case was actionable under Section 301; the issue which it confronted was not whether Japanese market barriers in semiconductors were actionable, but whether the Executive would have the will to enforce U.S. rights through the use of existing statutory authority.²³

²³ The Congressional Budget Office examined S.1404 and concluded that "The bill would not grant the President any new powers, but would require action under the provisions of existing laws." Rudolph G. Penner, CBO Director, to Sen. Bob Packwood, June 25, 1985.

A finding by USTR that Japanese anticompetitive practices in microelectronics are not actionable would not only narrow the applicability of Section 301 in a manner contrary to the mandate of Congress, but would demonstrate to our trading partners an effective mechanism for denying U.S. firms market access with impunity -- the creation of an anticompetitive market structure.

C. Japanese Government Policies in the Semiconductor Industry have Nullified and Impaired U.S. Rights under the GATT

Under the GATT system, participating nations ("contracting parties") have agreed to enter into successive rounds of reciprocal tariff reductions with the expectation that such concessions will result in mutual benefits, in the form of increased trade opportunities. The framers of the GATT recognized, however, that if a contracting party took actions which fundamentally deprived another party of the benefits which that party reasonably anticipated when it entered into tariff concessions, the aggrieved party had a right of redress. That right is embodied in GATT Article XXIII, which provides that if the effects of a national policy are (1) to "nullify or impair" obligations assumed under the GATT, or (2) to cause "serious prejudice" to the interests of other countries, the adversely affected countries had a clear right to take remedial action under the applicable provisions of international law.

In the present case, Japanese import restrictions (formal and informal) have nullified the benefit to the U.S.

of Japanese tariff concessions which the U.S. bargained for and obtained through its own tariff concessions. In fact, Japanese subsidies not only nullified the effect of tariff concessions, but resulted in the creation of a whole new product generation and ultimately, the erosion of large segments of a a key U.S. industry through Japanese dumping - - a result reflecting "serious prejudice" to U.S. interests. The current disinvestment by U.S. firms in some commodity memory product areas -- a direct consequence of Japanese protectionism and aid programs -- clearly represents a defeat of this country's basic expectations as to the operation of the GATT.

Article XXIII provides a basis under which any GATT contracting party can complain about the actions of any other country which nullify or impair benefits under the General Agreement. It sets out a procedure whereby any contracting party can seek redress if any benefit accruing to it, either directly or indirectly, under the General Agreement is being nullified or impaired, or that the attainment of any objective of the GATT is being impeded as a result of:

- (a) the failure of another contracting party to carry out its obligations under the GATT, or
- (b) the application by another contracting party of any measure, whether or not it conflicts with GATT, or
- (c) the existence of any other situation. Among the objectives of the draftsmen was to provide any con-

tracting party with a means to ensure "continued reciprocity and balance of concessions in light of changing circumstances."²⁴ The concern was to ensure that any country could claim nullification or impairment in the event that its basic expectations as to the operation of the General Agreement were defeated by action of another party or by other "situations."²⁵

In discussing what was to become GATT Article XXIII, some delegates to the preparatory conferences objected to its sweep. The majority, however, recognized that it would be inadvisable to limit in advance the types of measures to which a country would take action under the GATT to maintain a fair balance of concessions. Among the possible causes for Article XXIII action which were discussed either by the drafters of the GATT (or the Havana Charter, where the language of Article XXIII was first drafted) or which have provided the basis for an actual Article XXIII proceeding were (1) anticompetitive behavior by an industry in a contracting party²⁶ and (2) subsidization of an industry.²⁷

²⁴ U.N. Doc. EPCT/C.11/PV,12, at 13 (1946).

²⁵ See R. Hudec, The Gatt Legal System and World Trade Diplomacy (Praeger, 1975) ("Hudec").

²⁶ The preparatory work on the Havana Charter (or ITO), which was to provide the basis for the GATT, leaves no doubt as to the broad scope of what later became Article XXIII of the GATT. As cited in Hudec's study of the GATT legal system, the Australian delegate to the drafting session proposed that the obligations of the Commercial Policy Chapter of the ITO be expressly conditioned on the achievement of

(Footnote continued)

(Footnote(s) 27 will appear on following pages)

The Japanese Government's semiconductor policies are actionable under Article XXIII by the United States. First, as already noted, formal Japanese restrictions on imports and investment denied U.S. firms market opportunities in Japan, and the effects of those restrictions is still being felt today. Second, the Japanese Government continues to tolerate an anticompetitive market structure which it helped to erect and which remains a barrier to imports. Third, the Japanese semiconductor industry has been heavily subsidized for over fifteen years by the Japanese Government, and these subsidies have enabled the Japanese industry to overtake U.S. firms in areas which were the subject of government aid, and in some cases, drive them from the market altogether.

For example, between 1975 and 1980, MITI and NTT subsidized major R&D projects to enable the leading Japanese producers to produce VLSI devices.²⁸ MITI extended addi-

(Footnote 26 continued from previous page)
the ITO Charter's broader objectives, so that a government might be excused, in whole or in part, of commercial policy obligations if these objectives did not materialize. The proposed ITO charter included provisions on restrictive business practices. The drafting conference agreed to accommodate Australia's concern in the nullification and impairment section of the Commercial Policy Chapter of the draft charter. See Hudec at 34.

²⁷ See Chilean complaint against Australia; GATT, 2 BISD 192 (153).

²⁸ These aid programs were thoroughly investigated by the U.S. Government in its 1983 Semiconductor Study, prepared for the High Tech Working Group Sectoral Analysis. (Pertinent excerpts from that study are reproduced in Appendix E.)
(Footnote continued)

Figure 1

Japanese Government Subsidies for Semiconductor R&D

(Billion yen)

	<u>VSLI Project</u>		<u>Other Programs</u>	
	MITI	NTT	MITI	NTT
1976	5	12		
1977	9	23		
1978	10	23		
1979	7	23		
1980			1	14
1981			5.4	14
1982			5.2	14
1983			7.7	14
1984			7.7	14

Source: Quick, Finan Associates, An Analysis of the Effects of Targeting on the Competitiveness of the U.S. Semiconductor Industry (1985)

Prepared for the Office of the U.S. Trade Representative

tional aid through the Japan Development Bank, and NTT jointly developed prototype devices and enabled the Japanese firms to overcome technological hurdles to their commercialization.²⁹ In 64K and 256K DRAMs, both of which were commercialized as a result of this effort,³⁰ Japanese pricing has largely driven U.S. companies from the market, a result which the U.S. industry has been warning the U.S. Government would occur since the late 1970s, when awareness of Japan's VLSI programs began to spread.³¹ A new generation of comparable subsidy programs is under way today.³²

(Footnote 28 continued from previous page)

The MITI and NTT VLSI efforts are extensively documented in SIA's Japanese Protection and Promotion of the Semiconductor Industry (1985) and The Effect of Government Targeting on World Semiconductor Competition (1983).

²⁹ Japan Economic Journal, May 2, 1978; Japan Telecommunications Review, January 1979; Nikkei Sangyo, February 8, 1980.

³⁰ The NTT VLSI project produced a prototype 64K DRAM in 1977 and a 256K DRAM in 1980 (Japan Telecommunications Review, January 1979; Technocrat, April 1980). As the U.S. Government commented in 1983, "NTT transferred technology for 256K RAM devices to three major Japanese firms at no cost." (U.S. Government Semiconductor Study, Part IV.A.iv.)

³¹ A U.S. Government Summary of Japanese subsidy programs is reproduced in Appendix E. In 64K DRAMs, a number of Japanese executives made statements to the effect that their firms were selling below cost. One stated that "When you are still making inroads in a market you can't afford the luxury of making money." (Business Week, May 23, 1983.) A number of U.S. firms, including Motorola and Intel, are disinvesting in DRAMs, and some U.S. firms have indicated that they never made a profit on the 64K DRAM. (Electronics News, October 14, 1985). Mostek, one of the leading producers of DRAM, ceased all operations in October 1985 (Washington Post, October 18, 1985). In 256K DRAMs, the next generation dynamic RAM, Japanese firms hold an estimated 90 percent of the world market.

³² See Nihon Keizai, July 2, August 3, August 10, 1984
(Footnote continued)

The basic concept of "nullification and impairment" is that a nation cannot grant a concession while at the same time granting subsidies or taking other actions which have the practical effect of withdrawing the concession. In this case, the U.S. reduced its own tariffs but received little in return -- Japanese tariff reductions were nullified by "liberalization countermeasures" and other subsidies. Japanese subsidies enabled Japanese firms to create a new generation of competing products in a protected environment so that, in effect, despite Japanese tariff concessions, little market existed in Japan for U.S. products.³³ Moreover, ultimately Japanese subsidies contributed to the erosion of substantial segments of the U.S. industry -- a result wholly unanticipated when the U.S. entered into reciprocal concessions with Japan.

In Article VI(1) of the GATT, the contracting parties recognized that dumping was to be condemned if it

(Footnote 32 continued from previous page)
(reproduced in SIA's Japanese Government Promotion and Protection of the Semiconductor Industry).

³³ The GATT Subsidies Code explicitly recognized that a subsidy could, under some circumstances, lead to "nullification and impairment" for purposes of Article XIII. Subsidies which may have such effects include R&D assistance and loans of the sort extended by the Japanese Government to the semiconductor industry (Article 11:3 of the Subsidies Code.) In the present case, nullification and impairment are much more evidence than in the Chilean case. In that case, a subsidy merely gave Australian producers an advantage, defeating Chilean expectations at the time concessions were made. In this case, subsidies have culminated in the destruction of actions of the U.S. industry.

caused material injury.³⁴ Japanese industrial policies have stimulated long run levels of investment unrelated to market demands repeatedly culminating in dumping.³⁵ Article VI not only gives the contracting parties a right to respond to dumping, but implies that they will not create circumstances which make dumping inevitable. That inference, which clearly was an expectation the U.S. had when it entered into its GATT commitments, has been defeated by Japanese industrial policies in this sector, which have repeatedly led to dumping. Under such circumstances, the U.S. has a right of redress under Article XIII.

Japanese policies which nullify and impair U.S. rights under the GATT are "unjustifiable" for purposes of Section 301 because they are inconsistent with the international legal rights of the United States, but they are also "unreasonable" for purposes of Section 301. Although the term "unreasonable" is sufficiently broad to embrace foreign acts, policies and practices which are not necessarily inconsistent with U.S. international legal rights, foreign

³⁴ A 1955 Working Party report adopted by the contracting parties stated that "In connection with the effect of Article VI on the practice of dumping itself, they agreed that it follows from paragraph 1 of Article VI that contracting parties should, within the framework of their legislation, refrain from encouraging dumping, as defined in that paragraph, by private commercial enterprises". GATT, 3d Supp. BISD 223 at para. 4 (1955).

³⁵ SIA Memorandum, pp. 76-84; see also The Effect of Government Targeting, pp. 15-62.

practices which do in fact violate those rights are obviously unreasonable -- the violation itself is a per se indication of unreasonableness.

II. THE JAPANESE MARKET STRUCTURE OPERATES AS A BARRIER TO U.S. SEMICONDUCTOR SALES TODAY

SIA presented substantial evidence with its Petition that the Japanese market structure in microelectronics, dominated by a number of major semiconductor producer-consumers, is operating as a barrier to increased U.S. sales today.³⁶ EIAJ contends, however, that

Denial of market access in Japan is a non-issue. The Japanese market is open to competition from all sources.³⁷

Figure 2 offers a schematic view of SIA's evidence on this subject and EIAJ's response. As can be seen, EIAJ failed to address some issues. Its manipulation of market share figures departs from accepted methodology and arrives at misleading and inaccurate conclusions which differ not only from those of SIA but of other authorities, including the U.S. and Japanese governments. EIAJ's lengthy discussion of U.S. firms' alleged performance shortcomings (pp. 11-24) does not explain why such problems translate into a low market share only in Japan, not in other world markets. Most significantly, however, EIAJ repeatedly states that SIA has produced "no evidence" of its allegations. It is worth reviewing, therefore, the evidence which SIA has presented, and EIAJ's response -- or lack of response -- to it.

³⁶ SIA Memorandum pp. 10-75.

³⁷ EIAJ Brief, p. 110

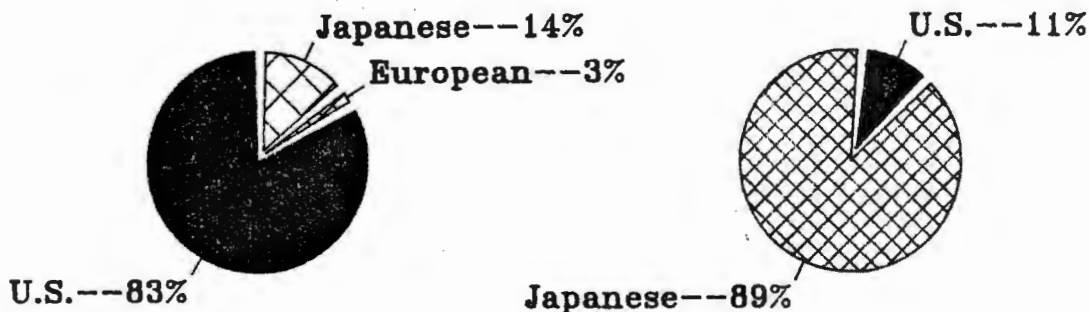
Figure 2

Synopsis of SIA/EIAJ Positions on Japanese Market Barriers

<u>SIA Evidence of Market Barriers</u>	<u>EIAJ Response</u>
* Gross disparity in market shares.	-- Advances wholly new and unfounded set of statistics. -- Blames low U.S. share on U.S. firms' failings. -- Characterizes Japan as "unique" market.
* Japan's history of protectionism.	-- No response
* "Liberalization countermeasures" were intended to create barriers.	-- No response
* Present Japanese market structure has characteristics which, <u>taken together</u> , work to restrict imports.	-- Analyzes each aspect of market structure <u>separately</u> , concluding no problem exists: -- Says there is no evidence of present collusion.

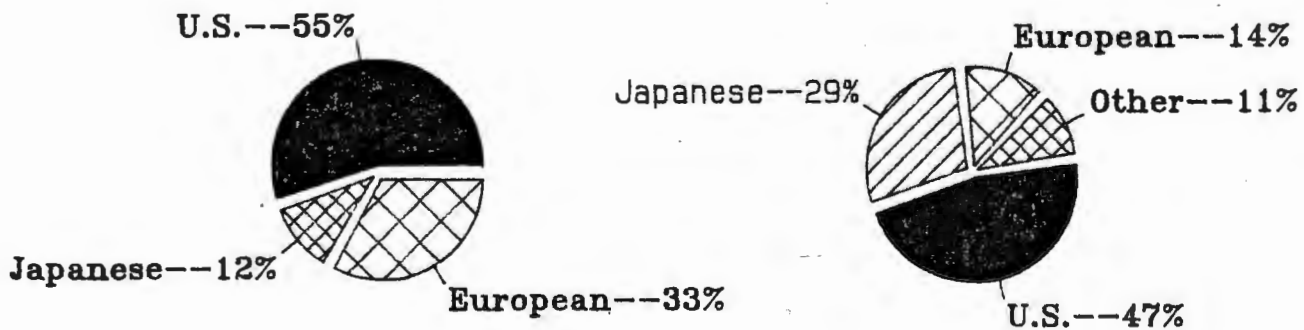
Figure 3

Semiconductor Market Share 1984



U.S. Market
\$11.6 Billion

Japanese Market
\$8 Billion



European Market
\$4.74 Billion

Other Markets
\$1.7 Billion

A. Market Share Analysis Indicates the Presence of Market Barriers

Compelling evidence of significant market barriers in Japan may be found in the chronically low U.S. market share in Japan, which has never exceeded 11-12 percent for any extended period, results which stand in complete contrast to U.S.-firms' competitive performance relative to the Japanese industry in every other major world market (Figure 3).³⁸ Conversely, Japanese firms hold nearly 90 percent of the Japanese market but have been unable to capture even one-third of any other major world market (Figure 4). Such a gross disparity in market shares over a sustained period virtually compels the conclusion that the market Japanese is not open.

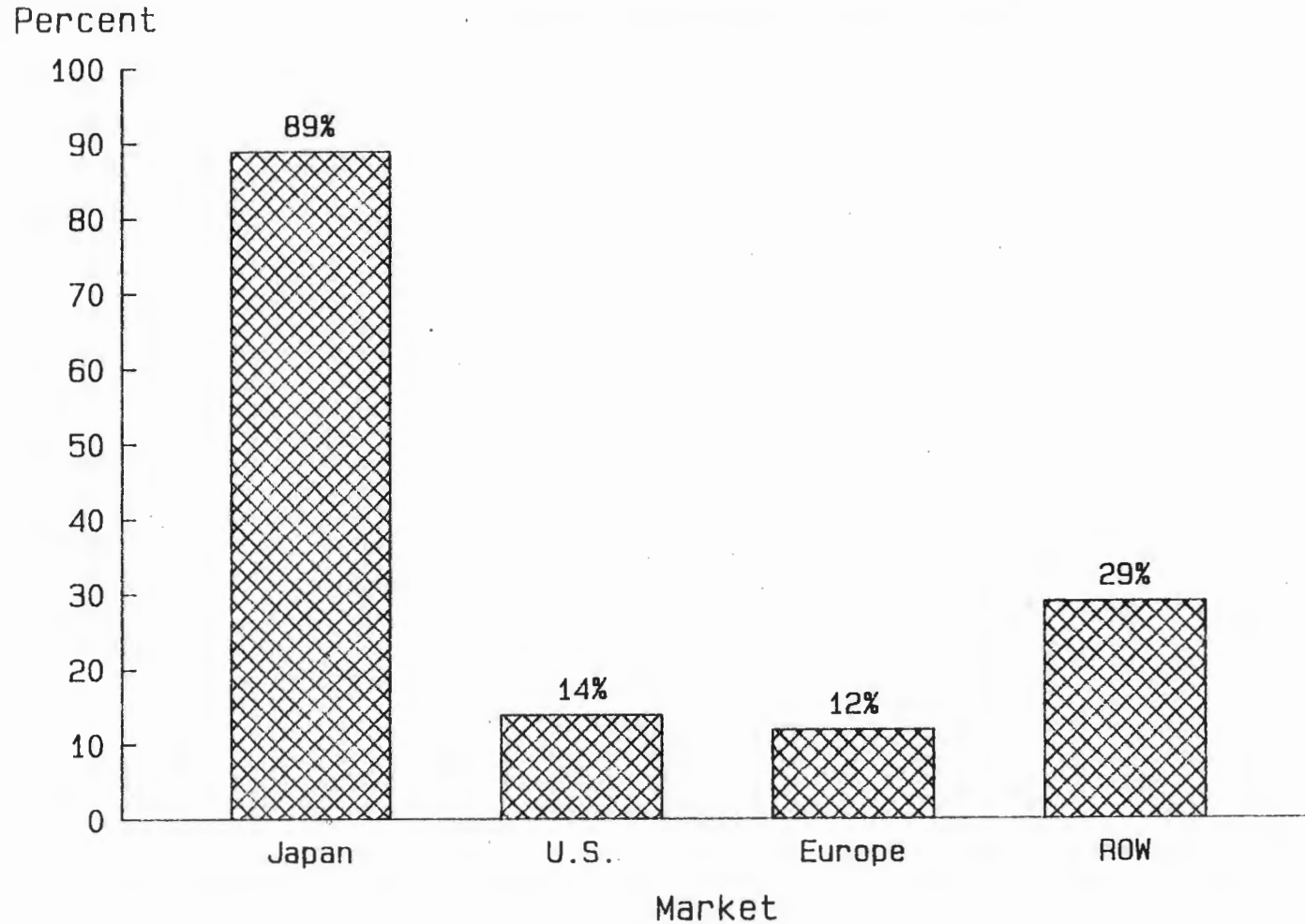
EIAJ's principal response to this evidence has been to advance its own new and unique market share figures. The U.S. Department of Commerce has performed a study of EIAJ's market share figures in this case and concluded that they are "inaccurate and misleading."³⁹ In fact, EIAJ's numbers are not only erroneous but at variance with all accepted measures of market share calculation utilized by reputable data collection organizations and market analysts.

³⁸ See SIA Memorandum, pp. 11-15.

³⁹ Testimony of Counselor to the Secretary for Japan, Clyde Prestowitz, before the Subcommittee on Trade, Productivity and Economic Growth, Joint Economic Committee, October 10, 1985.

Figure 4

Japanese Companies' 1984 Market Share by Market-- Total Semiconductors



Source: Semiconductor Industry Association

EIAJ apparently introduced these new figures into the argument to divert attention from the real problem which the SIA market share data illustrates -- U.S. market penetration in Japan has always been disproportionately low, given American competitiveness, and is now declining, while at the same time, the Japanese share of the U.S. market has increased steadily since 1975.⁴⁰

1. EIAJ Market Share Analysis Varies Radically from Authoritative Estimates and Does Not Show Market Share Trends

EIAJ's market share analysis is not only inaccurate, but consists only of a single-year snapshot, offering no indication of longer term trends. It should be noted that, regardless of the statistics used, the same trends are apparent on a year-over-year basis from all data sources -- U.S. penetration of the Japanese market has not grown, and Japanese companies have been rapidly expanding their share of the U.S. market.

⁴⁰ EIAJ does not directly state the proposition, but attempts to create the inference that SIA's depiction of the U.S. share of Japanese sales excludes local production by Japanese subsidiaries of U.S. firms, such as TI Japan (p. 36). In fact, SIA's calculation of U.S. market share in Japan reflects all sales of U.S.-based companies, wherever located, including not only exports from the U.S. to Japan but sales into Japan from U.S. subsidiaries in East Asia and other third countries, and sales in Japan by Japanese subsidiaries of U.S. companies, such as Nippon Motorola and TI Japan. In 1984, U.S. sales in Japan from all of these sources combined accounted for 11.4 percent of Japanese consumption.

Figure 5

U.S. GOVERNMENT ASSESSMENT OF COMPARATIVE
MARKET SHARES IN SEMICONDUCTORS, 1983

	<u>1973</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
U.S. Share of Japanese Market	8.9%	10.4%	14.5%	11.6%	9.4%	9.7%
Japanese Share of U.S. Market	3.6%	4.7%	6.6%	7.8%	7.3%	10.3%

Source: U.S. Government Semiconductor Study (High Tech Working Group).

The U.S. government reached this conclusion in its 1983 Semiconductor Study (Figure 5), which, incidentally, arrived at market share conclusions virtually identical to those of SIA in this case. The Japanese government's estimates of the U.S. share of the Japanese market for integrated circuits (excluding discrete devices), also submitted to the High Tech Working Group in 1983, showed U.S. firms holding a 12.3 percent share in 1982; nothing has occurred since that date (such as a dramatic increase in sales) to explain how that number might have jumped to 19.1 percent, a market share increase of nearly 50 percent in a 24-month period (Figure 6).⁴¹ More recently the Nomura Research Institute compiled a study of market share and market size using SIA, MITI and Hitachi data which confirms SIA's own market share analysis. Nomura concluded that in 1984, U.S. and European-based suppliers held 10 percent of the Japanese market, while Japanese producers captured 14 percent of the U.S. market, estimates which are virtually identical to those used by SIA in this case, and completely at variance with EIAJ's figures.

2. SIA Data Represents the Accepted Method for Measuring Market Share

Both the U.S. and Japanese government recognized the deficiencies of their statistics during the High Tech

⁴¹ MITI's IC market share figures also show a progressive decline in U.S. participation since 1974, the last year the market was formally protected. MITI Semiconductor Materials for Sectoral Analysis, June 1983, p. GM8808-21.

Figure 6

MITI's 1983 Estimates of U.S. Share of the
Japanese IC Market are at Variance with EIAJ's Current Figure

U.S. SHARE

	<u>MITI</u>	<u>EIAJ</u>
1973	14.3%	
1974	18.2%	
1975	16.6%	
1976	15.9%	
1977	15.3%	
1978	14.0%	
1979	19.9%	
1980	14.0%	
1981	11.7%	
1982	12.3%	
1984		19.1%

Source: MITI Materials for Sectoral Analysis, June 1983,
p. 6M 8808-21.

Working Group (HTWG) negotiations in 1982-83, and agreed to establish a data collection system with a common set of rules. The rules adopted were those of the World Semiconductors Trade Statistics System (WSTS) because they would provide a comparable time series in a rapid and consistent manner.⁴² These agreed rules -- based on the WSTS system -- are the basis for SIA's market share calculations in this case.

Market share is the primary analytical means of determining competitive performance over a period of time. To measure market share and market share trends, the following criteria are essential:

- Products must compete in the market;
- Valuation must be at market and not an intermediate level;
- Measurement must be applied consistently over time.

In semiconductors, only the WSTS system meets these essential criteria, and no rational analytic justification exists for departing from accepted WSTS methodology in this case.⁴³

⁴² Although the HTWG Data Collection System continues to suffer from some implementation irregularities, semiconductor market statistics have been collected for over a decade using the WSTS rules of measurement.

⁴³ Neither U.S. nor Japanese government trade or production statistics comply with the first and second criteria of competition or valuation, nor are either comparable to the other. No other system exists which satisfies these criteria.

Japanese firms, like all other producers, accepted the WSTS system,⁴⁴ a single exception -- that is, when SIA filed its Section 301 Petition, EIAJ apparently decided that use of a different methodology for calculating market share might be expedient, at least for the purposes of this proceeding. Because EIAJ has now challenged the use of WSTS methodology, however -- at least in the context of this case -- it is necessary to examine EIAJ's calculations in detail to see how those calculations were made and why they are not valid.

3. The EIAJ Market Share Data is Deficient

A thorough examination of the EIAJ data leads inevitably to the conclusion that it has no value for analytical purposes in this case. EIAJ data

- Excludes data on discrete semiconductor products;
- Uses different bases for its U.S. and Japanese market calculations;
- Uses unsubstantiated estimates which conflict with hard data available from direct company reporting;
- Contains apparent arithmetic mistakes; and
- Utilizes intermediate value and not market value for import calculations.

A thorough scrutiny of the manner in which EIAJ has manipulated data to produce its market share results requires an

⁴⁴ The WSTS system was adopted by European-based manufacturers in 1980 and by the Japanese industry in 1984.

analysis that is somewhat technical, but which is essential in order to fully appreciate why EIAJ figures should not be used.

a. EIAJ Completely Excluded Discrete Semiconductors from its Analysis

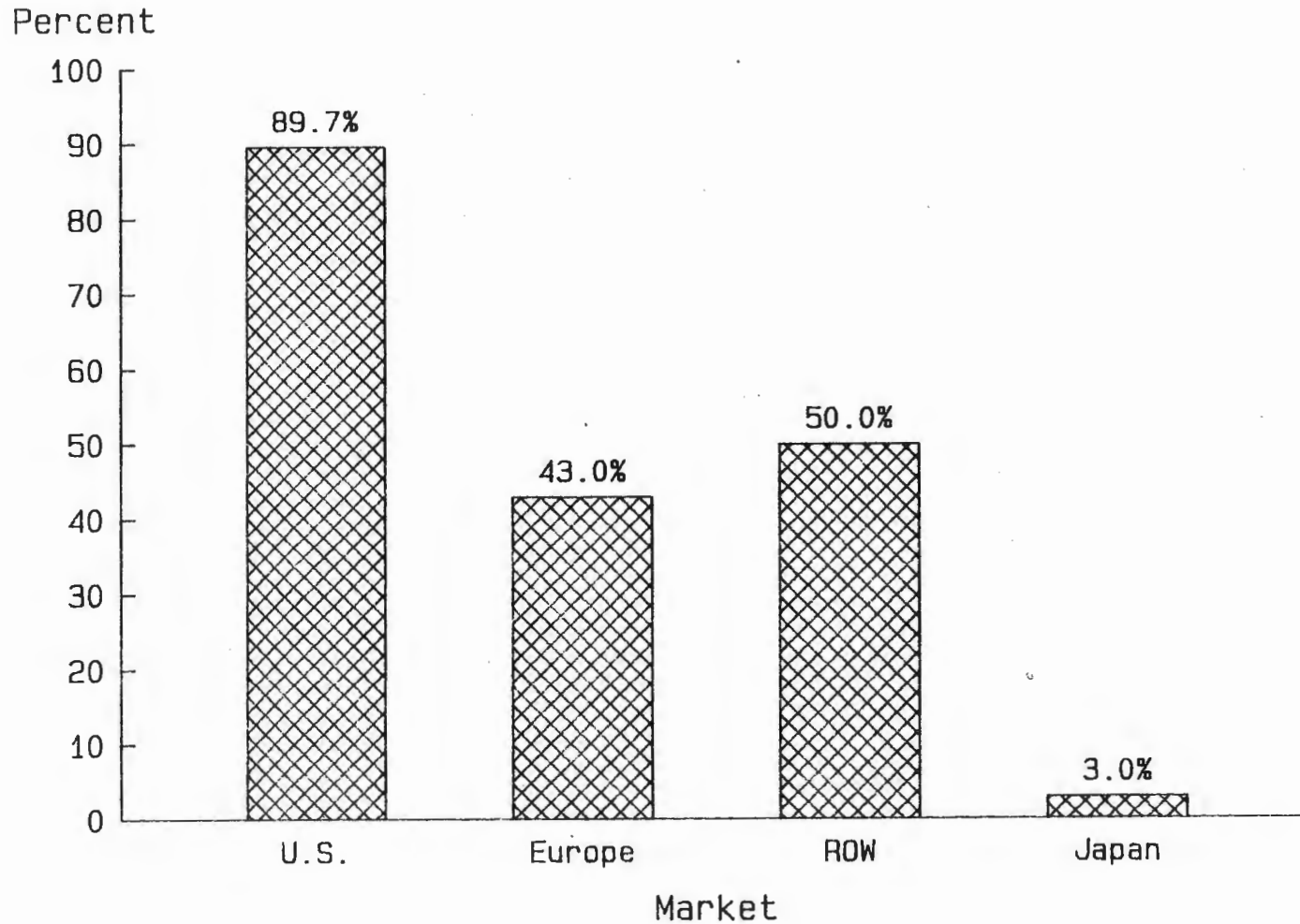
EIAJ market share data embraces only integrated circuits, despite the fact that the Section 301 case under U.S. Government consideration concerns all semiconductor products, including both integrated circuits and discrete semiconductors.⁴⁵ By excluding discretetes from the analysis, EIAJ eliminates the product area where U.S. market penetration in Japan has been lowest, thus by definition artificially inflating the U.S. share of the Japanese market. U.S. manufacturers of discrete semiconductors hold 89.7% of the U.S. discrete semiconductor market, 43% of the European market, 50% of the market in the Rest of the World, but only 3% of the market in Japan (Figure 7).

No analytical justification exists for excluding discretetes, which in 1984 accounted for 16.7 percent of U.S. semiconductor consumption and 22.7 percent of Japanese consumption. These devices are advanced-technology products like ICs, can be produced in the same factories as ICs, and for that matter, are a product area of substantial interest to Japanese semiconductor producers. Their exclusion from

⁴⁵ See SIA Petition filed June 14, 1985, pp. 6-7.

Figure 7

1984 U.S. Market Share in Discrete Semiconductors



Source: Semiconductor Industry Association

EIAJ's analysis appears simply to reflect an attempt to manipulate the market share figures to produce a result more agreeable to EIAJ.

b. EIAJ Uses Faulty Data and Flawed Methodology in Calculating Market Share

An industry's share of a given market is calculated by dividing that industry's total sales (the numerator) by the size of the total market (the denominator). EIAJ's calculation of market share thus employs a formula dividing foreign sales (U.S. firms' sales in Japan and Japanese firms' sales in the U.S.) by the size of the total market:

$$\frac{(a) + (b) + (c)}{(d)} = \text{market share}$$

Where

- (a) = Direct imports from the U.S./Japan
- (b) = Products manufactured in the U.S./Japan by U.S./Japanese subsidiaries and shipped to the U.S./Japanese market.
- (c) = Imports from off-shore production.
- (d) = Total market demand, including captive consumption.

This method is perfectly acceptable; however, results can be skewed through manipulating the numbers used as inputs.⁴⁶ Use of a smaller denominator, and/or a larger numerator tend to produce a depiction of a larger foreign market share; a larger denominator and/or a smaller numerator produce the

⁴⁶ Moreover, accurate data at market prices is not available for all variables and use of intermediate transfer values can skew the results.

Figure 8

COMPARISON OF EIAJ AND SIA MARKET SHARE CALCULATIONS

Integrated Circuits	<u>Japanese Market</u>		<u>U.S Market</u>	
	<u>EIAJ Data</u>	<u>SIA from WSTS</u>	<u>EIAJ Data</u>	<u>SIA from WSTS</u>
<u>Dollars in Millions</u>				
U.S. Sources Merchant				
from U.S.	332 ¹	0	5114	0 ¹
from Japan	283 ¹	0	+5	0 ¹
from Offshore	<u>128¹</u>	<u>0</u>	<u>1355</u>	<u>0³</u>
TOTAL U.S.	743	850*	9484	7910*
European Sources Merchant	23	26	47	226
Japanese Sources Merchant				
from U.S.	--	--	232	--
from Japan	3643	4643	1255	--
from Offshore	<u>80</u>	<u>80</u>	<u>--</u>	<u>--</u>
TOTAL JAPAN	3723	4723	1487	1520
TOTAL MERCHANT	<u>4489</u>	<u>5599*</u>	<u>11019</u>	<u>9656*</u>
Captive				
U.S. Source ²	283	--	4478	--
Japanese source ¹	<u>578</u>	<u>578</u>	<u>--</u>	<u>--</u>
TOTAL CAPTIVE	1861	578	4478	
TOTAL MARKET	5350	6177*	15497	9656*

*Data from published WSTS source.

¹Included in total (includes merchant in-house transfer).

²Pure captive IBM, ATT nonstandard devices.

³Merchant in-house transfer reported to WSTS.

opposite result. EIAJ has in fact employed this technique to inflate the U.S. share of the Japanese market and to deflate the Japanese share of the U.S. market. The differences between EIAJ and SIA market share inputs are summarized in Figure 8).

i. U.S. Share of the Japanese Market

For the U.S.-based companies' share of the Japanese market, EIAJ utilizes an inflated numerator (U.S.-based companies' sales in Japan) of \$1,023 million, and a deflated denominator (the size of the Japanese IC market) of \$5,350 million to arrive at an overstated U.S. market share in the Japanese IC market of 19.1%. To calculate U.S. companies' IC sales in Japan, EIAJ adds (a) direct imports from the U.S., (b) products manufactured in Japan by U.S.-based companies, and (c) imports from U.S.-based companies' offshore production. This methodology would yield the appropriate level of U.S. sales in Japan if accurate data were used to perform the computations.

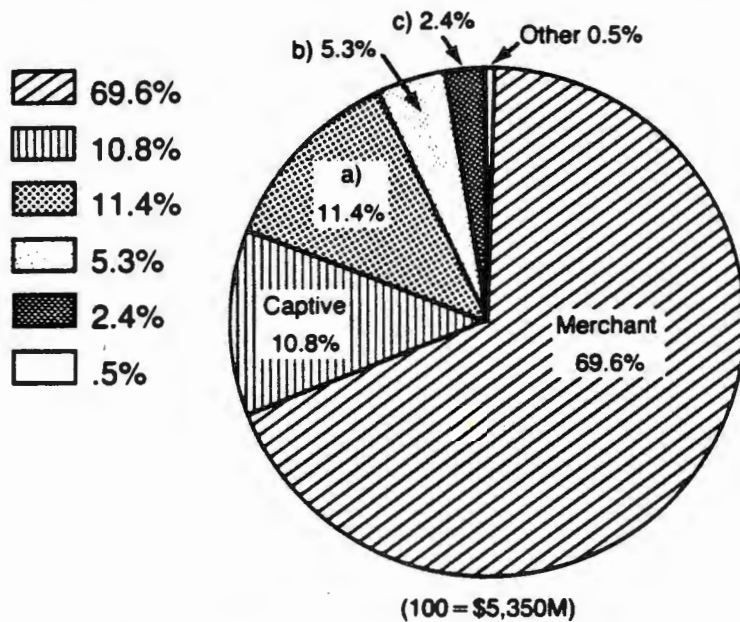
However, EIAJ's estimates in each of the elements of the equation (which appear to be based on MITI estimates) differ significantly from all other sources of this information.⁴⁷ EIAJ states, for instance, that direct Japanese

⁴⁷ EIAJ does not explain in its brief how the \$1,023 million is broken down by subcategory. However, SIA obtained EIAJ's breakdown of inputs from pie charts handed out by EIAJ at a press conference (Figure 9). EIAJ does not reveal the source of these figures, but a MITI submission to the U.S. Government utilized the same totals for both numerator and denominator of the equation and provided the data on which
(Footnote continued)

Figure 9

CHART HANDED OUT BY EIAJ AT PRESS CONFERENCE SHOWS THE
BREAKOUT OF ITS MARKET SHARE CALCULATIONS

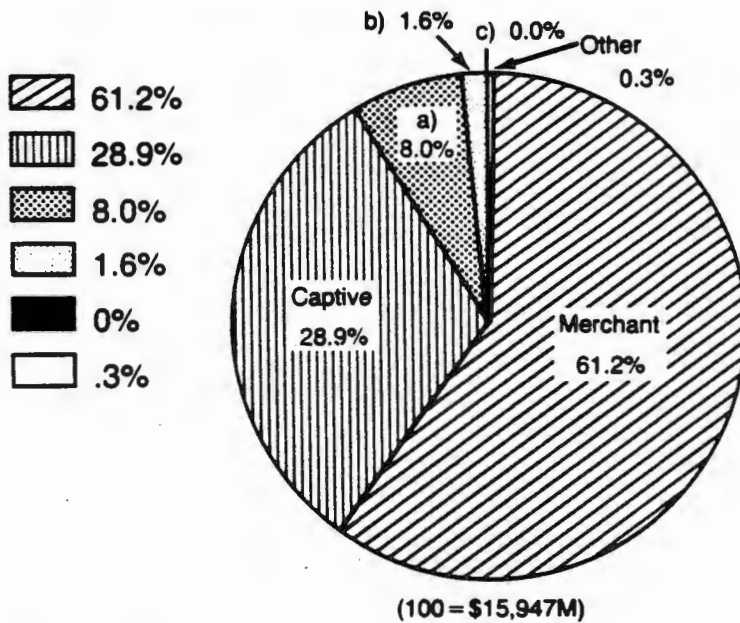
THE U.S.-BASED MAKERS' SHARE IN JAPANESE IC MARKET IN 1984



The U.S.-based Makers' Share	
a) Direct Imports from U.S.	11.4% (\$612M)
b) Products Manufactured in Japan by U.S.	5.3% (\$285M)
c) Imports from U.S. Off-Shore Production	2.4% (\$126M)
Total	19.1% (\$1,023M)

Source: Total Demands and (a)—Ministry of Int'l Trade and Industry Ministry of Finance
(b) and (c)—EIAJ Estimates

THE JAPANESE-BASED MAKERS' SHARE IN U.S. IC MARKET IN 1984



The Japanese-based Makers' Share	
a) Direct Exports from Japan	8.0% (\$1,279M)
b) Products Manufactured in U.S. by Japanese	1.6% (\$ 246M)
c) Exports of Japanese Off-Shore Production to U.S.	0.0% (\$ 6M)
Total	9.6% (\$1,531M)

Source: Total Demands—Dataquest, Inc.
(a), (b) and (c)—Ministry of Int'l Trade and Industry

integrated circuit imports from the United States in 1984 were \$687 million, a figure that is more than 2 1/2 times too high -- a principal reason for the U.S. Commerce Department's conclusion that EIAJ's figures are "inaccurate and misleading." ⁴⁸ Official U.S. Department of Commerce data indicates that total 1984 U.S. direct exports to Japan of all semiconductors -- integrated circuits and discrettes -- were only \$251 million, or \$436 million less than the figure used by EIAJ. This error is not offset by EIAJ's inaccurate estimate of U.S. sales into Japan from offshore and Japanese subsidiaries, which is too low.⁴⁹ The total EIAJ estimate of U.S. firms' sales in Japan is \$173 million (or 17%) greater than the amount shown by the data collected by the WSTS program directly from U.S., Japanese and European companies.⁵⁰

(Footnote 47 continued from previous page)
these figures were based. The source of MITI's data is not revealed.

⁴⁸ This figure represents \$332 million in U.S. merchant shipments and \$283 million in U.S. captive shipments. The following section discusses why captive consumption is not properly includable.

⁴⁹ EIAJ's estimates of 1984 sales to Japan from U.S. companies' offshore assembly locations (\$126 million) appear to be too low since the majority of U.S. integrated circuit sales to Japan are assembled in offshore locations. EIAJ estimates that sales in Japan of products manufactured in Japan by U.S. companies are \$210 million -- a figure which, according to SIA's estimates, is also somewhat low.

⁵⁰ It is also \$106 million greater than Dataquest's estimate of U.S.-based companies' sales in Japan, and \$237 million greater than the HTWG Data Collection System estimate.

For the denominator of the equation -- that is, total Japanese consumption -- EIAJ uses a figure of \$5,350 million, a figure which is clearly incorrect and much too low.⁵¹ EIAJ claims that this figure represents all Japanese integrated circuit consumption in 1984.⁵² Direct submissions to the WSTS program by U.S., Japanese and European companies, however, indicate a total level of 1984 IC consumption in Japan of \$6,180 million -- a figure 15.5% higher than the EIAJ estimate. Dataquest has independently reached a virtually identical estimate of total 1984 Japanese integrated circuit consumption \$6,154 million. A 1985 MITI estimate concluded the market was only slightly smaller, about \$5,960 million (Figure 10).

Table A compares EIAJ and SIA (WSTS and HTWG) data with respect to the size of the Japanese market:

⁵¹ The EIAJ Brief does not list a source of this figure, but it is identical to a figure earlier provided by MITI to the U.S. Government.

⁵² If the Japanese producers really believe this estimate of the size of the Japanese market, then their 1985 capital investment level -- 606 billion yen -- represents an extraordinary 42 percent of their total sales, and envisions a phenomenal projected growth rate of 48 percent per year (since each new investment dollar leads to about \$1.10 in sales volume.) Such a level of investment is inherently incredible and suggests that EIAJ probably does not believe its own numbers with respect to the size of the Japanese market.

Figure 10

In a 1985 speech, a MITI official gave the 1984 size of the Japanese IC market as ¥ 1.4193 trillion, or \$5.96 billion at 238:1

(2) Recent trends in the Japanese electronics industry

The 1984 production figures were ¥16.431 trillion, a 28.7 percent increase over 1983. Industrial electrical equipment reached ¥5.9912 trillion, a 30.2 percent increase based on growth in computers; electronic components rose some 23.0 percent, and active components including ICs grew 51.4 percent to ¥3,0483 trillion (refer to Appendix 3).

(3) Future estimates for the electronics industry (refer to Appendix 4)

Industry specialists estimate yearly growth rates over the medium term at 12.4 percent for the Japanese industrial electronic equipment industry and 15.4 percent for the consumer electronics industry.

(4) Trends in the IC industry (refer to Appendix 5)

→ The 1984 Japanese IC market was ¥1.4193 trillion, a 63 percent growth over the previous year. A 20 percent yearly growth rate is predicted for the medium term (refer to Appendix 4).

Source: Hiroshi Shima, Director of Industrial Electronics, Ministry of International Trade and Industry, at Japanese Semiconductor Industry Conference, Hakone, Japan, April 14-16, 1985.

Table A

	<u>EIAJ</u>	<u>SIA</u>	<u>Difference</u>
	(\$ Millions)		
<u>Japanese market</u>			
Japanese merchant	4301	5301	1000
Japanese captive	283	-	-

The net \$1.000 billion difference in the Japanese merchant market strongly suggests that an arithmetic error occurred in the compilation of the EIAJ response, and may account for EIAJ's unusually low estimate of Japanese consumption. The WSTS data from Japan consists of 12 monthly reports including 188 specific product and market inputs. Each of these were monitored monthly for accuracy and consistency by the Long Term Credit Bank Institute in Tokyo, Japan, the representative body selected by EIAJ to receive inputs on a monthly basis from the 15 Japanese firms reporting to WSTS. It is extraordinarily unlikely that an exact \$1.0 billion error could have occurred in this data, compiled from over 30,000 inputs.

EIAJ's 10%-17% overstatement of U.S. sales in Japan, coupled with its 15% underestimate of the size of the Japanese semiconductor market (and its complete exclusion of discretely from the analysis) lead to a greatly exaggerated estimate of U.S. market share in Japan. Either the EIAJ is incapable of performing such straightforward calculations, or these distortions were carried out deliberately in an effort to divert attention from the basic problem -- the

fact that U.S. firms' market share in Japan is unaccountably low, given their demonstrated competitiveness.

Treatment of Internal Consumption

Substantial confusion has arisen over the years with respect to the treatment of "captive" consumption of semiconductors in calculating market shares. "Captive" consumption popularly refers to internal consumption of semiconductors, but refers to two types of internal transfers. Technically "captive" consumption is internal consumption of nonstandard devices which can be used only within the company and for which no outside market exists. This should be distinguished from "in-house transfers" which refers to the internal consumption of standard semiconductors which other companies also use and for which, therefore, a market exists outside the company itself.

SIA has always operated its statistical program on the concept of Total Available Market (TAM). Under TAM, the product which is relevant to a market analysis is that which can potentially be traded -- that is, a product which is fungible with devices made by other producers. Under this methodology, standard commercial products are included in the WSTS system, whether consumed in-house or sold on the merchant market, whether the producer is Fujitsu, Motorola, NEC or TI. AT&T standard products will be counted as AT&T begins to standardize its production to utilize commercial packaging.

On the other hand, nonstandard (captive) products are not counted because there is no market for them; the product cannot be assigned a clear value, nor does a clear reason exist even to collect the data. The test of whether a product is properly includable in the total available market is that of the burned-down factory: if the producer could buy a substitute product on the market if it lost its internal source of supply due to a fire, then the internal production should be counted as part of the market.

Thus, under the WSTS system, both Japanese and U.S. firms' in-house transfers of standard products are counted for purposes of market analysis. Only U.S. firms produce significant volumes of nonstandard products, but if NEC, Toshiba or other Japanese firms began producing non-standard devices, those too should be excluded from compilations of data.⁵³

EIAJ's Brief notes that its \$5,350 million figure for Japanese IC consumption includes "captive" consumption, as if to suggest that EIAJ's inclusion of (a) estimated total U.S. captive shipments to Japan, and (b) U.S. captive consumption in the U.S. in its calculations is reasonable. In fact, this is an unjustified apples-and-oranges comparison. Japanese "captive" consumption consists of in-house

⁵³ IBM does not make standard semiconductors, and has had a policy for 25 years of not selling any semiconductors on the merchant market.

transfers of standard products, which SIA would not classify as captive. U.S. captive shipments are nonstandard products which should be excluded from any market share analysis of trade in the semiconductor industry. EIAJ itself embraced this view in 1979, explaining to the U.S. International Trade Commission that

In addition to the traditional merchant semiconductor manufacturers, a number of U.S. semiconductor firms produce semiconductor circuits to be incorporated in their own end products, both consumer and industrial. The captive supplier environment is typically characterized by an emphasis on circuit development, by relatively low production volumes, and by a relatively large variation in month-to-month production rates. These differences lead to software and equipment demands that differ from those of merchant supplier. Since the output of the captive producer is consumed within the firm, these U.S. manufacturers are not affected by conventional market forces, including imports from offshore facilities.⁵⁴

ii. The Japanese Share of the U.S. Market

In calculating Japanese companies' share of the U.S. market, the EIAJ Brief uses HTWG data for the numerator of the equation -- that is, Japanese sales in the U.S. market -- including direct imports, Japanese subsidiaries' shipments to the U.S. market from U.S. facilities, and Japanese offshore shipments to the U.S. market. This figure is

⁵⁴ Statement of Ivars Gutmanis on behalf of the EIAJ, May 29, 1979, U.S.I.T.C. Inv. No. 332-102, pp. 45-46.

\$1,519 million, with which SIA concurs. However, for the denominator -- representing the size of the U.S. market -- EIAJ again departs from known data and relies on two constructed numbers, neither of which is reliable and one of which is inconsistent with EIAJ's methodology for calculating the size of the Japanese market.

EIAJ relies on an unverifiable estimate of U.S. merchant IC sales in 1984 of \$11,332 million. This number -- which constitutes an overstatement of these sales by about \$1.7 billion (or 17.6%), according to WSTS survey statistics, apparently comes from IC Engineering. It is extraordinarily unlikely that the WSTS survey, which covers 95%-98% of world shipments by direct reporting, would have made a \$2 billion error.

The huge differences between the U.S. merchant market as reported to WSTS by the U.S. and Japanese industries and the EIAJ estimate cannot be easily dismissed. The U.S. merchant market has been accurately defined since 1975 through WSTS and its predecessor statistical program, STSP. There have been no year-to-year discontinuities and the leading sources (such as Dataquest) have closely tracked the annual STSP and WSTS definition of the U.S. market. The difference can only be attributed to an EIAJ error of in-

cluding 806.3 and 807 shipments⁵⁵ as a part of end market shipments.

In addition, EIAJ adds an estimated number for nonstandard captive production to this inflated and erroneous number. It is impossible to determine whether the \$4.6 billion attributed to non-market, nonstandard captive production is accurate; the number is based completely on conjecture. More importantly, however, it is not relevant, because it does not and cannot represent part of the U.S. Total Available Market -- they are not fungible with, or even potentially competitive with, merchant semiconductors.

⁵⁵ 806.3 and 807 shipments represent imports of semiconductors produced in the U.S., assembled overseas, and returned to the U.S. for final testing and shipment.

B. Market Structure Analysis Indicates the Presence of Market Barriers

The gross disparity between U.S. semiconductor producers' market share in Japan and all other world markets is compelling evidence that market barriers exist in Japan. Moreover, the statistical evidence of comparative market shares is significantly reinforced by the evidence SIA presented along with its Petition concerning the actual structure of the Japanese semiconductor market and the history of the evolution of that structure.

In its response on the issue of market structure, EIAJ expends most of its argument stressing the theme that "SIA has produced no proof,"⁵⁶ "SIA presents no evidence,"⁵⁷ "SIA offers no evidence"⁵⁸ on competition issues. EIAJ in fact does not address the substantial body of evidence which SIA has presented, and EIAJ's discussion of the various collusive activities which SIA has identified is curiously opaque.⁵⁹

SIA's evidence shows that the Japanese market has certain characteristics which, taken together, strongly point to a pattern of collusive interfirm behavior by Japa-

⁵⁶ EIAJ Brief, p. 49.

⁵⁷ EIAJ Brief, p. 53.

⁵⁸ EIAJ Brief, p. 51.

⁵⁹ Documentary evidence on the evolution of the Japanese market structure has been submitted by SIA in Japanese Protection and Promotion of the Semiconductor Industry (1985).

nese firms to exclude outsiders. SIA's analysis is not particularly radical -- similar views of the Japanese semiconductor market have been expressed by the Office of the U.S. Trade Representative and the Commerce Department⁶⁰; by the U.S. Office of Technology Assessment⁶¹; by the OECD⁶²; by the U.S. International Trade Commission⁶³; by the Japanese companies themselves⁶⁴; and even by EIAJ's counsel, Mr. Tanaka, in testimony before the U.S. International Trade Commission in 1979.⁶⁵

SIA has shown that in the Japanese semiconductor industry, Japanese firms dominate end-use markets; the dominant consumers are also the dominant producers; that there is an extremely high volume of interfirm trade; that the dominant producers-consumers are linked through a large number of horizontal ties; and that this structure not only functions to exclude outsiders today, but was originally established with precisely that intention.⁶⁶

⁶⁰ U.S. Government Semiconductor Study (1983) Part V.

⁶¹ OTA, International Competitiveness in Electronics (1983) p. 199.

⁶² OECD, The Semiconductor Industry: Trade Related Issues (1985).

⁶³ U.S.I.T.C., Competitive Factors Influencing World Trade in Integrated Circuits (1979) p. 62.

⁶⁴ Scientific American, October 1982.

⁶⁵ USITC Investigation No. 332-102, May 31, 1979, Transcript of Hearing at 294-95. His comments are reproduced in the SIA Memorandum, p. 29.

⁶⁶ SIA Memorandum, pp. 17-62.

EIAJ addresses each element of this system separately -- horizontal ties, vertical relationships, and so on -- and concludes that each factor, taken by itself, is not proof of anticompetitive activity and would not violate the U.S. antitrust laws.⁶⁷ Competition analysis, however, does not examine the various component parts of a combination separately, but views them in their entirety, together with the intent of the participants.⁶⁸ In the present case, an

⁶⁷ Much of this point-by-point comment is devoted to setting up and knocking down straw men. EIAJ states, for example (p. 54) that SIA is critical of vertical integration; in fact, SIA nowhere criticizes vertical integration -- the problem in Japan is not vertical integration, but the fact that semiconductor consumption is dominated by the main semiconductor producers, who sell principally to each other to the exclusion of outsiders. Similarly, SIA notes that within such a structure, low component prices can reflect either price competition or reciprocal dealing arrangements, since low device prices can mutually benefit end-users; in a shrill rejoinder, EIAJ chooses to misread this as a statement to the effect that "price competition is evidence of anticompetitive behavior." EIAJ Brief, p. 48. Similarly, EIAJ makes a false analogy (p. 47) when it argues that the fact that Japanese semiconductor consumers possess the means to restrict foreign purchases is meaningless because "this is true of any concentrated industry in the U.S., such as auto, telephone apparatus, flat glass, cigarettes, electric lamps, cereal preparations, etc." It is not true that these concentrated U.S. industries dominate both production and consumption of the product in question, which is the case in the Japanese semiconductor industry.

⁶⁸ Under U.S. antitrust law, in determining the existence of an illegal anticompetitive combination, the combination is "not to be viewed from a consideration of its component parts which may be unobjectionable in themselves and taken separately, but from an examination of the whole of the elements or a "panorama" of all the acts and circumstances." The key factor in determining illegality is the intent of the participants in the combination. U.S. v. L.D. Caulk Company, 126 F. Supp. 693, 698 (D.C. Del. 1954); American Tobacco Co. v. U.S., 328 U.S. 781 (1946).

extraordinary number of mutually-reinforcing factors point to the presence of anticompetitive activity.

EIAJ addresses a number of individual structural factors cited by SIA -- albeit separately -- but ignores the most crucial factor of all, the intent by Japanese producer-consumers to exclude outsiders, which has been repeatedly demonstrated and openly stated by Japanese firms for years.⁶⁹ Such intent, coupled with the manner in which the market is currently structured, has led a number of sources, including the Office of the U.S. Trade Representative and the Department of Commerce to infer that the Japanese firms are engaging in "formal or informal market sharing arrangements not open to foreigners."⁷⁰ The net result of this system is that foreign firms are relegated to the role of

⁶⁹ In 1985, for example, Japanese semiconductor "Company J" sent a memorandum to a U.S. semiconductor company proposing that Company J acquire know-how from the U.S. company and assemble and market the U.S. company's "Type X" chips in Japan. Company J stated to the U.S. company that "In the Japanese market, customers are always negative to the purchase of foreign products. This traditional practice will not be changed very soon. Alternatively the local production of [Type X] chips by [Company J] is believed to be well accepted by the domestic market." In other words, the same product will sell far more successfully in Japan if the vendor is perceived to be Japanese (emphasis added) (This memorandum is on file at Dewey, Ballantine, Bushby, Palmer and Wood).

⁷⁰ U.S. Government Semiconductor Study (1983), Part V. This is the real significance of the 1971-72 attempt to form an integrated circuit cartel -- the point is not, as EIAJ states (p. 50), whether or not a formal cartel was ever formed, but that the Japanese producers were consciously attempting, and would continue to attempt, to respond to foreign competition by organizing a division of product markets.

residual suppliers -- able to sell only so long as a competing Japanese device is not available. This is not solely a problem for U.S. firms; the Far Eastern Economic Review reported on August 22, 1985 that

Siemens is more outspoken about the difficulties of the Japanese market. According to Gernot Oswald, an executive director in the components division, "Japan is just not buying from outside if firms have their own supplier. So what you can do there is mainly to fill a temporary gap with a product which is not readily available there. As soon as the product is available from local Japanese sources, your chances go down to very close to zero." This active discrimination against foreign products does not apply, says Oswald, in other parts of Asia. "Our relative market share is much, much higher than in Japan. But unfortunately Japan is a much bigger market. . . . Our ambitions for the Far East are high compared to what we have, but realistically low with respect to expectations that Japan will be a completely open market very soon."

EIAJ states that by citing such barriers, SIA is asking the President to "pass judgement on the entire structure of a national market" (p. 39). In fact, SIA is asking the U.S. government to pass judgement on the acts, policies and practices of a government that created the structure as a mechanism for denying the United States the benefit of trade concessions under bilateral and multilateral agreements, and which continues to condone and support such a

structure today.⁷¹ Japanese government measures, including the liberalization countermeasures, were designed to create a domestic industry structure which, through the establishment of horizontal and vertical interfirm ties, would enable the Japanese industry to withstand U.S. import penetration.⁷² EIAJ does not mention the liberalization countermeasures -- what they were, and more importantly, what they were intended to accomplish -- anywhere in its Brief, which makes much of SIA's "lack of evidence".

EIAJ deals only obliquely with the whole subject of past Japanese practices, and a number of its assertions

⁷¹ The Office of the U.S. Trade Representative stated in a recent submission to the OECD that "Japan's informal measures to restrict imports are less apparent, but are sometimes more restrictive than formal barriers. A frequent complaint of foreign suppliers is that opportunities for trade are limited by the operation of informal industry groups. In many areas of commerce, the Japanese Government has acceded direct regulatory responsibility to industry groupings or associations that then collude to limit foreign participation in the market." That is precisely what has occurred in this industry. USTR, U.S. Statement on Japanese Market Access, pp. 17-18.

⁷² MITI continued to encourage the Japanese semiconductor producers to strengthen their links with end-users after liberalization. MITI's 1979 plan for the elevation of the integrated circuit industry recommended, among other things, that the industry

[Attend] to needs in each demand field through the establishment of a cooperative regime with users.

MITI Machine and Information Bureau, Trade and Industry Research Group, Commentary on to Law for Provisional Measures for the Promotion of Designated Machine and Information Industries (1979)

are directly controverted by other Japanese sources. EIAJ states, for example, (p. 44) that MITI did not "prohibit other manufacturers from entering the IC market." The Japan Economic Journal reported on November 19, 1968, however, that MITI had "decided on a policy of holding down entry of new makers into the field of integrated circuits. . . ." EIAJ states (p. 44) that "MITI's programs were neither intended to divide markets nor did they have that effect. . . . MITI did not direct companies to limit their production to those areas [of allocated research tasks; emphasis in the original.] However, Nihon Keizai reported on June 15, 1973 that

By targeting 6 [IC] manufacturers out of 12 manufacturers which have strong sales systems, MITI will guide them to adjust their production areas for establishing the division of labor...MITI intends to issue aid for liberalization countermeasures (emphasis added.)

EIAJ's brief confuses the market structure issue in other respects. SIA pointed out that a few large producer-consumers dominate the market; EIAJ's rejoinder (pp. 44-45) is that new entrants have come into the industry which "has grown to 18 producers." This may be true, but it is also beside the point, since six of these 18 firms control 85 percent of the market. As the U.S. Government stated in its 1983 Semiconductor Study, in Japan

Only about 18 firms engage in semiconductor production; of these, six

(NEC, Hitachi, Toshiba, Fujitsu, Mitsubishi and Matsushita) account for 85 percent of total Japanese production.... Japanese semiconductor producers tend to specialize in particular product lines ("intra-industry specialization") and engage in a significant amount of trade among themselves.

EIAJ's response (pp. 44-46) on the subject of the relatively high degree of device specialization in the Japanese industry is a table (Table 6, Appendix I) which creates the impression that all Japanese producers make virtually every semiconductor product. This is misleading because the fifteen product categories are so broad ("industrial linear," "other MOS logic") as to be meaningless. In an industry characterized by thousands of extraordinarily complex product types, in which closely-related products are differentiated with respect to factors such as speed, nibble, operating mode, number of pins, power requirements, and many other elements, no conclusion with respect to the degree of device specialization can be drawn one way or the other from this simplistic chart.⁷³ Suffice it to say that numerous

⁷³ EIAJ overstates SIA's point on this subject, charging that SIA cites "an alleged MITI policy to assign specific IC products to individual companies and to prevent others from competing in those product areas[SIA alleges] that the Japanese manufacturers have agreed to divide product markets and to eliminate competition among themselves." For the record, SIA noted the phenomenon of device specialization (which has been cited by numerous authorities) and stated that "There is nothing inherently objectionable about product specialization.... However, when a substantial product specialization exists between a group of producer--consumers who also produce primarily from each other, such specialization may be one element of a broader pattern of reciprocal inter firm dealings which have anticompetitive effects." SIA Memorandum, p. 23

authorities that have studied the Japanese semiconductor industry have concluded that it is characterized by a comparatively high degree of device specialization, coupled with a high level of interfirm trade.⁷⁴ Japanese sources occasionally cite this phenomenon themselves; ⁷⁵ the 1985 Japan Electronics Almanac commented (p. 248) with respect to Japanese production of thick-film hybrid ICs that

Each manufacturer does not produce all types of these ICs, but specializes in a particular field.

By raising the market structure issue, SIA is not presenting the U.S. government with an outlandish demand, or raising a matter which is only of historical significance, but requesting that it confront the fact that the Japanese Government has effectively denied the U.S. the benefits of bargained-for trade concessions through the mechanism of manipulation of the domestic industry market structure.

⁷⁴ U.S. Government Semiconductor Study (1983); OECD, The Semiconductor Industry: Trade Related Issues (1985), p. 31; Bank of America, The Japanese Semiconductor Industry 1980 (1980) p. 133; D. Okimoto, Competitive Edge (1984) pp. 218-219; Borrus, Millstein and Zysman, "Trade and Development in the Semiconductor Industry: Japanese Challenge and American Response," in Zysman and Tyson, eds., American Industry in International Competition (1984) p. 192.

⁷⁵ The Japanese Semiconductor Manual for 1984 (Puresu Janaru, March 20, 1984) states that "Toshiba ranks among the big three in semiconductor production in Japan. However, its production volume, totaling 20 billion yen, lags behind NEC and Hitachi. This is due to differences in market sectors in which these companies specialized.... [Toshiba is not] spreading itself thin; rather, the company seems to concentrate on those product lines where it has particular strength."

MITI is still using this technique -- establishment and promotion of "deep" ties between producers and consumers, as well as horizontal industry linkages -- as a policy mechanism for defending the Japanese market against U.S. import penetration. A 1985 study prepared by MITI and a group of Japanese producers of high purity silicon, for example -- a sector which MITI currently fears is jeopardized by imports -- concluded that:

It is expected that the establishment of production facilities in Japan by foreign makers will enable them to make a full-scale inroad into the Japanese market, which they could not do before, and that this will increase the level of competition.... Further advancements in integration level, which requires finer fabrication techniques, should further encourage establishment of closer relationships between silicon makers and users. It should be emphasized, however, that, in addition to such interactions between supplier and user, a mechanism for industrywide interaction by the silicon makers and the device makers must be established so that standards can be established, specifications can be made uniform, and user needs can be made more clearly understood...[the industry must] strengthen the corporate ground to meet the entry of foreign manufacturers into the Japanese market.⁷⁶

⁷⁶ This "Chosa Hokokusho" (Research Report) was prepared by the "High Purity Silicon Issues Study Group" in March 1985 by a group of Japanese high purity silicon producers, chaired by MITI's Terue Kataoka, Manager, Electronic Devices Department, Electrotechnical Laboratory. Forbes commented on August 25, 1985 with respect to MITI's high purity silicon project that "It is very clear that for all their protestations about wanting to open their markets, the Japanese continue to pursue national goals that conflict with the idea of free trade.. [MITI's concern is that] Japanese semiconductor producers might be forced to rely on foreign
(Footnote continued)

U.S. government inaction in the face of such tactics will, in effect, demonstrate to Japan the existence of an effective and useful mechanism by which its commitments to its trading partners can be sidestepped.

Finally, EIAJ repeatedly stresses (pp. 46-50) the purported paradox of SIA's citation of manifestations of intense competition in a market where anticompetitive activity is said to be present -- "in other words, the Japanese producers are "guilty" of being too competitive in their own market!"(p. 50) Such statements presuppose that the reader knows little or nothing of the nature of Japanese industrial organization and behavior. In Japan, many of the industrial sectors where interfirm rivalry and price competition have been most ferocious -- e.g. steel -- have also been the most prone to the formation of cartels, and, for that matter, collective action to restrict imports.⁷⁷ Anticompetitive arrangements are in fact often a response to recurrent mani-

(Footnote 76 continued from previous page)
suppliers. Thus the determination to achieve dominance of the market, regardless of the cost."

⁷⁷ It should be noted that the formation of a cartel or other similar arrangement does not end competition; it merely changes the manner in which competition is waged. In cartels market shares are negotiated -- sometimes heatedly -- rather than determined through the operation of market forces. For a description of recent anticompetitive activity in the steel industry, where interfirm rivalries are also intense, see Nihon Keizai, January 7, 1981. Japanese steelmakers have held imports to negligible levels by exercising "pressure" on the trading companies which distribute steel to steel end users. Far Eastern Economic Review, October 11, 1984. Japan Economic Journal, December 6, 1981.

festations of "excessive competition" and overcapacity in a sector, or to a problem, such as raw materials shortages or competition from foreign imports, where the domestic producers -- however bitter their rivalry -- mutually benefit from joint action.

C. EIAJ's Explanations for the Low U.S. Share of the Japanese Market are Inadequate

EIAJ contends that the Japanese market is open and that U.S. firms enjoy a large share of that market -- arguing, in effect, that no problem exists -- but it also offers a number of explanations as to why U.S. firms do not enjoy a larger share of Japanese semiconductor consumption. These explanations are of two basic types: 1) U.S. firms' own competitive shortcomings have led to their low share of Japanese sales; and 2) the composition of Japanese semiconductor consumption differs significantly from that of other world markets where U.S. producers outsell their Japanese counterparts. EIAJ's evidence on these points is misleading and is wholly inadequate to explain U.S. firms' low market share in Japan.

1. U.S. Firms' Competitive Performance Does Not Explain Their Low Share of Japanese Sales

EIAJ attempts to explain the U.S. semiconductor industry's low share of the Japanese market by noting that comparatively few U.S. firms have local production facilities in Japan (Japan prevented this by law for many years) and stating that the performance of some U.S. merchant firms

with respect to price, quality, delivery time, and customer service, including the handling of claims, has been "deficient."⁷⁸ Such factors may well account for some individual U.S. firms' inability to achieve significant sales in Japan, just as they may explain some individual Japanese firms' inability to achieve a higher level of sales in world markets. However they do not begin to explain why the entire U.S. semiconductor industry -- all companies combined -- has never achieved more than a 10-12 percent share of Japanese consumption for any sustained period. Moreover, it is unclear why if Japanese price, quality, customer service and delivery are so superior, Japanese firms have never achieved leadership in a major world market outside Japan.

a. Japanese Firms Have Also Demonstrated Numerous Performance Shortcomings

EIAJ has gathered numerous anecdotes about problems experienced by Japanese customers in their dealings with U.S. firms, ranging from poor product quality⁷⁹ to uncooperative local sales staff⁸⁰ to failure to meet delivery dates⁸¹ to inadequate allocation of product during a shortage period.⁸² Such anecdotes are of little value in

⁷⁸ EIAJ Brief, p. 10.

⁷⁹ EIAJ Brief, pp. 11-17.

⁸⁰ EIAJ Brief, "Case 1," pp. 19-20.

⁸¹ EIAJ Brief, "Case 3," pp. 20-21.

⁸² EIAJ Brief, "Case 5," pp. 22-23.

determining why a disparity in market shares as dramatic as the one at issue here has developed. While cases can undoubtedly be cited of individual U.S. firms' performance shortcomings, numerous cases can be cited of similar shortcomings by Japanese semiconductor firms:

Quality

- CASE 1: FAULTY NEC MEMORY CHIPS FORCE DIGITAL EQUIPMENT CORP. TO SUSPEND SHIPMENT OF MICROVAX II WORKSTATION. NEC-produced 256K DRAMs forced the suspension of Digital Equipment Corp.'s Unix-equipped Microvax due to a quality problem that only became evident after the chips were built into the computers.⁸³
- CASE 2: JAPANESE PRODUCERS UNABLE TO MEET QUALITY STANDARDS OF U.S.-BASED SEMICONDUCTOR MANUFACTURER IN JAPANESE MARKET. A high volume semiconductor product made by U.S. based manufacturer "U.S. Company A" is being delivered in Japan with less than 14 parts per million (ppM) defects whereas the best Japanese competition is at 20 ppM.

⁸³ DEC had been so concerned about an apparent "bug" in its system that it assigned 30 senior engineers to track it down, leading eventually to the discovery of the problem NEC component. The article reporting this episode is attached as an Appendix. Some producers' names and certain products are coded to avoid retaliation by Japanese customers/competitors. The specifics of these cases are on file at Dewey, Ballantine, Busby, Palmer and Wood.

CASE 3: JAPANESE PRODUCERS UNABLE TO MEET QUALITY STANDARDS OF U.S.-BASED SEMICONDUCTOR MANUFACTURER IN JAPANESE MARKET. High volume memory product made by U.S. based manufacturer "U.S. Company B" is being delivered in Japan with less than 70 ppm defects whereas the best Japanese competition is at 100 ppm.

CASE 4: U.S. SEMICONDUCTOR MANUFACTURER SHIPS PRODUCT INTO JAPAN WITHOUT A SINGLE QUALITY REJECT FOR TWO YEARS . . . JAPANESE FIRMS STILL BUY INFERIOR QUALITY JAPANESE PRODUCT. High volume (one million units) discrete product has been delivered to customers in its present configuration for two years by U.S. based manufacturer "U.S. Company C" without a single quality rejection. The number one producer of this product in Japan, "Japanese Company A", is known as having the poorest quality in the industry. Apparently Japanese customers are not so sensitive to poor quality when the products are made by domestic producers.

Delivery

CASE 1: JAPANESE MANUFACTURER ABRUPTLY STOPS DELIVERIES TO U.S. KEYBOARD MANUFACTURER -- U.S. MANUFACTURER FILLS THE VOID. A Japanese chip supplier became the major supplier of or a semiconductor product to a large keyboard manufacturer during the early 1980s. They abruptly stopped deliveries and U.S.

Company D was asked by this desperate customer for help. Several other customers of U.S. Company D (who were system manufacturers) called and asked U.S. Company D to fill the gap created by the Japanese firm's non-delivery so they could get keyboards.

CASE 2: JAPANESE SEMICONDUCTOR PRODUCER FAILS TO DELIVER.

Both U.S. Company E and a Japanese competitor were requested to deliver pre-production quantities of a CMOS logic chip in five days. Company E delivered, the Japanese competitor did not.

CASE 3: U.S. BASED SEMICONDUCTOR HAS BETTER RECORD OF ON-TIME DELIVERY THAN JAPANESE COMPETITOR. U.S. Company E has a 95% on-time delivery record for a particular high volume product. The best Japanese competition is at 91%.

CASE 4: JAPANESE SEMICONDUCTOR PRODUCER FAILS TO COMMIT TO TIGHT DELIVERY. U.S. Company F committed to achieve a 4-week delivery on a particular semiconductor product. The best Japanese competitor would not make such a commitment.

CASE 5: JAPANESE MANUFACTURER DROPS MARKET PRICE AND FAILS TO DELIVER PRODUCT. A major U.S. industrial corporation used an advanced microprocessor designed by U.S. Company G with a Japanese second source. The manufacturer furiously negotiated to get UP9 close to the low Japanese price. When it came time

for first year production, U.S. Company G was the 100% supplier as the Japanese competitor could not deliver. The second production year left U.S. Company G supplying all of the high performance parts and higher-than-expected volume of the low speed devices due to the Japanese poor delivery record.

b. EIAJ Cannot Explain Why Not Even One U.S. Company Holds a Significant Share of Japanese Sales

EIAJ and SIA can exchange such anecdotes indefinitely, but little light will be shed on why the overall U.S. share of the Japanese market is so small. In a multi-billion dollar market characterized by tens of thousands of transactions, numerous instances of performance problems -- on the part of both U.S. and Japanese companies -- can be expected to occur. Such factors may even explain the competitive failure of individual companies.⁸⁴ They do not, however, explain why no U.S. company has ever achieved more

⁸⁴ Japanese companies in the late 1970s and early 1980s placed a great emphasis on delivering high quality computer memory components to key U.S. consuming firms, and in 1980, Hewlett-Packard revealed that incoming shipments of U.S.-made 16K RAMs had a higher failure rate than those of Japanese producers. In other semiconductor product areas, however, the Japanese industry did not enjoy a quality edge then and does not enjoy one today -- the reverse is true -- yet Japanese consumers have still preferred the inferior domestic product. Moreover, in the commodity memory area, U.S. firms quickly responded to the Hewlett-Packard findings, and by 1982, Merrill Lynch reported that the quality gap had been closed. Paine Webber Mitchell Hutchins Inc., "U.S. and Japanese Competition in the Semiconductor Industry," December 20, 1982.

than a tiny fractional share of the Japanese market, under any circumstances, in the ten years since Japan's formal barriers were removed.

The experience of TI Japan is instructive in this regard. Texas Instruments is the largest semiconductor firm in the world, and an acknowledged leader in technology worldwide. None of TI's competitors would suggest that the company is not price-competitive. TI has been manufacturing semiconductors locally in Japan for approximately 15 years, and now operates a number of production facilities in Japan. TI Japan is staffed from top to bottom with Japanese nationals; its device quality and customer service are reportedly at least the equal of, if not superior to, those of the other leading semiconductor producers in Japan.⁸⁵ If EIAJ's basic argument is correct -- that is, if local manufacturing, longstanding presence, price, quality and customer service are the ultimate determinants of performance in Japan, then TI Japan should have one of the largest market shares of any company in Japan, a share approximating TI's share in other world markets.

⁸⁵ EIAJ's counsel, Mr. Tanaka, testified before the U.S.I.T.C. in 1979 that TI "is a company which is leading the way in terms of investment, research, product development, cost and price reduction, and improvement in productivity. It is a company which I can attest causes great concern to the Japanese companies that are members of the trade association that I represent." U.S.I.T.C. Inv. No. 332-102, Transcript of May 31, 1979, p. 251.

Instead, TI Japan -- after over 15 years of intensive effort, still holds less than 5 percent of the Japanese market, and sells much of its output in markets outside of Japan.⁸⁶ TI Japan's experience strongly suggests that nonmarket factors have operated to restrict U.S. firms' penetration of the Japanese market. If such factors were not in fact present, then during the past decade at least some strong and aggressive U.S. companies -- if not TI, then Intel, AMD, Motorola and others -- would have found and exploited opportunities in the Japanese market and rapidly expanded their market share, as they have done in other world markets. That has not happened.

In looking at individual instances where U.S. devices were not purchased, or where U.S. sales vanished when a competing Japanese product became available, the Japanese invariably cite factors such as price, quality, customer service and conditions of delivery. Such explanation have the value that they are, in any given instance, virtually impossible to disprove. In any open market, the value of the product to the purchaser can be measured according to five basic criteria:

- (1) Price
- (2) Quality
- (3) Conditions of delivery
- (4) Performance
- (5) Customer service

⁸⁶ Source: Dataquest.

Market forces ensure that it is only in extremely rare cases that a supplier is superior in all five categories,⁸⁷ and when that occurs, the producer can be expected to capture a commanding share of the world market. In explaining why a given purchase was not made, therefore, it is almost always possible to find one of these five factors to cite as a plausible explanation as to why the purchase was not made.

For this reason, aggregate market share data is a much better indicator than individual anecdotes of whether or not the market is functioning normally. If Japanese firms really were consistently superior in all five areas -- price, quality, performance, customer service, and delivery -- then they should have a dominant market share in Europe, East Asia, and all other world markets as well as Japan. However, they do not hold even one third of any major world market outside of Japan. U.S. firms outsell their Japanese competitors 55 percent to 12 percent in Europe and 47 percent to 29 percent in the Rest-of-World (ROW). These figures indicate that nonmarket factors are crucial in influencing purchasing decisions by Japanese semiconductor consumers.

⁸⁷ For example, if a product is clearly superior in all other attributes, the price usually rises. If price, quality, and performance are superior, demand will accelerate until at some point, delivery suffers.

2. The Low Level of U.S. Sales in Japan is not Attributable to Differences in Product Specialization and Consumption Patterns

EIAJ argues (pp. 8-10) that U.S. firms' performance in Japan cannot be compared to that in other world markets because the Japanese market is fundamentally different in composition from those markets. EIAJ states that U.S. firms' strengths are in computer and communications circuits, whereas Japanese firms' strength lies in consumer ICs; since consumer products make up such a significant portion of total Japanese end-use markets, the argument goes, it is natural to expect a stronger Japanese performance in Japan. This argument, like EIAJ's market share numbers, is a distraction; it is based on unstated -- and untrue -- assumptions concerning the nature of the semiconductor industry as well as the structure of the semiconductor markets in the U.S., Japan, and Europe.

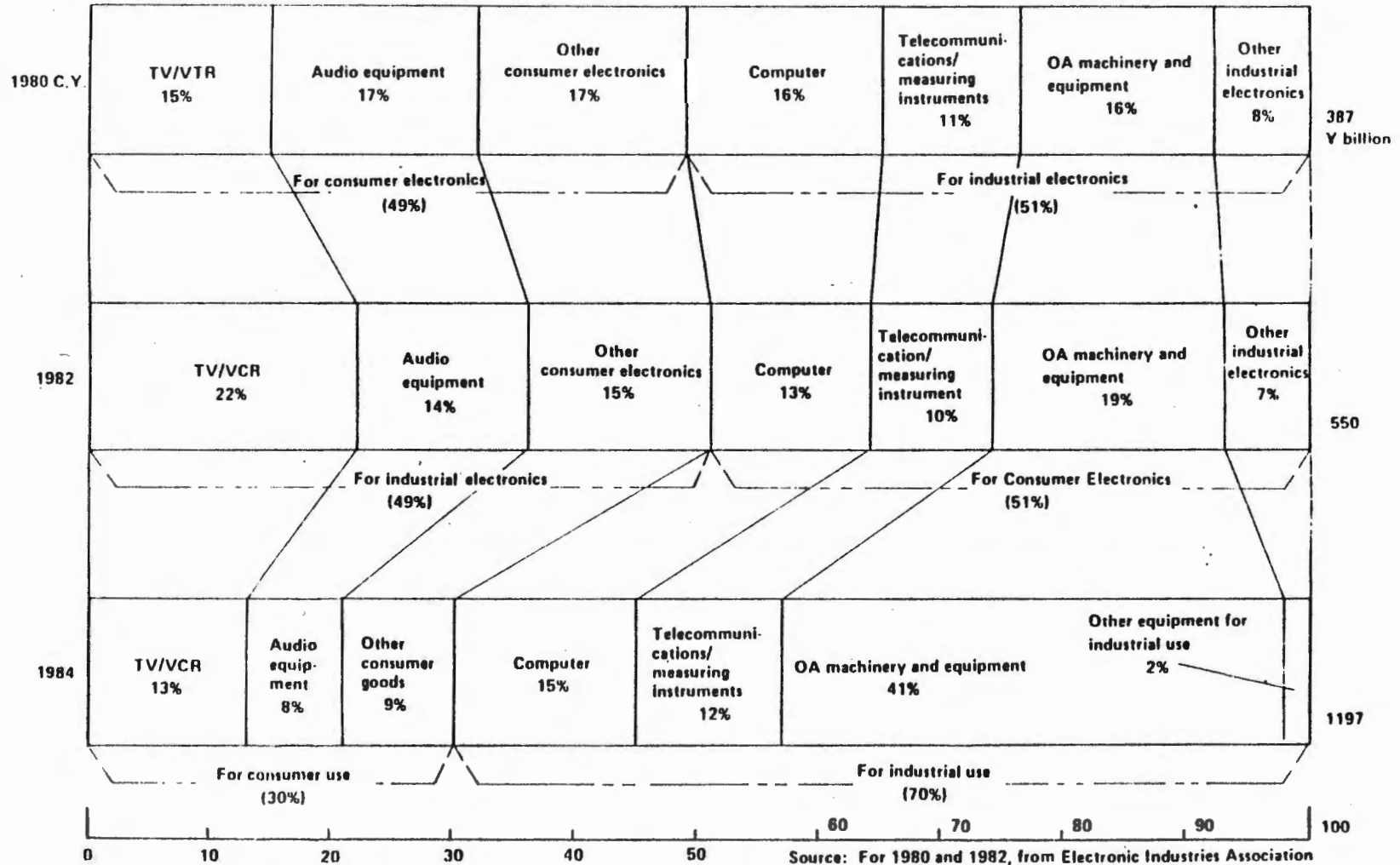
The fundamental premise underlying EIAJ's argument is the notion that differences in the end-use markets (i.e., consumer, computer, etc.) result in different semiconductor product requirements. In fact, the circuit application -- not the end-use market -- dictates the type of semiconductor device needed in a particular product. Similar or identical semiconductor device requirements exist across the consumer, industrial, computer and telecommunications product sectors. Microprocessors, both 4-bit and 8-bit, for example, are found in consumer products and in computers. Linear amplifiers are common both to telecommunication and consumer

Figure 11

1985 MITI Presentation Showed that in 1984 Consumer Products Accounted for only 30 Percent of Japanese IC Consumption

(Appendix 7)

Changes in the Relative Weight of Different Fields in the Demand for IC's in Japan



Source: For 1980 and 1982, from Electronic Industries Association of Japan, and for 1984, from the Electronic Machinery Section of the Ministry of International Trade and Industry.

products. Power transistors are found in products from all of these end use segments.

The fact that applications, not end use, is the relevant point of reference is underscored by the fact that the share of the consumer market in the total Japanese end-use market mix has plunged dramatically since 1980 without producing a corresponding change in U.S. firms' market share. In a recent speech by MITI's Director of Industrial Electronics, the share of Japanese IC consumption accounted for by consumer electronics products was reported to have dropped from 49 percent in 1980 to 30 percent in 1984 (Figure 11). If U.S. firms' low share of Japanese sales were really attributable to the prominence of consumer electronics in the end market mix, as the EIAJ Brief suggests, then U.S. firms' market share should have dramatically increased between 1980 and 1984, as the composition of the Japanese market shifted sharply away from their "weak" area. That did not happen.

When viewed appropriately in terms of product mix, rather than end use market, the Japanese market is not significantly different than the U.S. market, or, for that matter, from Europe or the Rest-of-World (Figure 12).⁸⁸

⁸⁸ EIAJ has elsewhere published statistics showing the mix of IC products for 1984 for the Japanese market, and show that a close correlation, its own comparisons with the U.S. market:

(Footnote continued)

FIGURE 12

Applications Categories in the U.S., Japanese
and European Markets

(Percent of Total Semiconductor Market)

	<u>U.S. Market</u>	<u>Japanese Market</u>	<u>European Market</u>
Analog	13%	17%	17%
Digital Bipolar	24%	13%	16%
MOS logic	14%	14%	14%
MOS memory	22%	17%	17%
CMOS	10%	12%	12%
Total solid state	100%	100%	100%

Source: SIA statistics

These figures show how similar the Japanese market is to that of Europe, where U.S. firms have always outsold the Japanese producers by a wide margin. EIAJ's attempt to characterize Europe as a "technically backward" market is not borne out by these figures, which show that Europe and Japan have a virtually identical product mix for analog, MOS logic, MOS memory and CMOS and are within 3 percentage points of each other with respect to digital bipolar.

EIAJ states (pp. 8-9) that consumer electronics products account for 47 percent of the semiconductor end uses in Japan but only eight percent in the U.S. -- the inference being that U.S. firms are not competitive in

(Footnote 88 continued from previous page)

	<u>Japanese Market</u>	<u>U.S. Market</u>
Digital bipolar	16%	29%
Analog	23%	15%
MOS Logic	26%	30%
MOS Memory	30%	31%

While some percentage differences exist between the digital bipolar and analog segments in terms of market share, these differences are not crucial when volume is evaluated:

(\$000) 1984

	<u>Japanese Market</u> ((\$000))	<u>U.S. Market</u> ((\$000))
Analog	1418	1488
Digital bipolar	1011	2788

The U.S. industry can supply any analog or digital bipolar device required by the market in either the U.S. or Japan.

JAPANESE STATEMENTS ABOUT THE SIZE OF JAPANESE END-USE MARKETS VARY
FROM MONTH TO MONTH AND FROM FORUM TO FORUM

Japanese Semiconductor Consumption by End Use in 1984

	<u>EIAJ "Pie Charts" ^{3/} Distributed in 1985</u>	<u>EIAJ Statements ^{2/} in this Case</u>	<u>MITI Figures ^{1/} 1985</u>
Consumer	41	47	30
Communications	8	10	12
Data Processing	36	36	56
Industrial/ Other	15	7	2

1/ Figure 11

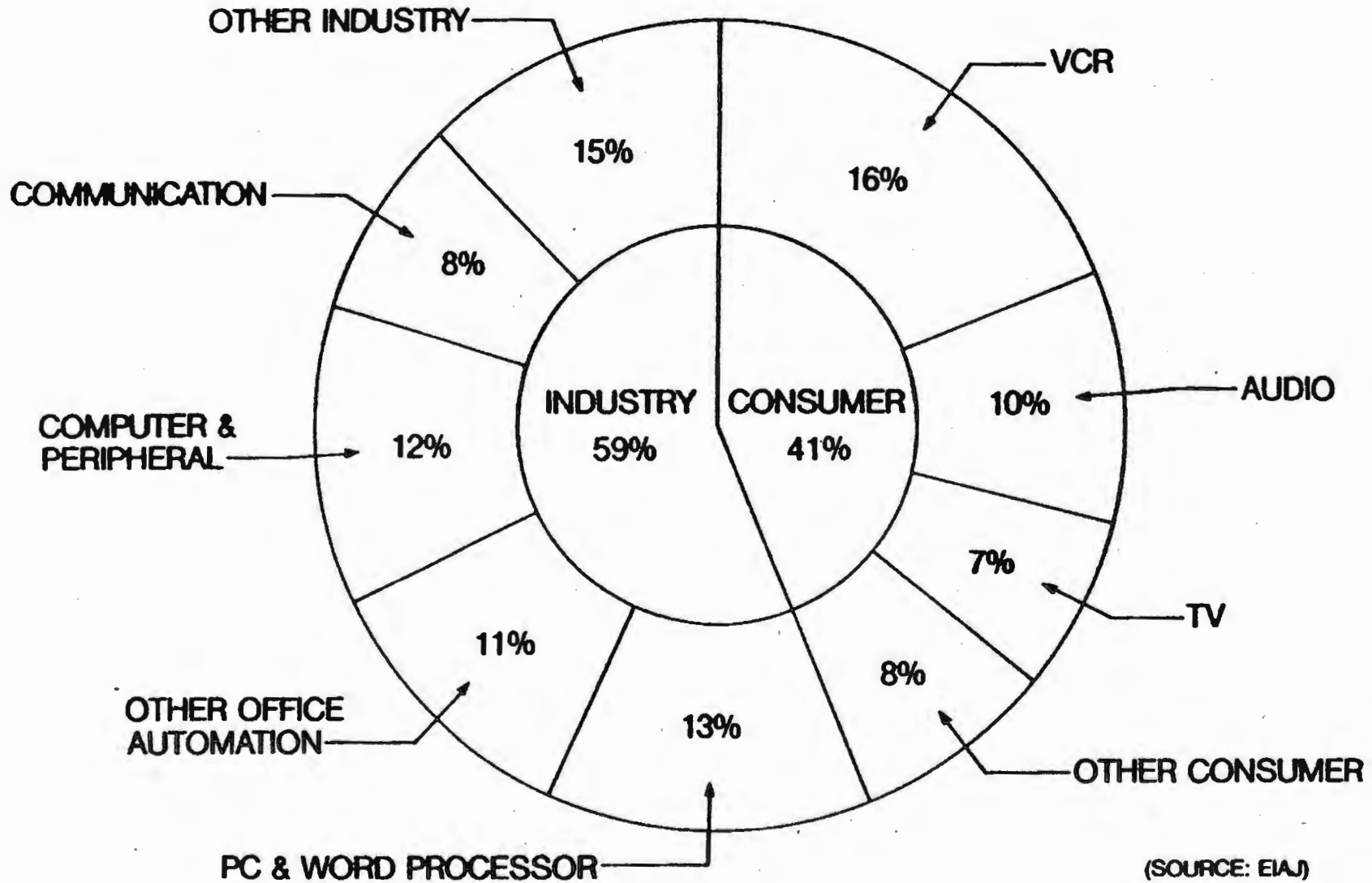
2/ EIAJ Brief, Appendix I, p. 2. Data processing = Computer and peripheral, PC and word processor, and other office automation.

3/ Figure 14 Communications includes measuring instruments. Data processing = computer, OA machinery and equipment.

Figure 14

EIAJ'S ESTIMATE OF THE SIZE OF THE JAPANESE CONSUMER MARKET
IN THIS CASE (47 PERCENT) IS CONTRADICTED BY OTHER EIAJ
PRESENTATIONS OUTSIDE OF THIS CASE

JAPANESE END-USE MARKETS OF SEMICONDUCTOR (1984)



(SOURCE: EIAJ)

TOSHIBA

devices for use in consumer products, thus explains their low share of Japanese sales. EIAJ's 47 percent estimate of the size of the consumer market is contradicted by another earlier EIAJ estimate of 41 percent (Figures 13 and 14) and by MITI's estimate of 30 percent (Figure 11). However, whichever of these conflicting figures are used, and even if EIAJ's basic assumption is taken as given -- e.g., U.S. firms are less competitive with respect to consumer end-use markets -- over half the Japanese market still consists of end-products in which U.S. firms are superior or competitive, e.g., industrial, communications and information products.⁸⁹

Moreover, EIAJ's assumption is not correct. U.S. firms produce competitive devices for all segments of the consumer market -- VCR, audio, television, and others. In some consumer device product areas, such as Dolby circuits, the U.S. industry holds a clear edge over its Japanese counterparts, reflected in a dominant market share in every major world market -- except Japan.

V. JAPANESE INVESTMENT LEVELS ARE NOT MARKET RELATED AND LEAD TO DUMPING

SIA's Petition noted that Japanese semiconductor producers' investment levels -- \$3.2 billion in 1984 -- far exceeded the growth in market demand, and as a result, have

⁸⁹ That fact is not reflected in U.S. sales levels in Japan.

caused severe overcapacity problems in the industry. EIAJ characterizes Japanese investment behavior simply as a far-sighted anticipation of future market demand, and portrays U.S. firms as too conservative in their investment strategies, with the result that they lose market share during peak demand periods when they cannot completely satisfy customer demand.

In fact, the Japanese producers have consistently made massive investments which vastly exceeded world demand growth rates, and Japanese investment levels are currently increasing at a rate which greatly exceeds the long term growth of world demand. Since the early 1970s Japanese capacity expansion drives have been followed by slumps in demand; this ultimately produced aggressive export drives to dispose of surplus production abroad.⁹⁰ Japanese dumping during such recessionary periods has intensified the severity of recessions for U.S. firms and diminished their ability to invest in anticipation of the next upturn in the business cycle -- in effect, the Japanese firms have shifted

⁹⁰ Thus, the Japan Economic Journal reported on October 22, 1974 that "If the (semiconductor) industry really follows through with this ambitious equipment investment program in spite of the current business slump, its total production in the current fiscal year will reach approximately \$500 million, a sharp gain of 24.4 percent over the preceding fiscal year....The trouble, however, is that the markets for new IC products capable of taking over the leadership position from desktop electronic calculators and color TV sets have just started forming and will take a considerable length of time to mature. The only possible way out for sharply increased IC production, therefore, is exports."

the adverse consequences of their investment decisions onto U.S. firms.

The nature and extent of Japanese overinvestment become more apparent when U.S. and Japanese investment trends are compared.

A. U.S. Industry Capacity Growth

U.S. industry capacity has remained roughly in alignment with the fluctuations in U.S. market growth. Figure 15 shows the peaks and valleys of U.S. semiconductor market growth. Capacity remained in rough alignment with these trends; spurts of growth were followed by periods of adjustment. Throughout the period 1965-84, the U.S. semiconductor industry supported a 16.5 percent annual growth rate in the world market⁹¹ and met peak growth rates of 30 percent. While major variations occur by product line, long term industrywide capacity expansion at a rate in excess of 30 percent is unjustified by long term demand trends.⁹²

B. Japanese Capacity Growth

Japanese producers are currently investing at a rate which will enable them to grow 33 to 44 percent per

⁹¹ This average growth rate is expected to persist through the later 1980s.

⁹² An analysis of mean annual growth rates of worldwide and U.S. based shipments from 1965 to present shows that annual U.S. growth ranged from 10.7 to 23.7 percent and worldwide growth rates have ranged from 12 to 18.3 percent. The average secular rate of semiconductor demand growth is around 16.5 percent.

Figure 15

GROWTH IN U.S. SEMICONDUCTOR DEMAND, 1966-85

<u>Period</u>	<u>Annual Growth Rate</u>
1966-71	0
1971-74	31%
1974-75	(18%)
1975-79	25%
1979-82	7%
1982-84	31%
1984-85	(29%)

year from 1985 to 1988. In 1983 Japanese firms out-invested U.S. merchant firms for the first time, and will widen this gap through the balance of the decade. Figure 17, which charts the rate of capital spending as a ratio to revenue for U.S. vs. Japanese firms, shows that from 1985 to 1988 the Japanese will be investing from 30 to 40 percent of revenue each year. In the semiconductor industry today, one dollar of new investment leads to about \$1.10 in sales volume;⁹³ these figures imply, therefore that over the long term the Japanese industry is planning to grow at a rate of 33 to 44 percent per year, when the market is growing at a long term rate of 16.5 percent per year. This will produce a chronic and growing overcapacity situation, even in "good" economic times.

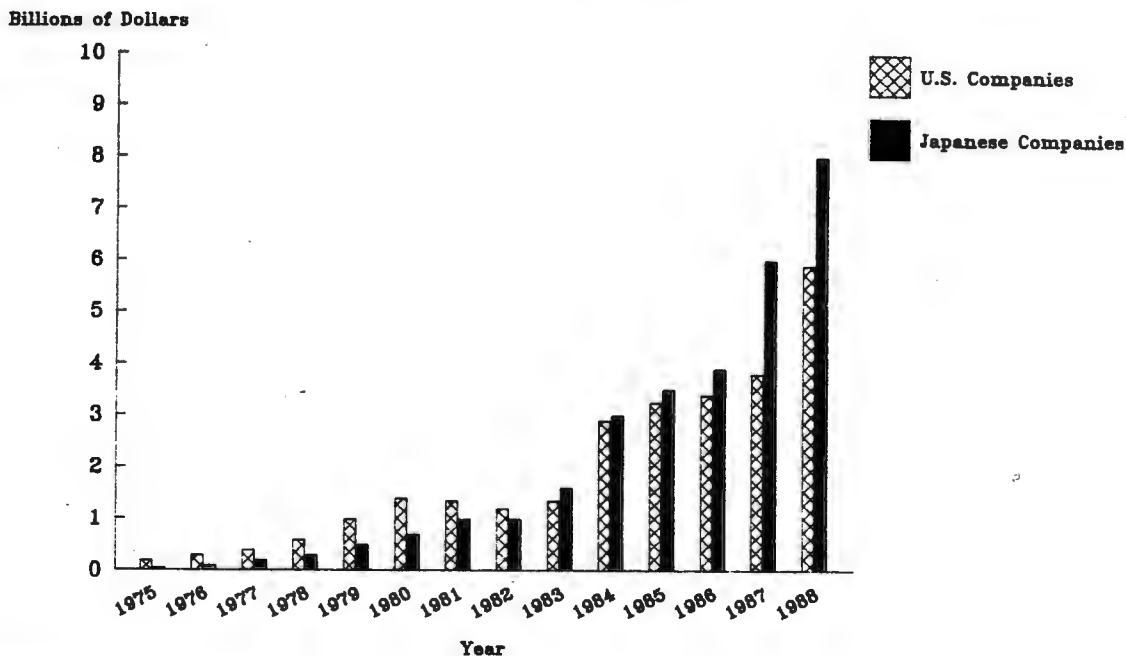
EIAJ notes that in June 1985, MITI conducted a survey of Japanese companies in which the companies projected that for the fiscal year ending March 31, 1986, IC investments would be 606 billion yen, a 21 percent reduction from the previous year. However, this still represents 35 percent of Japanese firms' 1985 sales.⁹⁴ Assuming a sales-to-assets turnover ratio of 1.2, this level of investment

⁹³ Historically, U.S. firms sales volumes have been equal to 1.7 times gross fixed assets, but in recent years this "turnover ratio" has been closer to 1.1. Japanese firms have historically had lower turnover ratios, but their improved yields suggest that today they probably have the same ratio as U.S. firms.

⁹⁴ The 1985 sales level for the Japanese based industry in ICs will be about 10 percent less than in 1984, or about \$7 billion.

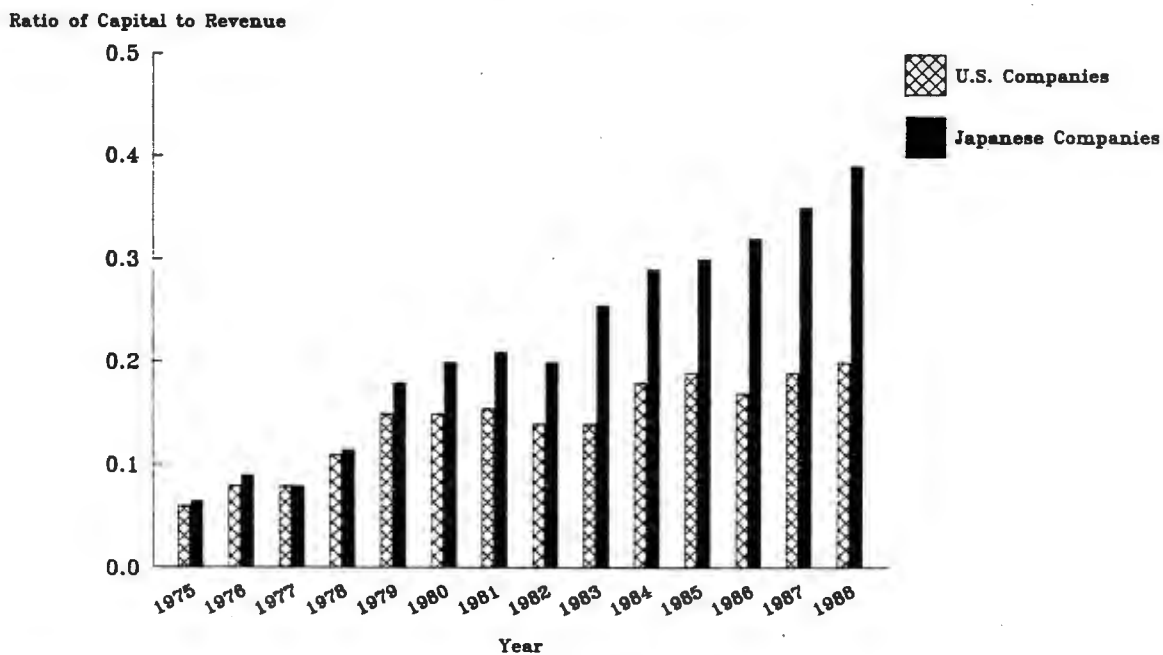
Figure 16

Capital Spending North America vs Japan



Source: Dataquest

Figure 17 Capital to Revenue Ratios North America vs Japan



Source: Dataquest

would support a sales growth of 38 percent, a level that remains far in excess of the long term growth rate of the industry.⁹⁵

EIAJ contends that Japanese producers have not faced the same volatile swings in demand that U.S. producers have experienced. Part of this is due to the fact that the Japanese market is not as volatile as the U.S. market, but it is also due to the treatment of American firms as residual suppliers in the Japanese market. While the Japanese market shifted from a 15 percent growth rate in the 2nd Quarter of 1984 to a 15 percent decrease in the 1st quarter of 1985, the U.S. companies' sales in the Japanese market shifted from a 32 percent quarter to quarter increase to a 29 quarter to quarter percent decrease in that period.⁹⁶

EIAJ justifies Japanese investment patterns simply as farsighted, arguing that U.S. merchant companies are unable to meet American demand surges during periods of

⁹⁵ It is interesting to note that the 35 percent of sales figure calculated above assumes a \$7 billion 1985 sales level. In calculating the U.S. share of the Japanese market, EIAJ has disputed SIA's numbers with respect to the size of that market, and contended that the Japanese-based industry has \$1 billion less sales in Japan than SIA calculates. If one accepts EIAJ's smaller sales figure as correct, then the 606 billion yen investment figure becomes an even more incredible 42 percent of the Japanese firms' sales. This means that if the Japanese producers really believed the sales numbers which they have advanced in this case -- which is doubtful -- then they are investing to grow at a phenomenal 48 percent rate.

⁹⁶ See Memorandum in support of the SIA petition, p. 73, figure 29.

MEMO TO
HITACHI DISTRIBUTORS
(FEBRUARY, 1985)

UNBEATABLE

Figure 18

PRICE LEADERSHIP

WE'RE NUMBER 1

40% BELOW INTEL AND AMD

15% - 20% BELOW OTHER JAPANESE SUPPLIERS

PRICE CROSSOVER

128K - 1.6 x THE 64K

256K - 2 x THE 128K

COST/BIT
ATTENTION

CMOS PREMIUM SLASHED

27C64 - 25% OVER NMOS

AND HEADING FOR PARITY

WIN WITH THE 10% RULE

HN4827128, HN27256

FIND AMD AND INTEL SOCKETS....

QUOTE 10% BELOW THEIR PRICE....

IF THEY REQUOTE,

GO 10% AGAIN....

DON'T QUIT TILL YOU WIN!

HN27C64

WIN FUJITSU BUSINESS,

USE THE 10% RULE

25% DISTI PROFIT MARGIN

GUARANTEED

HN4827128, HN27256, HN27C64

HITACHI EPROMS

booming demand. This argument is irrelevant to Japanese long term overinvestment, which dramatically exceeds the rate of long term demand growth, and strongly suggests an intent to dominate, rather than simply anticipate market growth. This conclusion is reinforced by the Hitachi "10 percent" episode, in which a leading Japanese producer demonstrated a willingness to "buy" market share regardless of cost or profitability (Figure 18), and the proliferating instances of Japanese dumping in 1985.

VI. THE RELIEF REQUESTED BY SIA IS APPROPRIATE. SIA SEEKS REAL MARKET ACCESS, NOT A GUARANTEED MARKET SHARE.

SIA has several basic objectives in this case. First, it seeks an increase in U.S. firms' sales in the Japanese market, commensurate with their demonstrated competitiveness in other world markets. Such increased sales should reflect the conclusion of long term contracts or commitments (2-3 years) between the major Japanese users and U.S. merchant suppliers. Second, SIA seeks an end to dumping by Japanese producers. This is essential to prevent dumping from eliminating a significant U.S. presence in the product areas which are essential to the long run viability of the entire industry.⁹⁷ Finally, SIA seeks to accomplish

⁹⁷ Mostek, one of the U.S. firms most severely injured by Japanese dumping of commodity memory products, has ceased operations. National, Motorola, and Intel have withdrawn from the production of dynamic RAMs. Intel stated that "We will stand and fight in EPROMs," but this product area is also under intense pressure from Japanese dumping. Electronic News, October 14, 1985; Washington Post, October 18, 1985.

these objectives in a manner which is responsive to the needs of the U.S. semiconductor industry's customer base. The relief requested by SIA is intended to achieve these objectives.

SIA does not, as EIAJ contends, seek a "guaranteed market share" in Japan. It does seek real market access, manifested in an increase in the U.S. share of the Japanese market commensurate with the U.S. industry's demonstrated competitiveness. SIA has asked that market opening be measured in terms of increased sales, rather than further Japanese "market-opening" measures, because prior "market-opening" measures have been largely devoid of substance, and, in some cases, have been subverted by Japanese "countermeasures."

In its petition, SIA proposed that as an interim goal, it would be reasonable to expect that true market liberalization would lead at a minimum to the U.S. share of the Japanese market becoming equal to Japan's share of the U.S. market in the near term -- a recommendation which prompted EIAJ's charge that SIA seeks "guaranteed market share."⁹⁸ SIA is only asking for free market access in Japan--that is, the dismantling of the anticompetitive structures and trade barriers which restrict U.S. market

⁹⁸ EIAJ Petition, pp. 84-90. During SIA's discussion with U.S. officials with respect to Japanese market barriers prior to the filing of its case, it was often asked what it believed the U.S. share of the Japanese market would be if all barriers were removed. The language in question was a response to that query.

access. Given the U.S. competitive performance in other parts of the world, it is reasonable to assume that if this objective is achieved, the U.S. share of the Japanese market will be not just equal to, but substantially greater than the current Japanese share of the U.S. market.

EIAJ protests SIA's request for a cost-price model to detect Japanese dumping, but simply ignores the real problem such a model is intended to address -- Japanese dumping and predatory sales tactics, as has been manifested by Hitachi's so-called "ten percent rule." EIAJ is silent on how such practices are to be forestalled in the future (and in fact does not mention the Hitachi episode in its Brief). If the U.S. Government can devise an alternative mechanism to the cost-price model which is effective in preventing Japanese dumping and predation, SIA will gladly accept such a remedy. However, it believes that the cost-price model offers the best way to prevent dumping without at the same time impeding competition conducted according to the internationally accepted norms of business behavior.

CONCLUSION

The U.S. semiconductor industry has pursued an international competitive strategy since its inception, and has always supported the concept of free trade and open world markets. That is still the case today.

The U.S. industry has pursued market access in Japan, through negotiations, for over twenty years. The result has been a series of Japanese commitments which have

not been kept, continued denial of market access to U.S. firms, and now, widespread dumping by Japanese producers which is eliminating important segments of our industry.

The U.S. semiconductor industry has never resorted to litigation (apart from patent cases) prior to this year. Even in this case, SIA does not seek the imposition of retaliation on Japanese firms, but a U.S. negotiating effort to secure the Japanese Government's adherence to existing commitments.

SIA notes EIAJ's comment (p. 2) that "if the SIA truly seeks expansion rather than the restriction of trade, and greater participation in the Japanese market, then EIAJ agrees with these objectives." Because SIA and EIAJ do share these common objectives, a resolution of the present dispute is possible. The U.S. semiconductor industry stands ready to serve the Japanese market with the highest performance, highest quality products in the world.

Respectfully submitted,

Thomas R. Howell
R. Michael Gadbaw
Timothy J. Richards, Economist
Alan Wm. Wolff

DEWEY, BALLANTINE, BUSHBY,
PALMER AND WOOD

Counsel for the Semiconductor
Industry Association

October 22, 1985

APPENDIX A

SELECTED PRESS CLIPPINGS

Only a few face the toughest test

In selling to Asia, Europe sees Japan as quite distinct from the rest of the region. Japan is the tough one, where obstacle after obstacle is in the exporter's path. Many companies give up before they even start. But two which have not given up are BMW, the West German car company, and Siemens, the electrical and electronics giant, also from West Germany.

A few years ago, the then West German minister for industry told his nation's companies not to grumble about the Japanese, but to take up the challenge. BMW responded to the call. As one BMW executive put it: "We are willing to learn to speak Japanese — literally and in the metaphorical sense."

In 1982, BMW replaced its local Japanese agent with a wholly owned subsidiary. Sales at that time were 3,500 cars a year. Two years later, after putting in a considerable effort, BMW had doubled sales to 8,000, bringing BMW's share of foreign-car imports to 20%. But 8,000 cars is still a tiny number in relation to the total Japanese car market.

BMW took the view that it must have Japanese staff, but found a great deal of difficulty in obtaining suitable people. The local staff it did recruit expected to do things the Japanese way and to adapt the product to the Japanese style. But BMW was convinced that one of its best selling points was its very foreign-ness.

It kept Germans in the top marketing posts and promoted the car as it would anywhere else — on prestige, quality and flair. This policy seems to have succeeded in giving the cars something of a cult following. But even with this success, BMW is clearly not impressed by the openness of the Japanese market.

Its comment on import procedures — the checking which many regard as a non-tariff barrier — is typical. A BMW official drily remarked: "We are inured to it without being happy."

BMW's hard-won progress in Japan contrasts vividly with its success in other Asian markets. The company's market share in East Asia is well above its world average market share of 1.3%. In fact in Thailand, its best regional market, the share is more than 10%. All this is done, unlike in Japan, without the need to supplant local agents.

In fact, BMW's Southeast Asia director, Henrich Heitmann, is an ardent supporter of using agents in the region. In these countries he regards it as useful to cooperate with well-entrenched local companies so as to combine their local knowledge with the special appeal of BMW cars.

Siemens is more outspoken about the difficulties of the Japanese market. According to Gernot Oswald, an executive director in the components division, "Japan is just not buying from outside if firms have their own suppliers. So what you can do there is mainly to fill a temporary gap with a product which is not readily available there. As soon as the product is available from local Japanese sources, your chances go down to very close to zero."

This active discrimination against foreign products does not apply, says Oswald, in other parts of Asia. "Our relative market share in Hongkong, Singapore or Taiwan is much, much higher than in Japan. But unfortunately Japan is a much bigger market."

Summing up Siemens' view of the regional market, he said: "Our ambitions for the Far East are high compared with what we have, but realistically low with respect to expectations that Japan will be a completely open market very soon."

He noted that the Japanese say "nice words around the world" and that the European politicians are keen to take aggressive action. But as to results: "I have some doubts and I have specifically doubts about the speed, the pace of such results . . . I don't think the Japanese market will change overnight."
— James Bartholomew

THE JAPANESE VIEW

A relationship of weariness and wariness

By Charles Smith in Tokyo

Europe's suspicions of Japan are returned by the Japanese — but Japan is in no way enthusiastic about Europe as Europe is about Japan. Japanese trade officials complain that Europe seems to grumble almost as much about its unbalanced trade relationship with Tokyo as the US, even though the European Community's Japan deficit has been relatively stable in the past few years while the US trade gap with Japan has expanded dramatically. Officials and others who deal with the political aspect of the relationship generally start by stressing the sheer lack of content — at least by comparison with the immensely important Japan-US relationship.

Despite these grouses, it would be wrong to give the impression that nothing ever stirs in the Japan-Europe relationship. Notwithstanding a marked lack of headlines, and a general air of weariness on both sides, there are signs that communications along the neglected third side of the triangle

linking Tokyo, Washington and Brussels may soon become a little more lively.

The position with regard to Japan-EC trade, the main fulcrum for Japan's economic relationship with Western Europe, is that the surplus in Japan's favour is due to expand again this year after shrinking marginally in 1984 (to US\$10.1 billion, according to Japanese customs clearance figures, from the previous year's level of US\$10.4 billion). The fact that the wider gap will result from a shrinkage of Japanese imports is dismal news for the EC, especially since Japan's purchases from Europe seem to be reverting more and more to traditional food and beverage items and away from the sophisticated machinery the Europeans would like to sell.

The good news is that the two sides may just conceivably have started talking to each other more constructively about trade problems that at any time in the past few years. The Japan-EC Trade Expansion Committee, a body modelled on a similar US-Japan entity and originally proposed by Japan's Foreign Minister, Shintaro Abe, is claimed by Japan to have got down to "serious and constructive" business at its second session this year (held in Tokyo in May).

Apart from hopes vested in the committee, Japan claims that its action programme on trade and economic policy, unveiled at the end of July, should make life easier for European traders. The programme's 1,800 tariff cuts include 70 made in response to EC requests (though nearly 60 more items cited by Europe were not covered). Japanese officials also say that the simpler certification procedures for pharmaceuticals that form part of the programme should open up op-

Stretch Terms to Stir Sales; See Hazards

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“terms” fray, albeit reluctantly, both to protect their established customer base and, when an opportunity presents itself, to move surplus product. “It’s an absolutely ridiculous way of doing business,” said Avnet chairman Tony Hamilton. Competitors agree, and concern is mounting that should such high-discount transactions continue to mushroom, they will further sabotage already-eroded ASPs on commodity and proprietary devices alike. Whispers abound that Hamilton/Avnet and Schweber are leading the assault on 2 per cent 10, which both distributors vigorously deny. “A lot of what you’re hearing is smoke generated

by salespeople and perhaps even by some customers.” Schweber president Rob Johnson commented. “I think salesmen have to have alibis why they lost an order.” Thus far, quotes of 10 and 15 per cent discounts have been spotty. “It’s only an amateur-type distribution executive who offers such an arrangement,” Mr. Hamilton maintained. “It shows a company is in cash trouble,” he continued. “It’s absolutely stupid. It’s indicative of a distributor on the verge of bankruptcy.” Management controls are in place at Hamilton/Avnet to prevent a rash of such transactions, See “TWO, Page 45



— Photo by Guy Delort

n of Advanced Micro Devices, reiterates to members of a he need for reform in trade and tax policy if the semi- light. Looking on is Gil Amelio, president of the Electron- ics Industries Association. See stories on pages 8 and 47.

Intel Phases Out DRAMs; Motorola Dropping 64K Units As Price Pressure Mounts

By LORING WIRBEL and ROBERT RISTELHUEBER

The shakeout in the dynamic memory business accelerated last week as Intel withdrew from the market entirely and Motorola acknowledged reports it would cease production of 64K dynamic RAMs.

The actions follow by one week Texas Instruments' establishment of a rock-bottom 90 cent distributor cost for 64K RAMs, indicating to some analysts that it may be close to making a

For Distributor Impact, See P. 62

similar decision. Street resale prices, in an environment of auction-buying which has prevailed since the summer, are currently running between 60 and 70 cents.

The pricing pressure in the general semiconductor memory market, which was reflected in Intel's second quarter as a \$23 million operating loss, was the first application of red ink since the company pioneered the technology in the early '70s with the famous 1103, a 1K dynamic RAM. Motorola, meanwhile, reported a quarterly operating loss of \$46 million (See stories on pages 65 and 67).

Intel has dramatically reduced its dynamic RAM activity in recent generations of the part, bringing the line below five per cent of its sales this year, but it had hoped to command high ASPs for its current package of CMOS 256K dynamic RAMs as niche products. Severe price erosion at every level of the dynamic memory business, however, stifled any premium for CMOS.

Intel's decision to withdraw from dynamic RAMs contrasts with its strategy in the EPROM market where it is also under seige, but where it has joined Advanced Micro Devices and National Semiconductor in a 301 petition against eight Japanese companies.

National had earlier tooled up to produce 64K RAMs under license from Micron Technology, but has since scuttled the

See INTEL, Page 4

BOCs to Make Gear in U.S.

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premises equipment after September 1, 1986, once the Secretary of Commerce submits a guarantee to Congress that each BOC is offering equal access to all long-distance carriers and information service providers, and that there is “no substantial possibility that any BOC could impede competition in the telecommunications and CPE manufacturing business.”

Language in the bill also leaves the door open “at any time as appropriate” for further

See BILL, Page 6

YNOTER Design Tools Termed Unable to Handle the Current Logic Load

By RICHARD WALLACE

Y. — Despite the explosive increase in the number of engineering workstations, current approaches to logic design in the face of escalating circuit design remain only “short-term fixes” that will be obsolete by the time they are deployed.

Assessment of the hurdles facing users and developers of design tools was offered here last week by the

System 12 Exec Resigns from ITT

NEW YORK — ITT vice-president Ivan A. Cermak resigned last week 7 months after being put in charge of a new division with responsibility for pushing the company's System 12 digital central office switch into the U.S. market.

Dr. Cermak left the com-

RCA QMOS—
75 HCT Types
Plus HC Types
Nationwide

I&Q Withdraw MOS Stake

Central Corp. and Hambrecht & Oster to buy Intermedics' 47 percent holding in a plan that would have made the standard cell specialist a subsidiary, which the investment bankers intend to acquire.

"Agreement from pursuing other negotiations," he said. "But we were being contacted by other possible investors throughout that period of time."

ZyMOS and Exel officials both said they planned to look for new financing packages. Intermedics officials did not return calls for comment, but Mr. Guzman said he knew of no immediate plans by Intermedics to dispose of its 47 percent share in ZyMOS.

DG Transferring 160 to Fed Systems

WESTBORO, Mass. — Data General Corp., in a move to improve sales to the federal government, last week said it is transferring about 160 employees, mostly sales and support personnel, from its North American sales operation to the 11-month-old Federal Systems division.

The move increases the division's workforce fivefold to more than 190 employees, and makes Federal Systems the only division with a dedicated sales force, a spokesman said.

The division remains headed by Larry H. Holswade, vice-president and general manager.

The sales personnel transferred to Federal Systems had reported to Frank Kaney, North American sales vice-president, the spokesman said.

The bulk of the sales, systems engineers and support staff transferring to the Federal Systems division will report to a new federal national sales manager position, which will be filled on an interim basis by Mr. Holswade, the spokesman said.

The spokesman said the move was long-planned for the division, and noted that most of those workers had been focusing on sales to the federal government.

The sales effort will include three regional offices and 11 branches. The company has named James Webster, Robert Mague and Alan Geller to head the division's eastern, central and western offices.

The Federal Systems division was formed late last year with the appointment of Mr. Holswade from Dataproducts Corp., where he was vice-president for government and military products (EN, Nov. 19, 1984). Its workforce had grown from 20 to about 40.

The firm's other divisions — Information Systems, Technical

LETTERS

Rockwell Retorts

Dear Sir:

I would like to take issue with a story in your "Antenna" column last Monday. Your column editor erroneously reported that "Rockwell Semiconductor has dropped out" as an alternate source for the 68000 MPU. There are two things your staff needs to consider and understand before writing a story such as this: First, there is a major difference between a second-source agreement and an irrevocable paid-up license and, second, there is a difference between the generic Motorola 16-bit family and the specific 68000 MPU.

Not only is Rockwell Semiconductor making the 68000 MPU, but sources tell us that Rockwell Semiconductor is the first supplier with a full mil temp range version of the product. Rockwell's mil temp version of the 68000 has been well-received in the market and is in full production.

I'm surprised to even see a story like this printed, it is more than year-old news. The Rockwell/Motorola second-source agreement on 16-bit product was a 5-year agreement that ended Aug. 10, 1984. Connecting a 16-bit family alternate-source story with the 32-bit family feud is quite a stretch. We never had an agreement with Motorola on the 32-bit line, so it would seem to follow that we couldn't have any friction over 32-bit mask sets either.

DANIEL K. RIME,
Semiconductor Products division,
Rockwell International Corp.,
4311 Jamboree Road,
P.O. Box C,
Newport Beach, Calif. 92660

Sperry Lays Off 70 Mfg. Employees

ROSEVILLE, Minn. — Sperry Corp. has laid off 70 employees at its Computer Systems division's manufacturing plant which produces its large 1100/60, 1100/70, 1100/80 and 1100/90 processors.

The company said it informed the workers of the layoffs early in October and that they were effective immediately at that time. The layoffs affected engineering support employees, primarily technicians and draftsmen.

The layoffs leave the plant with about 5,000 employees, Sperry said. The company attributed the layoffs to advancements in test and design automation and slow market conditions.

Products and Desktop — were not affected by the move, the spokesman said.

Separately, Data General named Charles M. Boesenberg to the post of vice-president and general manager for European operations.

Intel Phasing Out DRAMS; Motorola Dropping 64Ks

Continued From Page One

project. Micron, itself an early leader in the 64K dynamic RAM market, recently filed a civil suit against the Japanese suppliers charging predatory pricing. Inmos ceased dynamic RAM production last summer.

"We will stand and fight in EpROMs, and we intend to keep our static RAM technologies, but we could not recoup the necessary capital to justify keeping the dynamic RAM lines open any longer," said Carl Everett, Intel Memory Components division marketing manager.

Intel's departure from dynamic RAMs is a "definitive decision" that should be seen as permanent, Mr. Everett said.

Designs for the long-anticipated CMOS megabit dynamic RAM are now in limbo, he said, awaiting a decision by Intel to possibly license or sell the design.

No layoffs are anticipated due to the dynamic RAM pullout, as only some 75 employees remained dedicated to lines in Intel's Oregon operations. Mr. Everett said Intel would try and place all 75 employees in new slots within the company, with a first objective of keeping those employees in Oregon who want to stay there.

"This may help explain our strong showing on the 30th," Mr. Everett said, in reference to the 301 petition to the International Trade Commission. "EpROMs are really the last commodity battlefield left in memories."

Motorola, meanwhile, last week confirmed reports from distributors that the company is halting production of its 64K dynamic RAM. A company spokesman declined elaboration, however, and no officials of Motorola's Memory group would comment on the decision or on Motorola's future position in the dynamic memory business.

Motorola had viewed the 64K dynamic RAM as the anchor in its push into the MOS memory business in the late 1970s, but except for a brief 18-month period prior to this recession, the part has never provided adequate profitability.

The withdrawals by Motorola and Intel leave only Texas Instruments, Mostek and Micron Technology as volume commodity 64K RAM suppliers in the U.S. Texas Instruments, however, is a major questionmark in the 64K RAM business, considering its decision 2 weeks ago to refuse to quote distributor costs below 90 cents for the part.

Bruno Pagliuca, senior vice-president and director of marketing for Texas Instruments' Semiconductor group, said the company would continue to manufacture 64K dynamic RAMs, but acknowledged that if customers simply stopped buying in favor of lower-priced parts from competitors, TI would simply accelerate its transition to the 256K. That notwithstanding, Mr.

Pagliuca said the policy "is doing very well for us. Our 64K RAM sales have even gone up. It's just a blip and I don't know how long it will continue, but maybe some customers don't want to get caught with further price increases.

"The 64K is certainly in the declining phase," he continued, "but the bell-shaped curve has a long tail. We're still selling some 16K dynamic RAMs.

"Certainly, the 256K is taking away the major volume, but I don't think you'll see the 64K disappear overnight," Mr. Pagliuca added.

Mr. Pagliuca said he believed it was important to be a player in all phases of the memory business. "In the DRAM business you have to be in each product complexity to be effective. You have to have a commitment to the whole market."

Nonetheless, he said Motorola's move to pull out of the 64K dynamic RAM market didn't come as a surprise. "We've certainly been seeing them less active in that market," he noted.

Mostek Corp., another volume 64K RAM supplier, declined comment on Motorola's decision or its possible repercussions on the market.

More than most semiconductor companies, however, Mostek has been stung by the year-long decline in demand for the 64K RAM, and by the rapid drop in prices for the parts. The company lost \$215 million in the first half of 1985 as sales slumped and prices fell from about \$4 last fall to less than a dollar.

Mostek was hit with a cancellation of millions of dollars in orders of 64K RAMs by the end of last year (EN, Jan. 14). The company subsequently had to write down its inventories to the tune of \$99 million during the first half of this year.

The collapse of dynamic RAM pricing and demand resulted in the sacking of Mostek president Hal L. Ergott last May, the layoffs of over half Mostek's employees, and the recent recruitment of Motorola executive Jim Fiebigler as president.

Speculation persists that United Technologies will sell or shut Mostek rather than continue to absorb heavy losses at the subsidiary.

UTC to Close Mostek, Sell Communications Unit

By Michael Schrage
Washington Post Staff Writer

United Technologies Corp. will close its money-losing Mostek semiconductor subsidiary and sell its telecommunications business, resulting in after-tax loss provisions of \$423.7 million, the technology conglomerate announced yesterday.

The loss provisions were offset in part by the sale of another subsidiary, and the company showed a net loss of \$45.6 million for the third quarter compared with a profit of \$192.7 million (\$1.48 a share) for the third quarter of last year. Its 1984 revenue totaled \$14 billion.

"Satisfactory results from our core businesses during the first nine months were overshadowed by losses in Mostek and our telecommunications business. The actions we are taking are difficult and unpleasant, but absolutely essential to end the drain on our earnings," said United Technologies Chairman Harry J. Gray.

These moves effectively end United Technologies' efforts to become a major player in the silicon chip and telecommunications markets, efforts that Gray had initiated in an attempt to make his company a major force in electronics.

"This is a painful recognition of reality that the company's efforts in electronics have not worked and that, therefore, the future health of the enterprise would be impaired if they continued investing at past

rates," said Wolfgang Demisch, an analyst with First Boston. "It's a major setback for the company."

Mostek, which UTC acquired in 1980 for \$345 million, was intended to be the company's gateway into the electronics age. Mostek offered a base for UTC to build electronic intelligence into its other products.

Instead, the acquisition coincided with a slump in the semiconductor business from which Mostek was unable to recover in the face of rapidly changing technology and increasing competition from Japanese semiconductor companies.

According to Dataquest, Mostek's revenues for the first half of 1985 dropped nearly 50 percent to \$94 million. The company wrote down nearly \$214 million in inventory and had slashed its employment rolls from 10,000 to well under 3,000. The company was losing an estimated \$200 million a year.

UTC had hired Motorola semiconductor executive James Fiebiger to run Mostek, but he reportedly told UTC management that the company was beyond repair. Fiebiger, who was unavailable for comment, will remain with UTC in a "senior management position," according to a company spokesman.

The company also said it would sell its unprofitable United Technologies Communications group, which it had acquired from General Dynamics Corp. in 1982, as part of its divestment efforts. The move will affect 1,400 people.

Japan can't produce crude oil and the other natural resources its export machine feeds on. But it can achieve independence in silicon wafers—and price be damned.

Suicide in silicon?

By Kathleen K. Wiegner

"... in the histories of heroism which one sees on the Japanese stage, cunning and sudden attack are raised to an equal glory with suicide. Whether one kills or dies, the facts and the terms are equally unimportant."

—Paul-Louis Couchoud,
Japanese Impressions,
1904, on the outbreak of
the Russo-Japanese War

AS IN WAR, so in business, the Japanese are willing to pay a high price for the glory and excitement of the at-

tack. In the 1970s, Japan's Ministry of International Trade and Industry herded Japanese firms into an all-out, near-kamikaze attack on the semiconductor industry. It succeeded, but at a terrible cost. Today the Japanese dominate the memory chip segment of the market—but at a cost of excessive investment that has decimated producers' margins everywhere, including in Japan.

Now the powerful MITI has a new target in sight—the silicon wafer, the semiconductor's basic building block. At the very time when Prime Minister Nakasone is solemnly promising

to open Japan's market and buy more from its partners, MITI is prodding some of the country's largest corporations to begin producing the shiny round wafers on which the semiconductor makers etch their circuits.

Margins in wafers, too, will likely crumble. But no matter. A wave of big Japanese companies has already answered MITI's call.

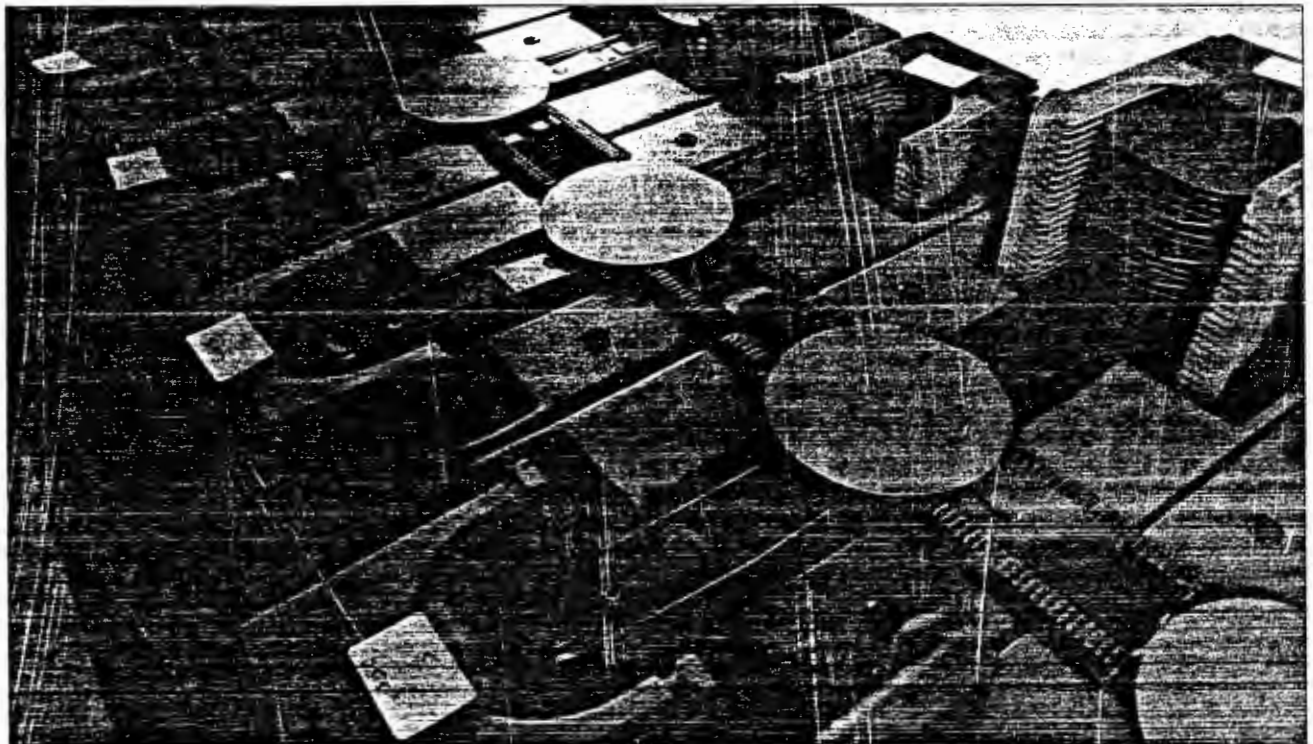
Item: In June, Nippon Steel, the world's largest steelmaker, announced a joint venture with Hitachi to begin producing enough silicon wafers to satisfy 5% of worldwide demand, with production to begin by 1987. Hitachi is the company whose aggressive pricing did much to ruin U.S. microchip producers' margins.

Item: Also in June, Nippon Kokan K.K., Japan's second-largest steel company, agreed to acquire General Electric's technology for making polycrystalline silicon, the raw material silicon wafers are made of.

Item: Again in June, Kawasaki Steel Corp. (sales: \$5 billion) acquired privately owned NBK Corp., a Santa Clara, Calif. maker of silicon wafers.

Item: In July, Toyo Soda Manufacturing, a petrochemical supplier, signed a letter of intent with Menlo Park, Calif.'s Siltec Corp. to form a joint venture to make silicon wafers in Japan.

"To utilize our existing production resources more effectively, it is neces-



Automatic sorting of silicon wafers at Monsanto's St. Peters, Mo. plant
Despite Japanese promises to open home markets, new moves to protect them.



From sand to silicon
Pure silicon ingots (above) are pulled from molten polysilicon, then turned into wafers (left).

sary to move to more technology-intensive, higher-value-added areas," explains Shigeyoshi Horie, head of Nippon Kokan's effort to swing his company into nonsteel businesses. "One of those areas is semiconductor-grade polysilicon."

Is the world so short of silicon wafer capacity that all this new MITI-induced investment is necessary? Hardly. The silicon wafer business, currently around \$1.5 billion a year in producers' sales, is expected to grow to \$3 billion by 1990. Three companies now dominate the market: Monsanto, West Germany's \$980 million (sales) Wacker-Chemie, and Japan's \$800 million (sales) Shin-Etsu Chemical. These three together account for about 80% of world sales of silicon wafers. They and the other 15-odd existing producers can certainly handle the 17% annual demand growth anticipated for wafers.

The Japanese market is already locked up by Japanese producers, led by Shin-Etsu, Osaka Titanium, Nippon Silicon (owned by Mitsubishi) and Komatsu Electronic Metals. Japanese companies supply over 90% of

Japanese semiconductor makers' current wafer demand, says Daniel Rose, publisher of Los Altos, Calif.-based *Electronic Materials Report*.

It is clear, then, that the new Japanese push is inspired not by visions of an untapped market but by a national decision that Japan ought to try dominating this already well-established market. Listen to Haskell Waddle, vice president of commercial operations at Monsanto Electronic Materials, which produces an estimated \$200 million to \$300 million in wafers annually, and whose U.S. market share has already been under attack from Japanese suppliers: "We regard all these recent announcements as moves to protect their [silicon] industry." Waddle has good reason to fume. Monsanto is building a \$100 million wafer plant in Japan to improve its under-2% market share there. He needs the extra local competition like he needs a hole in the head.

It is very clear that, for all their protestations about wanting to open their markets, the Japanese continue to pursue national goals that conflict with the idea of free trade. MITI's

technocrats, like many Japanese, will probably never forget the chaos following Franklin Roosevelt's embargo on oil shipments to Japan in 1941. At the back of their minds must gnaw a fear that an embargo of raw materials for its information industries might have a similar effect, especially if silicon wafer demand should grow faster than domestic wafer producers' ability to meet it. In that event, Japanese semiconductor producers might be forced to rely on foreign suppliers. Thus the determination to achieve dominance of the market, regardless of cost.

As semiconductor sales boomed in 1984, Japanese chipmakers were obliged to turn to outside suppliers for some of their wafer needs. That really put the wind up among Japanese planners. Japan can't manufacture crude oil and the other natural resources on which its export machine feeds. But it can achieve silicon wafer independence. MITI obviously believes crumbling margins and a few bankruptcies are a small price to pay for wafer independence—especially if there is a chance to dump the excess capacity into someone else's market.

What about the raw materials to make the wafers, particularly the polysilicon used to grow silicon ingots that are sliced into wafers? At present, Japanese wafer companies import anywhere from 45% to 50% of the polysilicon they use from such suppliers as Dow Corning and Wacker-Chemie. Polysilicon dependence makes MITI all the more paranoid, and helps explain Nippon Kokan's announced entry into polysilicon production.

Overinvestment and some bankruptcies in polysilicon, as in silicon wafers, are likely. But as M. Couchoud noted 80 years ago, what matters to the Japanese is not so much whether you suffer but the depth of your patriotic zeal. Prime Minister Nakasone talks of "market opening" proposals. But in his bureaucracy a Japan-first policy still rules. ■

Electronics

WHAT'S BUGGING DEC'S MICROVAX II? A MEMORY CHIP

SHIPMENTS OF WORK STATION RESUME AFTER 256-K DRAM IS REPLACED

MAYNARD, MASS.

The bug that forced Digital Equipment Corp. to suspend shipments of Unix-equipped versions of its Microvax II work station last June has been traced to a component failure—not the Unix operating system, as had been previously reported. DEC says it has replaced the part and resumed shipments of the Microvax. The computer maker would not disclose which component failed or name the supplier; but according to industry sources, the culprit was a 256-K dynamic random-access memory from NEC Corp. of Japan.

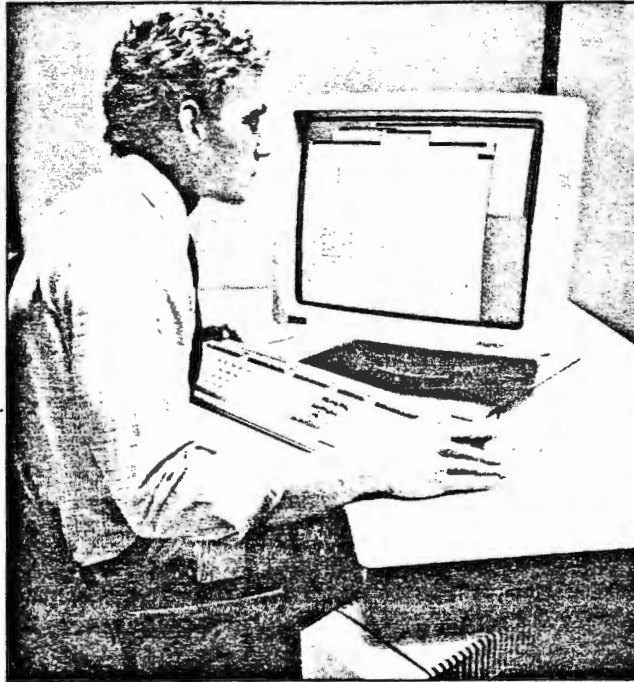
The failure reportedly occurs after the memory chip goes 45 to 60 seconds without being written to. The next write then makes a change in the column adjacent to the one being written in. The cause of the problem is still unknown.

DEC's Ultrix-32m, a version of Unix 4.2bsd with System V compatibility, was at first thought to be at fault because the failure occurred when the Microvax II was running under that operating system, but did not occur under the VMS operating system. However, VMS in effect masked the error because it regularly writes to all memory chips as part of normal operation.

An executive in DEC's corporate communications office would not confirm these details. DEC did, however, confirm that the problem was in hardware.

SUBTLE SENSITIVITY. "The problem created an error under a rare combination of operating conditions," a DEC statement said. "The problem was isolated to a subtle sensitivity in a non-Digital component for which the company has multiple sources. Alternate-source components not subject to this sensitivity will be used in future Microvax II systems. We expect no interruption in our business from customers who are looking to VAX for their Unix needs."

All backlog shipments of the Microvax II will be made by the end of the month, DEC added. Systems already in customers' hands would be fixed by a component swap. Asked whether the



SHIPPING. Held up by a hardware bug, DEC's Microvax II is again being shipped with the Ultrix operating system.

Scottsdale, Ariz., engineering and research firm, estimates that NEC shipped 9.4 million units last year and has been steadily ramping up this year. June 1985 shipments were estimated at 4 million; both NEC and Hitachi expect to be shipping 10 million units a month by December, ICE said in its midyear status report on the industry.

The NEC chip uses n-MOS technology and 1.3- μ m design rules, and has an access time of 150 or 200 ns. Most of its 256-K parts are made in Japan, though some are being fabricated in the company's new Roseville, Calif., facility.

A source within DEC said that the company was so concerned about its commitment to Ultrix that it had some 30 senior engineers—from manufacturing, both Ultrix and VMS teams, Microvax system engineering, and memory engineering—working to uncover the bug. Early this month, the source said, the failure was duplicated on Siemens test equipment, and the results communicated to other projects within DEC.

component was indeed the NEC 256-K DRAM, DEC declined to answer.

In Tokyo, NEC said it had no knowledge of the DEC incident and would have no comment on possible problems with its 256-K DRAM. NEC's U.S. headquarters in Mountain View, Calif., also declined comment.

NEC has been shipping 256-K DRAMs since the first quarter of 1984, and it is ranked as one of the two largest suppliers of the part. Hitachi Ltd. is the other. Integrated Circuit Engineering Corp., a

APPENDIX B

CHRONOLOGY OF EVENTS LEADING
TO FILING OF THE SIA SECTION 301
PETITION

CHRONOLOGY OF EVENTS

Leading to Filing of

SIA Section 301 Petition

- 1957 Invention of the integrated circuit
- Japan enacts first law for the promotion of the electronics industry; limits imports and direct foreign investment in electronics.
- 1962 Motorola, Inc. establishes sales subsidiary in Japan.
- 1967 U.S. and Japan begin staged semiconductor tariff reductions as part of GATT Kennedy Round agreement. The U.S. reduces its tariff more rapidly than Japan.
- 1968 Texas Instruments establishes joint venture to manufacture semiconductors in Japan. In exchange for government permission to make this investment, TI agrees to sell no more than 10% of all semiconductors sold in Japan and grants Japanese companies licenses on several semiconductor patents.
- MITI begins to limit number of Japanese semiconductor companies.
- 1970 Japan ends quotas on semiconductors of fewer than 100 elements (the least sophisticated products).
- 1971 Public Law 17, Law for Provisional Measures to Promote Specified Electronic and Machinery Industries enacted in Japan. This law provides for the promotion of the Japanese electronics industry, and maintains quotas on Japanese semiconductor imports.
- Telecommunications and computers also protected by similar means. Formal trade barriers on consumer electronics begin to be reduced in Japan, but replaced by non-tariff barriers.
- U.S. pressure associated with Okinawa reversion results in Government of Japan commitment to liberalize imports of integrated circuits. MITI opposes measures.

- MITI's LSI Computer Project initiated
- TI buys 100% interest in its Japanese manufacturing subsidiary.
- 1971-72 MITI promotes horizontal ties between Japanese semiconductor producers in R&D projects intended to avoid the duplication of production effort and to encourage a division of labor among companies.
- MITI promotes formation of a formal semiconductor cartel in Japan. The Electronics Industries Association of Japan (EIAJ) supports this proposal.
- 1972 Japanese semiconductor industry seeks 7 billion yen in subsidies from Japanese Government to counteract elimination of formal trade barriers.
- 1973 Timetable for liberalization of integrated circuit imports is accelerated as a result of threat of a U.S. GATT complaint.
- MITI begins expedited industry reorganization program, encouraging device specialization and horizontal tie-ups as "liberalization countermeasures."
- 1973-1975 Japan's quotas eliminated on imports of integrated circuits of fewer than 200 elements. MITI opposes measure.
- Other U.S. semiconductor companies open Japanese sales subsidiaries.
- Additional MITI-subsidized semiconductor projects initiated.
- 1974 Imports of non-computer integrated circuits of greater than 200 elements liberalized. Quotas eliminated; direct foreign investment permitted.
- EIAJ petitions MITI for subsidies and encouragement (or administrative guidance) to "Buy Japanese" to offset semiconductor liberalization.
- 1975 Imports of integrated circuits for computers liberalized. Quotas eliminated. Direct foreign investment permitted. MITI gives administrative guidance to Japanese computer companies to "buy national products" as a liberalization countermeasure.
- 1975-1979 MITI and NTT initiate VLSI R&D projects for inte-

- grated circuits.
- 1977 CB radio boom leads to temporary increase in U.S. companies' semiconductor sales in Japan.
- SIA formed, largely to address problems of access to Japanese semiconductor market and dumping of Japanese semiconductors in the U.S. market.
- 1978 Japanese Diet passes Public Law 84, Law for Provisional Measures for the Promotion of Designated Machine and Information Industries. This law, in effect through 1985, explicitly exempts the semiconductor industry from Japan's antitrust laws, provides for special low-interest loans to Japanese semiconductor companies, and authorizes MITI to take steps to "elevate" and "rationalize" the Japanese semiconductor industry.
- U.S. companies' sales in Japan fall as CB radio boom ends.
- 1979 Video game boom leads to temporary increase in U.S. companies' semiconductor sales in Japan.
- U.S. firms' 8080 microprocessor sales abruptly disappear as Japanese products come on stream.
- 1980 Japanese companies are accused by U.S. producers of dumping semiconductors in the U.S. market.
- U.S. sales in Japan fall as video games boom ends.
- 1981 SIA and other high technology trade associations meet with Ambassador William Brock, United States Trade Representative, to discuss high technology trade problems including problems with access to the Japanese market.
- Tokyo Round staged GATT tariff reductions begin with semiconductor tariff reduction in U.S. and Japan staged to 4.2% by 1987.
- Motorola purchases 50% share in Japanese semiconductor manufacturing venture.
- U.S. firms' sales of bipolar PROMs virtually disappear as competing Japanese product comes on stream.
- 1982 U.S. and Japan in bilateral agreement each reduce semiconductor tariff to 4.2% through acceleration

of GATT tariff reductions.

U.S.-Japan High Technology Working Group (HTWG) formed to discuss issues in trade in high technology products. Semiconductors are selected as first sector for examination.

Motorola acquires 100% ownership of its Japanese manufacturing venture.

1983

HTWG concludes the High Technology Agreement to promote free bilateral trade in high technology products between the U.S. and Japan.

Later the HTWG agrees on a set of Semiconductor Recommendations. These Recommendations include a commitment from the Government of Japan to encourage increased imports of semiconductors by Japanese companies.

1984

In first half of the year, U.S. companies' market share in Japan increases after Japanese Government encourages purchases of foreign semiconductors and because Japanese companies are unable to fill all orders placed by Japanese semiconductor users.

In accordance with the Semiconductor Recommendations, SIA members place sales in Japan in their highest category of priority.

Later in year, Government of Japan ceases to encourage use of foreign semiconductors and as market softens U.S. companies' market share begins to decline.

MITI launches massive new high technology promotion effort, featuring tax benefits, new generation R&D projects, and creation of a government-funded "High Tech Trust Fund" to provide interest-free and low interest loans for high tech R&D.

Japanese semiconductor companies report plans for new capacity which far exceed expected rates of world semiconductor market growth.

1985

U.S. and Japanese semiconductor tariffs eliminated through bilateral agreement.

U.S. firms report deep price cuts by Japanese producers. Hitachi encourages distributors to keep undercutting U.S. firms' prices until a sale

is made while guaranteeing a 25% distributor profit.

U.S. companies announce widespread layoffs, plant shut-downs, and operating losses.

SIA files Section 301 trade case to achieve full participation for U.S. semiconductor companies in the Japanese market.

APPENDIX C

CONTEMPORARY JAPANESE PRESS REPORTS
OF SEMICONDUCTOR LIBERALIZATION
COUNTERMEASURES

CONTEMPORARY JAPANESE PRESS REPORTS OF
SEMICONDUCTOR/COMPUTER LIBERALIZATION AND
COUNTER-LIBERALIZATION MEASURES
(FULL TEXTS PROVIDED TO USTR)

March 1, 1973

U.S. Presidential Special Representative for Trade Negotiations, EBERLE, who came to Japan recently, notified our country that if it does not decide to liberalize electronic computers and IC's, the United States will lodge an appeal with GATT If the appeal is made, our country will inevitably be driven into a tight spot,

According to the Government source's outlook, it is inevitable that our country, which is isolated with a marked surplus, will be beaten if the appeal is made to GATT,

March 8, 1973

MITI Minister NAKASONE announced on the 7th a statement to the effect that, "promotion of further tieup than the present three groups will be necessary," with regard to the problem of import liberalization of electronic computers in our country competing with one another in disorder is improper to meet liberalization.

The gist of the MITI Minister's statement that day is as follows: (1) We are now carefully checking into the time of liberalization and counter-policies for it; (2) further tieup among the three groups will be promoted; and (3) there can be no case of any of the groups withdrawing,

March 15, 1973

. . . MITI revealed on the 14th that it has begun checking into concrete problems, with a determination to start efforts for reorganization of the IC manufacturing enterprises as part of the countermeasures against liberalization. . . . MITI's plan is to have the fields of production adjusted among these firms so that each firm can specialize in a specific production field, for establishment of a division of labor.

. . . (3) Japan must foster IC [integrated circuit] manufacturing enterprises at home, because the IC is to become the foundation for the electronic industry.

. . . MITI will divide IC manufacturing firms into several groups to specialize in the respective fields of production, such as bi-polar machines and metal oxide semiconductors

(MOS), so that a division of labor will be established among them MITI is planning to subsidize the efforts for establishment of such a production structure, as part of its countermeasures against liberalization.

March 27, 1973

. . . it has become clear that the US side is demanding still stricter liberalization by our country's industrial circles concerned. MITI is racking its brains in an attempt to formulate countermeasures.

June 15, 1973

MITI Minister NAKASONE will report to the Cabinet meeting on the 15th that "imports of electronic computers will be liberalized during 1975" and will obtain Cabinet approval After the Cabinet meeting on the 15th, the Government will convey this decision to the U.S. Government, through the U.S. Embassy in Japan, on the one hand, while on the other, it intends to give guidance to the industry circles concerned, for the promotion of the consolidation of their structure, with an eye to liberalization in 1975.

. . . MITI Minister NAKASONE touched upon the liberalization of the imports of electronic computers, and said: "With the deciding of the liberalization of electronic computers, the biggest pending question in the trade field between the U.S. and Japan has been removed, and pressure against Japan will probably lessen." . . .

. . . our deciding on the liberalization of electronic computers and IC's has removed the biggest pending problem in U.S.-Japan trade. With this, U.S. pressure . . . against Japan will probably lessen.

June 15, 1973

. . . MITI will divide IC into several groups such as MOS, etc. Each company will become an expert of certain areas and divide the labor. Because of this, each area will have effective development as well as technology improvement. MITI intends to issue aid for liberalization countermeasures

November 5, 1973

. . . the Government will take care of almost half of finances for facilities for mass-production of new products

which have big risk. It is just like a dream story for a fallen industry.

January 24, 1974

Electronic Computer Industry Circles Heading toward Further Reorganization to Build Setup to Intercept IBM, in Preparation for Impending Liberalization: Cooperation in Sales Field Their Task

Three groups, consisting of six domestic computer manufacturing companies, have begun to move toward strengthening their respective intra-group cooperation These groups firmly established cooperation formulas in the fields of production and sales,

March 20, 1974

In allocating the subsidy this time, MITI put stress mostly on joint development by groups of manufacturing companies. MITI expects that groups of companies engaging in joint development will maintain their co-operative structure in other fields henceforth without sticking to those kinds of items, which became the objects of a subsidy.

. . . . It is viewed that domestic IC industry circles, which were thrown into confusion, will consolidate their structure step by step in an attempt to complete their counter-attack structure before the liberalization.

December 12, 1974

. . . . MITI gave administrative guidance, putting these things on the negative list This meant that since MITI put up the negative list and gave administrative guidance, it was possible for us for the first time to stand on our own feet.

December 21, 1974

"Request To the Government as a Result of the Liberalization of IC Imports, and for Continued Capital Assistance"

. . . . it is necessary to deepen the interrelationships with these industries and enlarge the use of Japan-made products. Appropriate guidance that will assist both sides of production and demand is requested, because it is important that the demand for national products be enlarged In addition, it is desired that the Government provide guidance and assistance because it is important that the government and civilian sectors work together in proposing legislation

and for executing these various measures to strengthen the IC industry, to promote its healthy growth, by attention to the flow of imports, and taking appropriate measures.

December 1, 1975

. . . MITI has fixed the date for complete liberalization of product imports, at December 23 . . . domestic manufacturers say that "Our set-up for interception has been completed."

March 1, 1976

MITI Minister Sends "Buy Japanese Computers" Request Letters to Public Sector, Utilities and Banks

". . . if a Japanese model is on an equal level as a foreign model, the Japanese model should be selected." The letter was sent to various organizations, educational institutions, banking organs and local public institutions.

APPENDIX D

EXECUTIVE SUMMARY FROM QUICK FINAN
ASSOCIATES STUDY, "AN ANALYSIS
OF THE EFFECTS OF TARGETING ON
THE COMPETITIVENESS OF THE U.S.
SEMICONDUCTOR INDUSTRY

AN ANALYSIS OF THE EFFECTS OF TARGETING
ON THE COMPETITIVENESS
OF THE U.S. SEMICONDUCTOR INDUSTRY

A Study Prepared for the Office
of the United States
Special Trade Representative, the Department
of Commerce and the Department of Labor

May 30, 1985

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Executive Summary[*]

1. "Targeting" practices cover any governmental or officially sanctioned policy or plan, domestic or foreign, that as a stated purpose seeks to enhance or as a foreseeable result will enhance the competitiveness of a particular industry or industries relative to other industries in the domestic and/or export market.
(Chapter III)

2. Targeting practices, for the purposes of this study, were divided into five categories: (1) home market protection; (2) tax benefits; (3) antitrust exemptions; (4) science and technology assistance, and (5) financial assistance (Chapter III).

3. There are generally several conditions which must be present for government targeting to be effective, including an efficiently operated and managed industry with a strong underlying position in semiconductor technology. (Chapter I)

[*The section of the study dealing with the summarized item is given in parentheses.]

4. The segment of semiconductor technology most extensively targeted (called MOS integrated circuits) is a \$12 billion worldwide market today; it grew at an average annual compound rate of 27 percent over the past five years. By 1990, this market could double in size.

Chapter II)

The U.S. market represents 47 percent of integrated circuit (IC) consumption, Japan 30 percent, Europe 17 percent, Rest-of-World (ROW) 6 percent. (Chapter II)

In 1984, Japanese firms have 16 percent of the U.S. IC market, and in a major subcategory, 28 percent of the U.S. total memory market. In Japan, U.S. firms have a 14 percent share of the Japanese market and 9 percent share of the memory market. (Chapter II)

5. Summary of major trends in targeting practices with respect to semiconductors:

-- There has been some increase in the overall use of targeting practices vis-a-vis the semiconductor industry over the past 15 years, primarily due to the increased use of assists for semiconductor R&D.

(Chapter III.2)

-- Through the 1970s Japan was the country with the most intense, broad-based efforts relative to the semiconductor sector. Around 1980, overall Japanese government support for its semiconductor sector began to decline. (Chapter III.2)

-- European countries and the European Community account for most of the recent rise in overall targeting activity relative to the 1970s. (Chapter III.2)

-- The U.S. Department of Defense has in two periods (1955 to 1965, and 1974 to present) provided R&D assists to the U.S. semiconductor industry. (Chapter III.2)

6. Because of Japanese restrictions on direct investment, the U.S. share of the Japanese market in the 1960s and 1970s likely was about half of what it would have been had American firms been able in that period to establish marketing and production facilities in Japan. This estimate is independent of the estimates for the effects on the share in the U.S. market of other Japanese targeting programs. (Chapter V.2)

7. In the U.S. market, the estimated range for loss of market share by U.S. semiconductor firms due to the combined effects of all Japanese targeting programs (except past restrictions on investment) ranges between 9 to 24 market share points or between 18 to 49 percent of the Japanese market position. This estimate is made for the targeting practices related to home market protection, tax benefits, antitrust exemption, financial and scientific/technical assists. Because available information on Japanese targeting programs is incomplete in its description of programs and the magnitude of resources involved, it is difficult to precisely quantify the economic benefits associated with several of these practices; therefore, this estimate must be viewed as illustrative of the possible order of magnitude and is not directly developed from analyzing specific Japanese government targeting practices.

The range of estimates for possible change in market position represents an estimated cumulative loss of sales between 1977-84 of about \$300 million to \$750 million and a reduction in employment in the U.S. industry of between 6 to 14 percent. (Chapter V.2)

8. If measured by market share, the European targeting programs of the 1970s and early 1980s would have to be judged to be fairly ineffectual. This is due, in part, to their firms' failure to stay abreast of current technology and the presence of a significant marketing and manufacturing infrastructure built-up in Europe by American firms. (Chapter V.3)

9. Taiwan and Korea have established complex policies and programs to assist their indigenous semiconductor industries. To date, these programs have had little measureable affect on the U.S. industry in the U.S. market. (Chapter V.4)

APPENDIX E

**EXTRACTS FROM NOMURA RESEARCH
INSTITUTE STUDY**

APPENDIX

Extracts From Nomura Research Institute Study
Of Semiconductor Market Size



NOMURA
Research

**INTERNATIONAL
TECHNOLOGY
RESEARCH SERVICE**

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JULY 10, 1985

WORLDWIDE SEMICONDUCTOR REVIEW

AN OVERVIEW OF COMPETITION



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The information and the opinion expressed herein constitutes or is to be construed as an offer or the solicitation of an offer to sell or buy the securities referred to herein. The information contained herein is based on sources which we believe to be reliable but we do not represent that it is accurate or complete. We may have a position in these securities and may make purchases from and/or sales to customers on a principal basis.

The worldwide semiconductor market was \$26.0 billion in 1984 according to statistics prepared by the Semiconductor Industry Association, up 46.1% from 1983. The Japanese market (including internal consumption by local producers) was 31% of the world market while the U.S. accounted for 45% (excluding large captives like IBM, GM, and Western Electric). (See Table 4). By product line, integrated circuits (ICs) were 79% of the world market and discretets were 21%. IC's were 83.3% of the market in the US, 76.9% in Japan, and 75.7% in Europe. Discretets were 16.7% of the market in the U.S., 23.1% in Japan, and 24.3% in Europe.

While the SIA publishes data by market consumption as shown in Tables 4 thru 6, actual production data by source is harder to obtain. In Japan MITI collects data on a production basis and we have presented this data in Tables 7 and 8. The difference between production and sales in Japan is primarily captive usage, which is about 25% of total production. The fraction of production used inhouse at the large integrated companies is probably greater. Exports from Japan in 1984 were 39.4% of total production up from 28.3% in 1979. Figure 1 shows estimated production worldwide by source as compiled by Hitachi. From MITI data, we know that Japanese production accounted for \$10.3 billion in 1984 or about 40% of the world market. U.S. and Europe based producers, therefore, were about 60%. U.S. based producers served about 53% of the world market according to our estimates but that was down from around 60% in 1982. If present trends continue U.S. and Japanese producers will achieve parity perhaps by the end of the decade.

Japan enjoys a substantial trade surplus in solid state devices with the U.S.. In 1984, IC exports to the U.S. grew 102% while imports grew only 52% creating a positive trade balance of \$834 million, almost triple the level of 1983. Japan has enjoyed a trade surplus in ICs with the US since 1980 and with world markets as a whole since 1979. Most of the trading surplus is comprised of high density memory chips sold to the U.S.

One trend that could alter the pattern of market share gains by Japanese producers is the increasing fraction of production in the U.S. accounted for by captives. Western Electric for example has over a billion dollars in internal semiconductor sales which would clearly put it among the top 10 among producers. The largest end markets in computers and telecommunications will continue to be in the U.S. and this could mean a shrinkage of available markets to merchants.

Figure 2. shows a comparison of Japanese and US end use markets for semiconductors in 1984. Some differences:

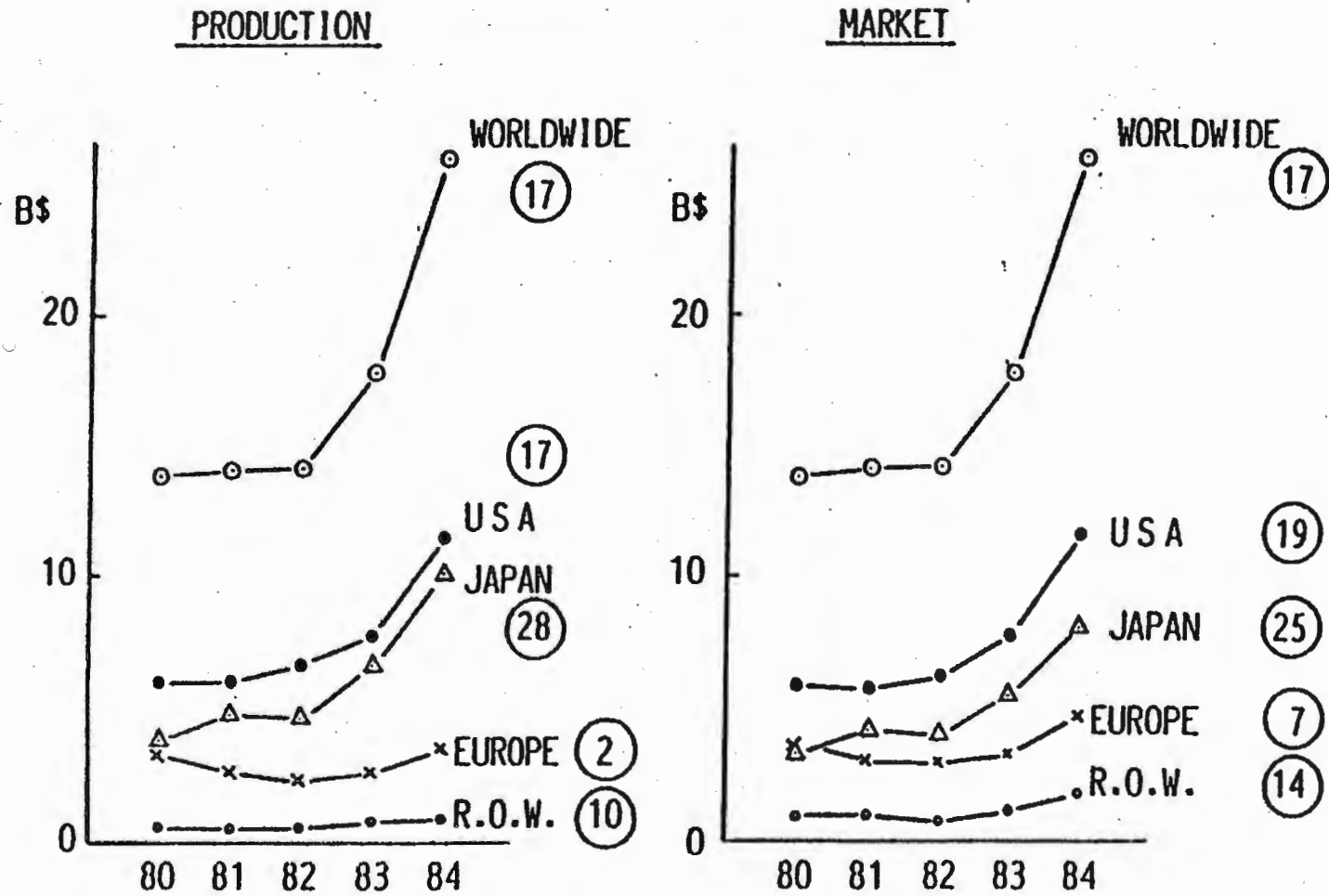
1. Computer markets account for 26% of the total in the US vs. 11.3% in Japan.
2. There is no military market in Japan but sales to this market absorb 13.9% of semis in the U.S.
3. Consumer markets are 41% of the Japanese market compared to 7.6% in the U.S.

Table 9 shows an estimate of European semiconductor consumption by end use markets. Comparing against U.S. and Japanese markets shows:

1. Telecommunications is the largest market segment and at 25% of total is much bigger than in either the U.S. or Japan.
2. Like Japan, the consumer market at 20% of total is a more important market for semiconductors in Europe.
3. The computer market for semiconductors at 19% is much smaller than in either the U.S. or Japan.

Figure 1

WORLDWIDE SEMICONDUCTOR PRODUCTION/MARKET



(REMARK) U.S.: CAPTIVE EXCLUDED
 (SOURCE) HITACHI, LTD.

○ : 80-84 CAGR(%)

Table 4
Worldwide Semiconductor Markets (Consumption)

(Dollars in Millions)

	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985E</u>
U.S.	\$6,259	\$7,763	\$11,599	\$8,865
W. Europe	2,998	3,319	4,738	4,870
Japan	3,985	5,534	8,034	7,850
ROW	822	1,151	1,586	1,320
Total	\$14,064	\$17,767	\$25,957	\$22,905

Source: Semiconductor Industry Association
 ROW: Rest of World

Table 5
Share of Market

	<u>1982</u>			<u>1984</u>		
	<u>U.S. Market</u>	<u>Japan Market</u>	<u>World Market</u>	<u>U.S. Market</u>	<u>Japan Market</u>	<u>World Market</u>
US & Europe Based Suppliers	89.7%	9.9%	64.9%	86%	10%	62%
Japan Based Suppliers	10.3%	90.1%	35.1%	14%	90%	38%

Source: Semiconductor Industry Association and Nomura Estimates.

APPENDIX F

EXCERPTS FROM THE U.S. GOVERNMENT
SEMICONDUCTOR SECTOR ANALYSIS STUDY
ON JAPANESE GOVERNMENT FINANCIAL
AID TO THE SEMICONDUCTOR INDUSTRY

IV. U.S. AND JAPANESE GOVERNMENT POLICIES: EFFECTS ON TRADE AND INVESTMENT

A. JAPANESE INDUSTRIAL POLICY

Japanese government support to the semiconductor industry is evident in:

- legislation
- elevation plans
- financial assistance
- government support to R&D
- import protection
- competition policy

1. LEGISLATION--MITI is charged under law with the promotion and direction of the semiconductor industry:

- o Public Law No. 171 (1957)
 - authorized MITI to exempt computer/semiconductor firms from antitrust prosecution;
 - provided financial assistance.
- o Public Law No. 17 (1971-78)
 - authorized MITI to adopt rationalization plans for the industry
 - authorized MITI to instruct firms to take concerted action exempted from antitrust prosecution
 - provided financial assistance.
- o Public Law No. 84 (1978-85)
 - requires that MITI prepare "Elevation Plans" for the semiconductor industry
 - instructs MITI "to procure" the necessary funds set forth in the Elevation Plan
 - authorizes MITI to "direct" firms to "practice concerted acts with respect to restrictions on standards and technology, and utilization of production facilities"
 - instructs the government to "take necessary taxation measures" for end-user industries to increase sales
 - provides specific penalties (Y100,000-500,000) for non-compliance.

11. ELEVATION PLANS -- Elevation plans for the semiconductor industry established pursuant to PL84 specify production levels, spending and technology objectives.

- o Elevation plans earmarked Y400 million for development of hybrid semiconductors, Y1.2 billion for silicon semiconductors, and Y9.2 billion for additional specific integrated circuits.
- o Magnetic Bubble Memory Devices -- 1984 production target of 5,000 memory devices with bubble diameter of 1.5 micromillimeters or smaller. Expenditure of Y 18 billion.
- o Chemical Compound Semiconductor Elements -- 1984 production targets: 1.2 billion yellow and green luminescent elements; 500,000 field effect type elements for microwaves; 300,000 elements for lasers; 30,000 wafers. Establishment of 900 units for manufacturing and assembly of components. Expenditure of Y 10 billion. Technology targets: large cross section, high grade crystal growing; multilayer, epitaxial growing; impurities diffusion; wiring, etching; monitoring overseas technology.
- o Semiconductor IC's -- 1984 production target of 4 million MOS; 3 million bipolar. Establishment of 80 units for manufacturing/assembly; 130 test/inspection facilities. Expenditure of Y25 million. Technology targets: high precision, high density pattern designing; controlling the depth of diffusion; decrease of threshold voltage; acceleration of production automation, including chemical deposits, diffusion, and epitaxial growth; continuous processing; development of equipment for high density pattern manufacturing; high-precision mass manufacturing, high speed assembly facility, high speed test facility, monitoring overseas technology.
- o Liquid Crystal Display Cells -- 1984 production target. 2 million dot matrix type. Establishment of additional manufacturing/assembly facilities; 50 test/inspection units; 30 air/water purifying units. Expenditures Y2 billion. Technology targets: high precision micro-pattern-forming technology, technologies for arraying, coupling, connecting; monitoring overseas technology.
- o Chemical Compound Semiconductor Materials -- 1984 production target 2,000 Kg (gallium, phosphorous);

- o Electronic Digital Computers -- Semiconductor technology targets: to package LSIs larger than one million bit memory elements, larger than 10,000 gate logic elements; improve package density by increasing layers, density of wire boards.

111. FINANCIAL ASSISTANCE

- o Between 1976 and 1982, the Japanese government channeled at least \$500 million into major Japanese semiconductor companies in subsidies and loans.
- o This figure could reach \$2 billion if JDB loans to related sectors are included.
- o Aid can be divided into four categories:
 - government subsidies and loans for R&D (see IV)
 - loans by the Japan Development Bank and other government institutions
 - government commitments to ensure availability of private funding.
 - tax benefits.
- o JDB Loans--between 1971-82, JDB loans to the computer/semiconductor industries totalled nearly \$2.5 billion. The following specific elements of the semiconductor industry are designated to receive the "most preferential special interest rate" of 6.65%:
 - compound semiconductor elements (red emission elements excluded);
 - semiconductor ICs (limited to MOS IC's with 100,000 or more elements and bipolar IC's with 5,000 or more elements;
 - liquid crystal displays (limited to dot matrix types)
 - materials for electronic apparatus (including compound semiconductor materials or rare earth cobalt magnetic materials;
 - IC parts (including compound IC parts, surface elastic wave used filters, connectors, and multi-layer print wiring boards.)
- o Producers of the following products are eligible for the "special interest rate" of 7.7%:
 - ICs
 - Piezoelectric ceramic elements
 - High-purity silicon and ferrite products.

- o The lower-than-market rates are further improved by the waiver of the requirement for compensating balances which would prevail for commercial funding.
- o In addition to loans to promote capital investment by leading firms, the JDB makes loans at favored rates to the major computer/semiconductor firms for modernization of production equipment. Ten billion yen (about \$45.5 million) was budgeted for this purpose in 1981.
- o -Private sector lending-The law also commits the government to ensure that private commercial lending --at market rates--is available for semiconductor firms.
- o -Tax Advantages - Are also spelled out in the Elevation Plan:
 - special depreciation for production equipment: equipment used in production of newly developed technologies may be depreciated in the first year by an amount equal to one third of initial book value.
 - 20% of all increased expenditures on R&D can be taken as a tax credit.

iv. GOVERNMENT SUPPORT FOR R&D

- o PL 64 specifies MITI's role in directing and promoting semiconductor R&D:
 - calls on MITI to prepare "Elevation Plans" for R&D that would establish detailed technology objectives, and establish R&D funding requirements,
 - gives MITI authority to procure funds necessary to carry out the R&D;
 - authorizes MITI to direct firms to cooperate on R&D.
- o In promoting leading edge R&D, MITI provides funds, personnel, laboratory facilities, and overall coordination. The objective of the R&D is to concentrate research and minimize duplication. Common to such research efforts are:
 - formation of research associations of MITI scientists and researchers from major semiconductor firms;
 - development of commercial products;
 - information sharing among participants;
 - division and allocation of research funds;
 - technology licenses retained by MITI (in some cases by research cartel as well);
 - government funding.

o In 1973-1974, MITI granted Y 3.5 billion to eight Japanese firms for development circuits. MITI also spent about Y 69 billion on the Large Scale Computer project of the early 1970s; although most funding was earmarked for computer development, monies were spent on semiconductor R&D.

c Major (current government-sponsored R&D projects in semiconductors, and government subsidies involved are:

-- VLSI (1976-1979)	\$132 million
-- New Function Elements (1981-1990)	\$144 million
-- Supercomputers (1981-1989)	\$ 55 million
-- Optoelectronics (1979-1986)	\$ <u>41 million</u>

TOTAL \$342 million

o The NTT contribution to the VLSI project is estimated at \$350 million.

o NTT transferred technology for 256K RAM devices to three major Japanese firms -- at no cost. NTT's R&D costs to develop the device are unknown.

o In addition, an unknown amount is allocated by MITI to about 20 smaller companies engaged in semiconductor R&D.

o In addition to these large projects, MITI grants funding to individual companies for "Important Technologies R&D;" several of these are granted to semiconductor companies.

o There are also nonquantifiable financial advantages accruing from government R&D sponsorship. Government aid, particularly when granted to firms undertaking R&D as a group, greatly reduces R&D costs for all firms--not just by the amount of the subsidy, but also by minimizing or eliminating "false starts" and duplicative R&D.