

IMPACT OF UNFAIR FOREIGN TRADE PRACTICES

HEARING
BEFORE THE
SUBCOMMITTEE ON ECONOMIC GOALS AND
INTERGOVERNMENTAL POLICY
OF THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES
NINETY-NINTH CONGRESS

FIRST SESSION

MARCH 20, 1985

Printed for the use of the Joint Economic Committee



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[Created pursuant to sec. 5(a) of Public Law 304, 79th Congress]

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IMPACT OF UNFAIR FOREIGN TRADE PRACTICES

WEDNESDAY, MARCH 20, 1985

CONGRESS OF THE UNITED STATES, SUBCOMMITTEE ON ECONOMIC GOALS AND INTERGOVERNMENTAL POLICY OF THE JOINT ECONOMIC COMMITTEE,

Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room SD-538, Dirksen Senate Office Building, Hon. Lloyd Bentsen (vice chairman of the subcommittee) presiding.

Present: Senators Bentsen and Proxmire.

Also present: George R. Tyler, professional staff member.

OPENING STATEMENT OF SENATOR BENTSEN, VICE CHAIRMAN

Senator BENTSEN. Welcome to the second of a series of hearings that this subcommittee is holding on international trade.

At the first hearing we heard that the Federal deficit added substantially to the trade deficit, and it created a bloated dollar on foreign exchange markets. A study by Data Resources, Inc., released at that hearing revealed that the overvalued dollar was responsible for some \$55 billion, or 45 percent of the \$123 billion trade deficit in 1984.

Now, there are other factors that are responsible for the balance of the trade deficit. In today's hearing we'll be examining two of those other factors: Unfair foreign trade practices which are used to block U.S. exports and to subsidize foreign goods that compete with our exports. A number of nations make very effective use of those kinds of practices today.

According to the Department of Commerce, unfair Japanese trade barriers were responsible for some \$12 billion of our \$37 billion trade deficit with Japan last year. That translates into 400,000 lost jobs in this country. The subcommittee is releasing a report this morning noting that these barriers have cut our semiconductor exports alone by as much as \$2 billion a year, at a cost to us of some 27,000 jobs.

Let me give you an example of what's happening using this chart. What this chart shows is that in one of our most competitive industries, tobacco, we have only 2 percent of the market in Japan, 2 percent, whereas in the rest of the world we have 25 percent. When we get to pharmaceuticals, and we certainly are competitive there, we are talking about 3 percent of the market in Japan, 8 percent in the rest of the world. Telecommunications, we are certainly one of the world's leaders there, we have 4 percent of the

market in Japan, 11 percent in the rest of the world. In semiconductors, 11 percent in Japan, 53 percent in the rest of the world. Computers, 27 percent in Japan, 60 percent in the rest of the world. Computer software, 5 percent in Japan, 70 percent in the rest of the world. Electronic components, 7 percent in Japan, 23 percent in the rest of the world. Medical devices, 8 percent in Japan, 17 percent in the rest of the world.

Now, these are competitive U.S. industries. The chart gives you an example of some of the restrictions that we are running into there because the Japanese protect their home markets.

[The chart referred to follows:]

U.S. EXPORTS MARKET SHARE

MARKET SHARE
SUPPLIED BY U.S. EXPORTS

| PRODUCT | <u>TO JAPAN</u> | <u>TO REST OF WORLD</u> |
|-----------------------|-----------------|-------------------------|
| TOBACCO | 2% | 25% * |
| PHARMACEUTICALS | 3 | 8 |
| TELECOMMUNICATIONS | 4 | 11 |
| SEMICONDUCTORS | 11 | 53 |
| COMPUTERS | 27 | 60 |
| COMPUTER SOFTWARE | 5 | 70 |
| ELECTRONIC COMPONENTS | 7 | 23 |
| MEDICAL DEVICES | 8 | 17 |

*EUROPE

Senator BENTSEN. Unfair trade practices, of course, are not restricted to Japan. The European Community has forced U.S. wheat farmers out of markets like Algeria with cash subsidies to European wheat farmers as high as \$80 a ton.

Inefficient European sugar beet farmers receive 27 cents a pound for the sugar that they produce in the EC who then turns around to sell it on the world markets for 4.7 cents with European taxpayers making up the difference. Here are the results that have happened because of that subsidy: The price of an acre of farmland in France dedicated to sugar beets has gone from \$1,000 an acre to \$7,000 at the same time the price of that kind of land in the United States has gone downhill and you see all kinds of foreclosures.

One of the problems that our farmers have is not that they are not competitive; they are. But they are competing not against farmers but against countries, and they can't compete against those kinds of fire sale prices in world markets.

That kind of export subsidy on the part of the European Common Market cost Central America \$3 billion last year, because that's one of their principal exports, sugar. You talk about something that's added to the unrest, to the political instability, and economic instability of an area. It has done that for Central America.

The Japanese seem to be aware of our growing frustration with the growing trade imbalance; the Europeans, as well, are pleading for time, and are promising to lower their barriers.

In the case of Japan, we are about to undergo a litmus test of their sincerity: At some point quite soon the Japanese Government will issue new regulations covering telecommunications imports. Japanese officials promise that the new regulations will open their telecommunications market wider to U.S. firms.

Our negotiators reported no progress to the Finance Committee recently, the draft regulations they have seen would have prevented American companies from selling in Japan. Now, though, they say they have seen revised drafts and report some progress. But the history in these kind of negotiations is full of ups and downs, so you don't yet know what that final result is going to be. Up to now there has been no such thing as free trade with Japan. What they wanted is a free hand and a license to continue to sell their subsidized goods in our free market while severely restricting our access to their own.

In the past, we have sat with the Japanese and we have talked with them and we have shown sympathy to their pleas for understanding and more time. We have accepted those promises at face value and we have announced breakthroughs and returned home all aglow to await the action that just doesn't happen. My attitude is that we ought to stop talking with the Japanese until they give us a sign of their good faith, and these new heralded telecommunications regulations will be as good a sign as any. We have a distinguished panel of witnesses today.

I welcome Mr. Michael Bowen, the chief executive officer of Intecom, on behalf of the American Electronics Association; Mr. Winston Wilson, president of the U.S. Wheat Associates; and Mr. Ronald Myrick of Mostek, on behalf of the semiconductor industry.

Gentlemen, will you please come up and take your seats.

I would like to now call on the distinguished former chairman of this committee, one who has had a continuing high interest in its activities, and who has done much in trying to solve some of the economic problems this country faces.

OPENING STATEMENT OF SENATOR PROXMIRE

Senator PROXMIRE. Thank you very much, Mr. Vice Chairman. I want to congratulate you on holding these hearings and having these excellent witnesses.

You spotlighted what I think is one of the more serious and neglected economic problems we have, and that's our very, very adverse balance of trade, the worst we have ever had in the history of our country by far, and expect to be worse this year than it was last year when it broke all records. This, of course, as you indicate, means a loss of jobs, it means the loss of industrial skills and capacity, it means a loss of property values.

In breaking down the reasons for this, the bloated dollar and our deficit, which of course is a big reason, we discussed that at the last hearing. But this chart I think is most helpful, because what it shows is that we have from one-half the penetration in the Japanese market to one-twelfth penetration in the Japanese market we have elsewhere in the world.

Of course, there could be an explanation for one or two of these areas, perhaps, but it seems that there's no question that there has been a systematic effort on the part of the Japanese to exclude our exports. Japan represents a very, very high proportion of our total adverse balance of trade, way out of proportion to the amount of trade that we have with Japan, or the size of Japan as a country.

Japan is a friend of ours, it's a fine country, they have shown magnificent economic recovery and I think we owe them admiration and respect. They are a close ally of ours militarily. But I think we have to find some way, and I think Senator Bentsen is doing exactly right in pointing out what the facts are here so that we have the basis for working out a system that would be fair for us.

As I say, unfortunately I'm going to have to leave, but I'm going to study the testimony here this morning very carefully.

Senator BENTSEN. Thank you, Senator Proxmire.

Mr. Myrick, we are glad to have you this morning to present the study being released this morning from the Semiconductor Industry Association. I understand it has some information on how various industries and various States are affected by the Japanese trade barriers. I would hope that after the presentation of the statements that you could recount that for us. If you'll proceed, sir.

STATEMENT OF RONALD E. MYRICK, VICE PRESIDENT, SEMICONDUCTOR PROGRAMS, MOSTEK CORP., CARROLLTON, TX, ON BEHALF OF THE SEMICONDUCTOR INDUSTRY ASSOCIATION

Mr. MYRICK. Thank you, Mr. Vice Chairman. I am Ron Myrick, I'm a vice president of semiconductor programs with Mostek Corp. Mostek is a Texas-based manufacturer of semiconductors and other advanced electronics products. I am here today on behalf of the Semiconductor Industry Association, which represents 57 manufac-

turers of semiconductors, accounting for 95 percent of all semiconductors fabricated in the United States and Europe.

I would like to take a moment to introduce some folks who are with me who materially contributed to the preparation of the study which you have put before you: Mr. Alan Wolf, Mr. Bill Finnan, Mr. Mike Gadwall, wherever he is. All these gentlemen materially contributed to the study, and in fact during the question and answer period I should like if possible to invite Mr. Wolf to join me at the table so he may assist in answering the questions.

At the outset I would like to commend your choice of topic for this hearing: foreign trade barriers and their impact on the U.S. economy and employment. Too often the subject of trade deficits is addressed simply as a Government problem.

As you know, we have released a study today which is rather detailed in analyzing the real impact of trade barriers on that deficit. The U.S. semiconductor industry is one of this country's most successful international competitors. The industry has always been and remains the world leader technologically. This reflects the fact that the U.S. semiconductor industry has made the necessary commitments to research and development, to capital investment and to the pioneering and commercialization of new technology.

As you no doubt are aware, our principal competitive challenge comes from Japan. With considerable help from their Government, Japanese semiconductor producers have made great strides over the past decade and have actually succeeded in dominating the world market in several semiconductor lines, such as random-access memories.

Nevertheless, overall U.S. companies have consistently outperformed the Japanese over the world. In Europe, for example, which can be considered neutral as between United States and Japanese suppliers, United States companies have held 55 percent of the market in 1984, and Japanese companies only 12 percent. We outsold them by better than 4 to 1. Similarly, in the world market, excluding the United States, Europe, and Japan, U.S. companies held a 47-percent share in 1984 while Japan held only 29.

Japan itself, however, is the one market where the U.S. semiconductor industry has not enjoyed competitive success against Japanese producers. The U.S. share has never exceeded 10 or 11 percent for any sustained period. Japanese producers account for all the rest. Thus, while the United States companies outsell the Japanese 4 to 1 in Europe and 3 to 1 in the world outside Europe and Japan, they outsell us 9 to 1 in Japan. This dramatic contrast between U.S. success worldwide and United States companies' poor showing in Japan strongly suggests the presence of market barriers. They are the most formidable that the United States faces in any major world market. It's worth looking at what they are, how they came into being and what their purpose and effect are.

SIA's analysis of the Japanese market reveals that in the 1960's, Japan's Ministry of International Trade and Industry, MITI, established as a major national goal the development of an indigenous information industry including, most important, a computer and semiconductor sector. To achieve this goal MITI imposed strict restrictions on the import of foreign-made semiconductors and computers and foreign investment in the industry. At the same time

foreign technology was imported and MITI sponsored a series of R&D projects designed to enhance the level of technology. Major electronics firms were encouraged to work together and divide the effort with respect to research, development, and production, while sharing the results.

The restrictions on semiconductor and computer imports were a violation of Japan's international commitments under the General Agreement on Tariffs and Trade, and in the early 1970's, the U.S. Government put strong pressure on Japan to eliminate these restrictions and open these markets. The Japanese Government agreed to end its import and investment restrictions, but only in stages stretching out over several years. Japan's progressive, so-called liberalization of its import and investment restrictions were accompanied by MITI's liberalization countermeasures, designed to offset the effect of the lifting of restrictions. These countermeasures included MITI pressure on Japanese consumers to buy Japanese and the launching of a new generation of subsidized research and development projects.

Even after the last formal restrictions on semiconductor imports and investment were eliminated in 1975, the United States share of the Japanese market showed virtually no improvement. Although U.S. companies committed major resources to developing the market, our market share has remained in the vicinity of 10 to 11 percent. At present, as was the case a decade ago, U.S. sales in Japan are largely limited to products the Japanese do not make themselves. In 1984, the U.S. industry's share of Japanese sales, 11 percent, was virtually unchanged from its share during the era when the market was formally protected.

What is the nature of Japan's market barriers today? Japan's largest semiconductor-consuming companies are also the leading semiconductor producers. These in effect control both supply and demand, and have a collective interest in buying national. Their propensity to do so has been reinforced by many years of government efforts in urging them to undertake research and development to effectuate a division of effort between companies and to favor Japanese-made products in their purchasing decisions.

The U.S. semiconductor industry has devoted a major effort to surmounting these barriers. Many U.S. companies have established semiconductor sales and manufacturing facilities in Japan. The size of their sales forces and resource commitment has grown substantially.

Moreover, in 1982 the U.S. Government, backed by the U.S. semiconductor industry, began to mount a strong effort to reduce Japanese market barriers. A long series of bilateral negotiations was conducted by the two governments in a so-called high technology working group which was set up to address trade issues in the high tech industries. Between 1982 and early 1984, most of the high tech group's efforts were devoted to semiconductors, and primarily to the problem of market access in Japan.

The negotiations represented one of the most significant market-opening efforts undertaken by the U.S. Government with respect to Japan in many years. It has been a genuine effort, reflecting a true partnership between the U.S. Government and our industry to solve this problem. The problem has been given the maximum at-

tention by dedicated and professional officials of our Government. What have the results been?

In late 1983, after sustained U.S. Government pressure, the Japanese Government agreed to take affirmative steps to increase U.S. sales in Japan; specifically, MITI worked with the major Japanese semiconductor-consuming firms to increase their purchases of U.S. products. At the same time, demand increased generally. SIA saw U.S. sales increase perceptibly in Japan. This seemed to be an encouraging beginning; perhaps a real breakthrough.

However, the increase in sales occurred during a worldwide boom in semiconductor sales. Supply was tight in Japan and all over the world. The real test of the market-opening measures would come at the end of the tight supply period. Would the Japanese continue to buy U.S. products when that period ended?

By late 1984, semiconductors were abundantly available from Japanese sources and U.S. firms' sales in Japan were off sharply. Fourth quarter sales were lower than at any time since the second quarter of 1983. SIA companies experienced no net gain in market share for the year 1984.

So to sum up this recent experience, this market is still not open, nor, after last year, can I even say that it is beginning to open. The U.S. industry is really little better off today in terms of share of the Japanese market than when that market was formally protected by quotas and similar restrictions.

I'll digress from my prepared statement to comment on a chart which is in the study that we have provided to you. That chart shows the market share of the U.S. manufacturers in Japan over the last decade. It is being provided to you now. I'll wait for a moment while you have a chance to look at it.

This is the chart to which I refer. You'll notice that it has a series of black lines at the bottom, all hovering around the No. 10, which is 10 percent of the market. In the trade, this is known as a worm chart, because it just lays there. It never seems to do anything.

The second chart we provided you is a breakdown of some of the actions taken, either by the Japanese side or the American companies, that correspond to these percentages you see on the first chart. And you can see that no matter what was done, the chart really didn't change much.

While it is impossible to measure the precise cost to this country of Japanese market barriers in semiconductors, it is possible to make reasonable estimates of foregone revenues and jobs, and the analysis which SIS is herewith submitting to you contains that data.

SIA analyzed competition in so-called neutral markets like Europe and Southeast Asia—neutral as between U.S. suppliers and Japanese suppliers—and assumed that if the Japanese market were truly open, U.S. semiconductor companies would obtain a share of the Japanese semiconductor market roughly commensurate to our shares elsewhere in the world. The share of the U.S. markets, including Japan, is 30 percent.

Arguably, however, a better measure is our share of non-U.S. markets excluding Japan, since given Japanese market barriers, Japan is not a typical market. The U.S. share of non-United States,

non-Japanese semiconductor markets is 53 percent, as your chart shows.

In 1984, if U.S. companies had achieved a 30-percent share of the Japanese market, the U.S. industry would have enjoyed additional revenues of \$2.4 billion. If U.S. companies had a 53-percent share, which is the average in the world outside the United States and Japan, U.S. industry would have achieved \$4.2 billion in added revenues.

Starting with these assumptions, SIA has analyzed what that added revenue would mean here at home. An increase in sales revenue of \$2 billion would result in estimated increase in semiconductor industry employment—and I'm only referring here to semiconductor industry employment, not necessarily our suppliers' employment—of 21 percent; an increase in R&D expenditures of 25 percent; and a growth in internal funds available for capital investment of 26 percent.

Our economy would feel the benefit of the added capital and R&D expenditures year after year. If U.S. companies were able to increase their share of the Japanese market to 53 percent, which is the U.S. share of non-Japanese, non-United States markets, these figures would be much higher.

These benefits would, of course, be felt most noticeably in the U.S. regions which have become centers of semiconductor high technology manufacturing: California, Texas, Arizona, and New York, as examples. Looking only at employment effect on our industry, if U.S. companies were able to achieve an additional \$2 billion sales annually to Japan, SIA estimates that the result would be an additional 9,000 semiconductor jobs in California alone; 4,000 semiconductor jobs more in Texas; and 27,000 semiconductor jobs nationwide.

I would like to make it clear, however, that the problem of market barriers in Japan is more than simply a matter of foregone revenues and jobs here in the United States. Japan's protected home market is ultimately a threat to the U.S. industry in the United States and in other world markets. One of the most important characteristics of Japan's protected home market is that it provides a secure, comparatively low-risk environment for investment by Japanese semiconductor producers, a haven, a home base.

In the past, we have seen that this environment gives rise to so-called capacity-expansion races, in which the Japanese producers rapidly install major increments of production capacity with little reference to global demand trends. When periodic market contractions have occurred, the Japanese, possessing a large overhang of surplus capacity and inventory, have disposed of their surplus production overseas at deeply discounted prices. After each such experience during a recession, the U.S. share of world sales has contracted and the Japanese share has grown.

The Japanese have been adding semiconductor production capacity at a rate suggesting that they believe they can dominate the world industry by the end of this decade. With world semiconductor demand now contracting, the prospect exists that the pattern of past recessions will be repeated and that the U.S. industry may come under pressure in all world markets as Japanese firms attempt to dispose of their surpluses in a depressed market.

The best way to counter this dynamic is to gain real access to the Japanese market, the same sort of access which Japanese firms enjoy in our market. Gaining such access to their market is not just a source of added revenue for our industry; rather, it is critical to ensuring our own industry's long-run competitiveness and survival.

The U.S. Government and the U.S. semiconductor industry have devoted two decades of joint effort to expanding the U.S. market presence in Japan. To date, the results of that effort have been woefully disappointing. In SIA's view, the Japanese market remains a protected market and Japanese protection continues to impose substantial costs and risks on the U.S. industry and ultimately on the U.S. economy. The semiconductor industry has already backed a sustained effort by the U.S. Government to improve access to the Japanese market and is prepared to support further initiatives in this regard.

In addition to this study on Japanese market barriers which SIA has provided to you this morning, we should also like to provide you a paper on policy issues in 1985 from SIA's viewpoint, with specific recommendations for near-term actions by the administration and the Congress. The report of the President's Commission on Industrial Competitiveness contains many recommendations for both near-term and long-term actions which would enhance U.S. industry competitiveness in the world. Thank you, sir.

[The prepared statement of Mr. Myrick, together with the attachments referred to, follows:]

PREPARED STATEMENT OF RONALD E. MYRICK

Mr. Chairman, I am Ronald E. Myrick, Vice President, Semiconductor Programs, of Mostek Corporation, a Texas-based manufacturer of semiconductors and other advanced electronics products. I am here today on behalf of the Semiconductor Industry Association (SIA), which represents fifty-seven manufacturers of semiconductors, accounting for 95 percent of all semiconductors fabricated in the United States annually. I appreciate the opportunity to appear before your Subcommittee today.

At the outset, I would like to commend your choice of topic for these hearings, which is foreign trade barriers and their impact on the U.S. economy and employment. Too often the subject of the trade deficit is addressed simply as an import problem. I represent an industry which confronts a major long-term trade problem, but one which SIA views, most fundamentally, as a foreign market access problem. I would like to explain SIA's analysis of that problem, and hopefully, provide some perspective as to how foreign market barriers adversely affect our economy over the long term. In conjunction with my testimony I am offering to the Subcommittee a new study prepared by SIA on this subject.

The U.S. semiconductor industry is one of this country's most successful international competitors. The industry has always been, and remains, the world leader technologically. The semiconductor was invented in the United States, and virtually every major breakthrough in semiconductor technology has been made by American companies. As an industry, the U.S. industry has outperformed its foreign rivals in most foreign markets.

In significant part, this reflects the fact that the U.S. semiconductor industry has made the necessary commitments to research and development, to capital investment, and to the pioneering and commercialization of new technologies. This industry reinvests most of its profits. It spends more on R&D than most other U.S. manufacturing industries. The industry recognizes that if it fails to sustain these efforts--if it loses its edge in efficiency and innovation--it will inevitably confront a trade problem that no government program can solve. In speaking of the trade problem which this industry faces today, therefore, I do so cognizant that the principal responsibility for remaining competitive internationally lies with the industry itself.

As you no doubt are aware, our principal competitive challenge comes from Japan. With considerable help from their government, Japanese semiconductor producers have made great strides over the past decade, and have actually succeeded in dominating the world market in several semiconductor product lines, such as random access memories. Nevertheless, overall, U.S. companies have consistently outperformed the Japanese all over the world. In Europe, for example, which can be considered essentially neutral in terms of potential national bias, as between U.S. and Japanese suppliers, U.S. companies held 55 percent of the market in 1984 and Japanese companies only 12 percent--we outsold them by better than 4 to 1. Similarly, in the world market, excluding the U.S., Europe and Japan, U.S.

companies held a 47 percent share in 1984 while Japan achieved only a 29 percent share.

Japan itself, however, is the one major world market where the U.S. semiconductor industry has not enjoyed competitive success against Japanese producers. The U.S. share of the Japanese market has never exceeded 10-11 percent for any sustained period--Japanese producers account for all the rest. Thus, while U.S. companies outsell them 4 to 1 in Europe and 3 to 2 in the world outside the U.S., Europe and Japan, they outsell us by nearly 9 to 1 in Japan. This dramatic contrast between the U.S. success against the Japanese worldwide, and U.S. companies' poor showing in Japan strongly suggests the presence of market barriers. Indeed, barriers do exist. They are the most formidable that U.S. industry faces in any major world market. It is worth looking at what they are, how they came into being, and what their purpose and effect are.

The Protected Japanese Market

SIA's analysis of the Japanese market reveals that in the 1960s Japan's Ministry of International Trade and Industry (MITI) established as a major national goal the development of an indigenous information industry, including, most importantly, a computer and semiconductor sector. To achieve this goal MITI imposed strict restrictions on the import of foreign-made semiconductors and computers, and on foreign investment in the industry. At the same time, foreign technology was imported, and MITI sponsored a series of intensive industry-government R&D

projects designed to enhance the level of Japanese technology. The major electronics firms were encouraged to work together and to divide the effort with respect to research, development and production, while sharing the results.

The restrictions on semiconductor and computer imports were a violation of Japan's international commitments under the General Agreement on Tariffs and Trade (GATT), and in the early 1970s, the U.S. government put strong pressure on Japan to eliminate these restrictions and open its market. The Japanese government agreed to end its import and investment restrictions, but only in stages stretching out over several years. Japan's progressive "liberalizations" of its import and investment restrictions were accompanied by MITI's "liberalization countermeasures" designed to offset the effect of the lifting of restrictions. These countermeasures included MITI pressure on Japanese consumers to "buy Japanese", and the launching of a new generation of subsidized research and development projects.

Even after the last formal restrictions on semiconductor imports and investment were eliminated in 1975, the U.S. share of the Japanese market showed virtually no improvement. Although U.S. companies committed major resources to developing the market, our market share has remained in the vicinity of 10-11 percent. A 44 percent appreciation of the yen against the dollar between 1978 and 1980 had only a marginal effect--our share rose briefly to 14 percent in 1979, then returned to the 10-11 percent level.

At present, as was the case a decade ago, U.S. companies sales in Japan are largely limited to products the Japanese do not make themselves. In 1984, the U.S. industry's share of Japanese sales--11 percent--was virtually unchanged from its share during the era when the market was formally protected.

What is the nature of Japan's market barriers today?

Japan's largest semiconductor consuming companies are also the leading semiconductor producers. These firms, in effect, control both supply and demand, and have a collective interest in "buying national". Their propensity to do so has been reinforced by many years of government efforts encouraging them to undertake joint research and development, to effectuate a division of effort between companies, and to favor Japanese-made products in their purchasing decisions.

The U.S. semiconductor industry has devoted a major effort to surmounting these barriers. Many U.S. companies have established semiconductor sales and manufacturing facilities in Japan. The size of their sales forces and resource commitment has grown substantially.

Moreover, in 1982 the U.S. government, backed by the U.S. semiconductor industry, began to mount a strong effort to reduce Japanese market barriers. A long series of bilateral negotiations was conducted by the two governments in the so-called High Technology Working Group, which was set up to address trade issues in the high tech industries. Between 1982 and early 1984, most of the High Tech Group's efforts were devoted to semiconductors, and primarily to the problem of market access in

Japan. The negotiations represented one of the most significant market-opening efforts undertaken by the U.S. government with respect to Japan in many years. It has been a genuine effort reflecting a partnership between the U.S. government and our industry to solve this problem. The problem has been given the maximum attention by truly dedicated and professional officials of our government. What have the results been?

In late 1983, after sustained U.S. government pressure, the Japanese government agreed to take affirmative steps to increase U.S. sales in Japan. Specifically, MITI worked with the major Japanese semiconductor consuming firms to increase their purchases of U.S. products. At the same time demand increased generally -- SIA saw U.S. sales increase perceptibly in Japan, and U.S. companies reported that Japanese firms were responding to MITI guidance by increasing their sales inquiries with U.S. firms. Nine SIA companies surveyed by SIA reported that their sales in Japan increased from \$92 million in the fourth quarter of 1983 to \$134 million in the first quarter of 1984. This seemed to be an encouraging beginning, perhaps a real breakthrough. However, the increase in sales occurred during a worldwide boom in semiconductor sales. Supply was tight in Japan and all over the world. While SIA companies could have sold all of their chips to U.S. customers at that time, U.S. companies made special efforts to maintain and in fact increase the supply to the Japanese market during the tight-supply period--such was our concern with achieving a greater presence in that market for the long term.

The real test of the market opening measures would come at the end of the tight supply period. Would the Japanese continue to buy U.S. product when that period ended? By late 1984, semiconductors were abundantly available from Japanese sources, and U.S. firms' sales in Japan were off sharply. Fourth quarter sales were lower than at any time since the second quarter of 1983. SIA companies experienced no net gain in market share for the year 1984.

So, to sum up this recent experience, after the most intensive negotiating effort mounted by the U.S. government in this sector in many years, the net result was that we saw a perceptible increase in our sales for one quarter, followed by a reversion to prior levels. The net long-term impact has been zero. This market is still not open; nor, after last year, can I even say that it is beginning to open. The U.S. industry is really little better off today, in terms of share of the Japanese market, than when that market was formally protected by quotas and similar restrictions.

This problem is more than simply an exasperating situation faced by a U.S. industry overseas. Ultimately, it means foregone revenues and profits, reduced employment levels, and, potentially, erosion of our manufacturing base. I would like to be a bit more specific on these points.

The Cost to the U.S. of Japanese Market Barriers

While it is impossible to measure the precise cost to this country of Japanese market barriers in semiconductors, it is possible to make reasonable estimates of foregone revenues and jobs, and the analysis which SIA is herewith submitting to you contains such data. These estimates are based upon an analysis of the performance of the industry in international competition with the Japanese. SIA analyzed competition in "neutral" markets like Europe and Southeast Asia and assumed that if the Japanese market were truly open, with purchasing decisions made on the basis of market factors such as quality and price, U.S. semiconductor companies would obtain a share of the Japanese market roughly commensurate with our share elsewhere in the world.

The U.S. share of non-U.S. world markets, including Japan, is 30 percent. Arguably, however, a better measure is our share of non-U.S. markets, excluding Japan, since given Japanese market barriers, Japan is not a typical market. The U.S. share of non-U.S., non-Japanese semiconductor markets is 53 percent.

In 1984, if U.S. companies had achieved a 30 percent share of the Japanese market, the U.S. industry would have enjoyed added revenues of \$2.4 billion. If U.S. companies had achieved a 53 percent share--which is the average in the world outside the U.S. and Japan--the U.S. industry would have achieved \$4.2 billion in added revenues. Moreover, if the U.S. retained

this enhanced share on an ongoing basis--as it has done elsewhere in the world--this gain would accrue to the U.S. economy every year, and would increase as the Japanese market grows in size.

Starting with these assumptions, SIA has analyzed what that added revenue would mean here at home. An increase in sales revenue of \$2 billion would result in an estimated increase in semiconductor industry employment of 21 percent, an increase in R&D expenditures of 25 percent, and a growth in internal funds available for capital investment of 26 percent. Our economy would feel the benefit of the added capital and R&D expenditures year-after-year. If U.S. companies were able to increase their share of the Japanese market to 53 percent--which is the U.S. share of non-Japanese, non-U.S. markets--these figures would be much higher.

These benefits would, of course, be felt most noticeably in the U.S. regions which have become centers of semiconductor high technology manufacturing, notably California, Texas, Arizona and New York. Looking only at the employment effect on our industry, if U.S. companies were able to achieve an additional \$2 billion in sales annually to Japan, SIA estimates that the result would be an additional 9 thousand jobs in California alone, 4 thousand more in Texas, and 27 thousand nationwide.

I would like to make it clear, however, that the problem of market barriers in Japan is more than simply a matter of foregone revenues and jobs here in the United States. Japan's protected home market is ultimately a threat to the U.S. industry in the United States and in other world markets.

One of the most important characteristics of Japan's protected home market is that it provides a secure, comparatively low-risk environment for investment by Japanese semiconductor producers. In the past, we have seen that this environment gives rise to "capacity-expansion races" in which Japanese producers rapidly install major increments of production capacity with little reference to global demand trends. When periodic market contractions have occurred, the Japanese, possessing a large overhang of surplus capacity and inventory, have disposed of their surplus production overseas at deeply discounted prices. As SIA has documented in past studies, such periodic surges of low-priced Japanese semiconductor exports have inflicted severe damage on segments of the U.S. semiconductor industry, and have caused some U.S. companies to withdraw from key product areas, such as high density computer memories, altogether.

After each such experience during a recession, the U.S. share of world sales has contracted, and the Japanese share has grown. Another such export surge may now be imminent.

The Japanese have been adding semiconductor production capacity at a rate suggesting that they believe they can dominate the world industry by the end of this decade. With world semiconductor demand now contracting, the prospect exists that the pattern of past recessions will be repeated--and that the U.S. industry may come under pressure in all world markets as Japanese firms attempt to dispose of their surpluses in a depressed market.

The best way to counter this dynamic is to gain real access to the Japanese market -- the same sort of access which Japanese firms enjoy in our market. Gaining such access to their market is not just a source of added revenue for our industry: rather, it is critical to ensuring our own industry's long-run competitiveness and survival.

The U.S. government and the U.S. semiconductor industry have devoted two decades of joint effort to expanding the U.S. market presence in Japan. To date, the results of that effort have been woefully disappointing. In SIA's view, the Japanese market remains a protected market, and Japanese protection continues to impose substantial costs and risks on the U.S. industry, and ultimately on the U.S. economy as a whole. The semiconductor industry has already backed a sustained effort by the U.S. government to improve access to the Japanese market, and is prepared to support further initiatives. A renewed effort by both governments is needed to address this problem. In this regard, in addition to the study on Japanese market barriers which SIA is providing to this subcommittee, we should also like to provide a paper on policy issues for 1985 from SIA's viewpoint with specific recommendations for near term actions by the administration and the Congress. Furthermore, the report of the President's Commission on Industrial competitiveness contains many recommendations for both near term and long-term actions which would enhance U.S. industry competitiveness.

THE IMPACT OF JAPANESE MARKET BARRIERS
IN MICROELECTRONICS

An Analysis Prepared for the
Joint Economic Committee
Subcommittee on Economic Goals
and Intergovernmental Policy

by the

Semiconductor Industry Association

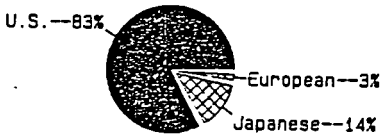
March 20, 1985

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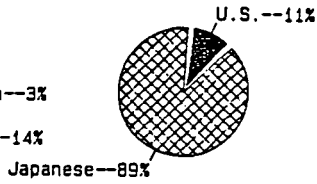
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SEMICONDUCTOR MARKET SHARE

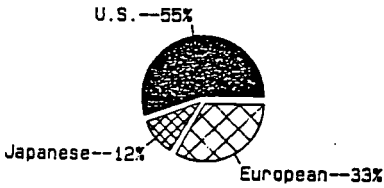
1984



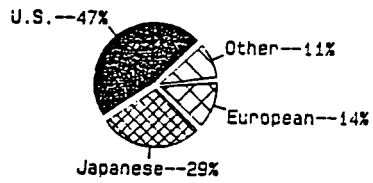
U.S. MARKET
\$11.6 BILLION



JAPANESE MARKET
\$8 BILLION



EUROPEAN MARKET
\$4.74 BILLION



OTHER MARKETS
\$1.7 BILLION

Semiconductors are the basic building blocks of high technology. They contain the extraordinarily complex circuitry that has made possible the development of advanced computers, telecommunications equipment, a wide range of consumer electronics products, industrial robots, "smart" weapons, and many other advanced technologies. Semiconductors were invented in the United States and virtually all breakthroughs in semiconductor technology have been made by American companies. The semiconductor industry has emerged as one of this country's most internationally competitive industries.

For over 20 years the U.S. semiconductor industry has devoted a major effort to expand its sales in Japan, which, with its large electronics sector, represents the largest semiconductor market in the world outside the United States. However, U.S. firms have never been able to achieve a percentage of sales in Japan which is remotely commensurate with their sales elsewhere in the world.

U.S. semiconductor companies compete with Japanese firms all over the world, and except in Japan, outperform them by a wide margin. In 1984, for example, U.S. companies accounted for 55 percent of Europe's consumption of semiconductors, while Japanese firms achieved only a 12 percent share of the European market. In the world excluding Japan, the U.S. and Europe, U.S. firms held a 47 percent share and Japanese firms, a 29 percent share. By contrast, in Japan itself, U.S. firms accounted for only 11 percent of sales in 1984, while Japanese companies captured the remaining 89 percent. These figures, by themselves,

suggest that barriers to U.S. sales exist in Japan which prevent them from achieving a share more comparable to that which they have attained elsewhere in the world.

This paper analyzes the market barriers which U.S. semiconductor companies have encountered in Japan during the past two decades. These barriers have consisted of both formal government protective measures and the evolution of a market structure that has proven highly resistant to foreign products. The paper also examines the costs which those barriers impose on U.S. companies and workers, and the implications which these barriers hold for the industry's long run competitiveness.

I. THE FAILURE OF RECENT MARKET OPENING EFFORTS.

Many U.S. industries have analyzed the barriers which they confront in their attempts to achieve a significant level of sales in the Japanese market. The case of semiconductors is particularly noteworthy, however, for several reasons.^{1/} First, the U.S. semiconductor industry is highly competitive internationally, and, despite vigorous competition from Japan, has won a much larger share of virtually every world market than any of its foreign rivals, including the Japanese. Second, U.S. semiconductor companies have made a major long-term commitment -- entailing a substantial, sustained effort over a period of two decades -- to expand their presence in Japan. As a result of this effort, the U.S. semiconductor industry has learned a great deal not only about the nature of the barriers to market access in Japan but about the significance -- or lack thereof -- of Japan's periodic "liberalization" packages, usually undertaken in response to U.S. government pressure. In effect, this is one U.S. industry whose experience in Japan cannot be dismissed simply as a reflection of its lack of international competitiveness or lack of sales efforts in Japan.

Prior to 1975 protection of the domestic semiconductor industry was official Japanese government policy. Pursuant to policies developed by the Ministry of International Trade and Industry (MITI), imports and foreign investment in semiconductors

^{1/} A major subcategory of semiconductors frequently alluded to in this study is integrated circuits (ICs).

were restricted while MITI sponsored a series of intensive promotional projects designed to establish a competitive indigenous semiconductor industry. As segments of the industry reached an internationally competitive level, the formal protective barriers were removed in a series of "liberalization" measures -- although at the same time, the Japanese government implemented "liberalization countermeasures" designed to offset the real effect of "liberalization."^{2/}

When the Japanese market was formally protected by the government before 1975, U.S. semiconductor companies were able to achieve a market share in Japan of approximately 10-11 percent, reflecting sales of U.S. products which the Japanese could not yet make themselves. Significantly this U.S. market share has remained virtually unchanged through the present, despite a long series of "liberalization" measures. In 1984, U.S. firms' share of the Japanese market remained at 11 percent. At present, as in the early 1970s, U.S. firms' sales remain largely limited to products which Japanese firms do not make themselves.

Today, the principal barrier to U.S. company sales is the structure of the market itself. Japan's principal semiconductor consuming companies are the same major electronics firms that are also its largest semiconductor producers -- they control both supply and demand. Reflecting decades of government pressure to engage in collusive product development, to pursue

^{2/} The history of Japan's protective measures, as well as of the "liberalization" measures and countermeasures, is addressed in Appendix A of this study.

"rationalization" and division of labor with respect to production, and to "buy national," these companies have evolved a complex pattern of customer-supplier relationships which largely excludes foreign firms.^{3/} Thus, while formal protection has been phased out, the barriers to market access remain. The difficulty in surmounting those barriers was underscored by the major market opening effort which was mounted by the U.S. government and U.S. semiconductor industry between 1982 and 1984.

In 1982, the U.S. and Japanese governments began a series of intensive bilateral discussions designed to identify and address sources of trade friction in semiconductors in the so-called "High Technology Working Group." One of the principal subjects was the need to improve U.S. companies' access to the Japanese market. The U.S. side argued that Japan's history of protection had fostered attitudes among Japanese semiconductor consuming firms which led them to continue to pursue "buy national" policies even after formal import restrictions had been lifted. The Japanese side, while disagreeing with much of the U.S. characterization of Japanese practices, was not unreceptive to the proposition that steps could be taken to improve U.S. companies' market opportunities in Japan. MITI in particular, as well as several Japanese electronics executives, appeared to have reached the conclusion that an effort to bolster U.S. semiconductor firms' market access was warranted.

^{3/} The Japanese market structure is addressed in Appendix A.

In early 1983, the U.S.-Japan High Tech Working Group adopted a series of joint recommendations with respect to semiconductor trade. These recommendations were subsequently endorsed by the Japanese government and the U.S. Cabinet. The Semiconductor Recommendations provided that both governments should work to eliminate barriers to market access in high technology. The Recommendations specifically provided that

The Government of Japan develop possible concrete measures to promote imports of manufactured goods in high technology in light of the Prime Minister's [Nakasone] May 28 statement, taking into account the views and activities of the Work Group.^{4/}

In the fall of 1983, the Japanese began a series of measures which appeared to herald a breakthrough in the longstanding market access impasse. MITI began encouraging major Japanese semiconductor-consuming companies to increase their purchases of U.S.-made semiconductors. At the same time, the U.S. and Japan established a system of semiconductor trade data collection, designed to provide both nations with a more accurate picture of semiconductor trade patterns -- making it possible, among other things, to monitor the progress of U.S. firms' sales efforts in Japan.^{5/}

^{4/} Semiconductor Recommendations Part II.A.2., paragraph 4.

^{5/} Under this Data Collection System, U.S. and Japanese semiconductor manufacturers report their sales in the U.S. and Japanese markets. These sales are broken out for quantity by specific product area and for value by general groupings of products. The system is intended to permit the two governments to analyze semiconductor trade based on a single, commonly accepted, data source.

Concurrently, major U.S. semiconductor companies stepped up their sales efforts in Japan. SIA not only reviewed current trade data to monitor the results of these efforts, but periodically surveyed U.S. companies operating in Japan for reports on the progress and problems that were occurring. Companies were asked whether they had seen evidence of increased efforts by Japanese firms to purchase semiconductors from U.S.-based companies, what the responses of particular Japanese firms had been, and whether they were developing new long term customer-supplier relationships with Japanese customers. They provided data with respect to order bookings and billings in Japan. This information gave SIA a detailed, ongoing picture of the progress of the market opening effort.⁶

The initial indicators were encouraging. A number of major Japanese companies reported that after discussions with MITI officials they had increased their purchases of U.S. semiconductors, and a number of these companies began approaching U.S. semiconductor firms with purchase inquiries. One U.S. executive reported that

Hitachi quickly made a contact with (us) showing . . . (a) procurement list. NEC, Fujitsu, Toshiba and Sony also made aggressive actions . . . with procurement list or inquiries asking our supply capabilities on various products

Another commented that

^{6/} The subjects of the survey were nine U.S. companies operating in Japan which form SIA's Tokyo Chapter. In 1983 these nine companies represented over 31 percent of world semiconductor sales (Dataquest). They are referred to hereafter as the "SIA companies." The survey is conducted each quarter by Verner, Liipfert, Bernhard, McPherson and Hand, Chartered for the Semiconductor Industry Association.

Fujitsu has started making positive efforts to purchase more of our products.... Overall it looks to me that major Japanese users are trying to continually increase their usage of U.S.-produced ICs across a broad range of products.^{7/}

These impressions appeared to be corroborated by U.S. semiconductor companies' bookings for sales in Japan in early 1984. Cumulative bookings of nine major U.S. suppliers to Japan increased from \$91.81 million in the fourth quarter of 1983 to nearly \$134 million in the first quarter of 1984 (Figure 1). The nine SIA companies also reported a modest increase in their share of the Japanese market, from 4.3 percent in 1983 to 4.7 percent in 1984.^{8/}

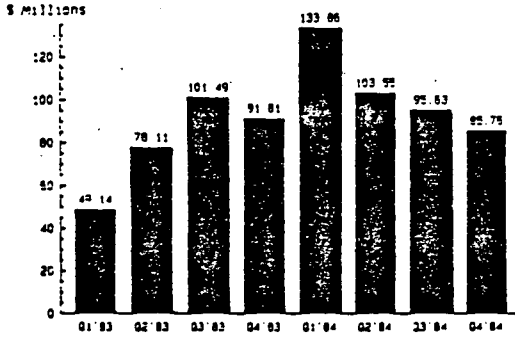
However, it was apparent during this period that any lasting judgements about the success of the market opening measures would be premature. In late 1983 and early 1984, worldwide demand for semiconductors was booming. U.S. and foreign producers were experiencing a mounting backlog of orders as they sought to meet this demand, and a short-supply situation developed in Japan and elsewhere in the world. This led a number of U.S. semiconductor executives to warn that increased Japanese purchases of U.S. chips might at least partially reflect an effort to secure an

^{7/} Other similar comments included the following: "We have received qualitatively different treatment than in contact 9-12 months ago. They seem more eager to contact us." "We have seen an increased awareness that U.S. vendors should be considered the same as Japanese vendors. We have not seen any quantitative results."

^{8/} The U.S. Department of Commerce estimated the Japanese semiconductor market at \$5.485 billion in 1983 and \$7.96 billion in 1984. The nine SIA companies' billings increased from \$237 million in 1983 to \$378 million in 1984.

FIGURE 1

**SIA MEMBER COMPANIES' BOOKINGS IN JAPAN
BY CALENDAR YEAR QUARTER -- \$ MILLIONS ***



* Based on responses by nine SIA Members, representing 31% of total world semiconductor sales, to a survey conducted in November, 1984.

adequate supply of semiconductors during a shortage rather than a long term trend toward increasing their procurement from U.S. companies.

In fact, in 1983 and early and mid-1984, a number of U.S. semiconductor companies reported that while in some cases sales were up, they had not been able to establish long term relationships with major Japanese companies.^{9/} One executive commented that

We have good relationships with [four Japanese companies] but this is because we are allocating key products in a shortage market. We don't know where this takes us in the long term.

Another remarked that

During the shortage, many customers gave lip service to 'long term relationship.' Only during the next downturn will we know how secure those relationships really are. No one has offered us long term firm contracts.

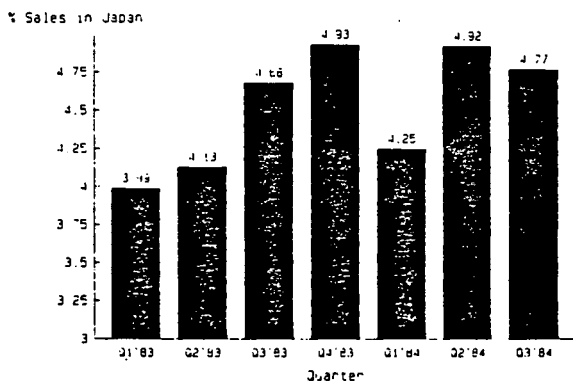
U.S. executives commented that the largest six Japanese semiconductor-consuming firms appeared to be seeking to purchase more semiconductors from U.S.-based firms, but that other firms had apparently not shown any sign of altering traditional buying patterns.

During the tight supply period of late 1983 and early 1984, the SIA companies mounted a special effort to supply the Japanese market despite the fact that they were under pressure from customers in all markets to supply products and could have made

^{9/} A few companies did, however, report longer term contracts. One U.S. company reported that it had completed a 3-year supply agreement with one Japanese company and was in the process of negotiating a 2-year agreement with another firm.

FIGURE 2

PERCENTAGE OF WORLDWIDE BILLINGS MADE
IN THE JAPANESE SEMICONDUCTOR MARKET --
WEIGHTED AVERAGE OF 9 U.S. COMPANIES



Based on responses by nine SIA members representing 31% of total world semiconductor sales, to a survey conducted in November, 1984.

all of their sales to existing U.S. customers.^{10/} These companies' billings made in the Japanese market actually increased substantially as a percent of their total worldwide billings during the shortage period (Figure 2).

In late 1984, semiconductor demand began to drop both in Japan and worldwide, a trend that has continued into 1985. The period of extreme demand and tight supply has ended. At the same time, bookings of new orders by the SIA companies in Japan began to decline, with fourth quarter 1984 bookings lower than those experienced in the fourth quarter 1983. A number of the executives, surveyed by SIA, made the following comments:

- ° Now that the market has softened, we no longer hear of the MITI urging. Likewise during the shortage times we heard a great deal regarding "long term relationships," now, with a readily available supply, we hear more about "quality, price, timely delivery."
- ° We have seen a trend developing by a few of our customers to revert back to their original Japanese source of supply.
- ° We believe that top management of our large customers attempts to set corporate policy which [would result in increased semiconductor imports]. However, further down into the organization the decisionmakers are usually purchasing managers and engineering managers, and these people tend to recommend Japanese product first.

^{10/} During the tight supply period, U.S. semiconductor companies intensified their sales efforts in Japan; in addition to increases in sales in Japan as a percent of total sales, these efforts included increases in 1) the size of the companies' sales forces in Japan, 2) the frequency of visits to Japan by top level U.S. executives, and 3) the seniority of individuals assigned to handle the companies' operations in Japan.

Top level corporate purchasing people have been approached by MITI. Those companies which are open to foreign suppliers continue to be open. Those that are closed ignore MITI. Net effect is zero.

This recent experience suggests that despite MITI's recent market-opening efforts, the U.S. semiconductor producers' role in the Japanese market is not much different than it was when the market was formally protected a decade ago -- they are residual suppliers to whom Japanese customers turn when no Japanese source of supply is available or when Japanese firms do not produce a comparable product. In periods of tight supply, these firms may enjoy increased sales, but overall such short-term sales have not ripened into long term supply relationships. As one surveyed U.S. executive put it,

Basically, the U.S. supplier has an opportunity when a product is not available from a Japanese source or is in short supply.

As a result, the U.S. share of the Japanese market, after fifteen years of "liberalization" measures and MITI's recent import promoting efforts, is virtually unchanged from the period when the market was formally protected (Figures 3 & 4). The 1983-84 import promoting effort appears to have produced, temporarily, a slight increase in U.S. share, but this is proving a transient gain. U.S. bookings in Japan are now declining and are lower than they were at the time of the conclusion of the High Tech Working Group's Semiconductor Recommendations in late 1983.

While the market performance of U.S. companies in Japan has sometimes been attributed to the comparative competitiveness of

FIGURE 3

**"LIBERALIZATION" MEASURES, U.S. INVESTMENT ATTEMPTS,
AND YEN APPRECIATION HAVE HAD LITTLE EFFECT
ON U.S. MERCHANT FIRMS' PENETRATION OF THE JAPANESE MARKET**

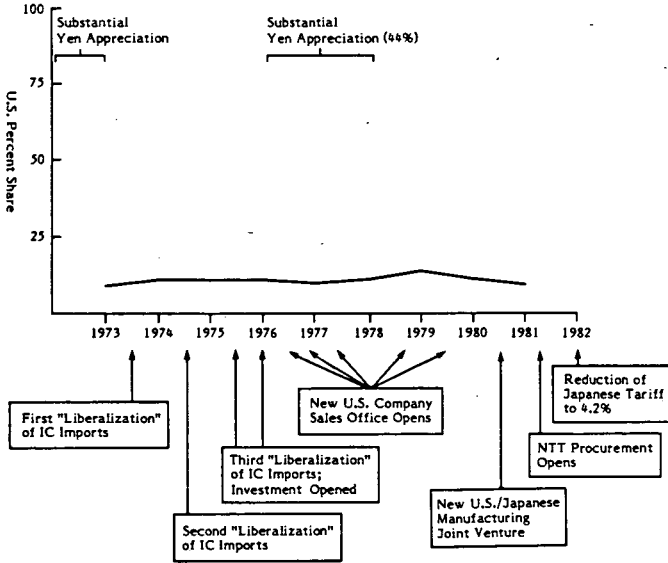
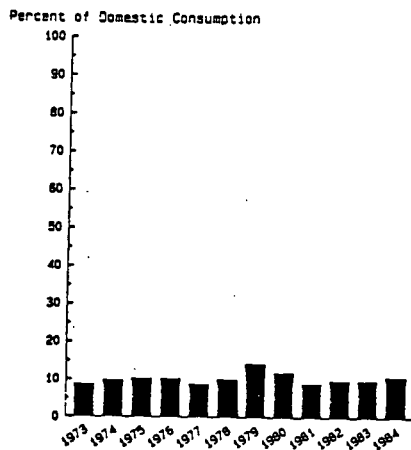


FIGURE 4

U.S. SHARE OF THE JAPANESE SEMICONDUCTOR MARKET



U.S. and Japanese companies, the U.S. industry has consistently out-performed its Japanese rivals in "neutral" markets such as Europe. In 1984, for example, U.S. firms accounted for 55 percent of semiconductor sales in Europe while Japanese firms accounted for only 12 percent. Similarly, in the world market excluding Japan, the U.S. and Europe, U.S. companies accounted for 47 percent of sales and Japanese companies for 29 percent. These figures suggest that if a truly open market for semiconductors existed in Japan -- with purchasing decisions based on factors like price and quality rather than nationality of the seller -- U.S. companies would enjoy a far greater proportion of total sales.

It is worth examining the costs which Japanese market barriers impose on the U.S. industry in this sector.

II. THE IMPORTANCE OF OPENING THE JAPANESE SEMICONDUCTOR MARKET TO THE U.S. SEMICONDUCTOR INDUSTRY

Introduction

While it is impossible to measure the precise cost to the United States of Japanese market barriers in semiconductors, it is possible to make sound estimates based on reasonable assumptions. Based on the assumptions explained below, if the Japanese semiconductor market operated on purely free market principles, sales by U.S. firms in Japan could be expected to increase by \$1.5 to \$3.3 billion over the 1984 level of \$0.9 billion.* The direct benefits to the U.S. industry from this increase in sales would be a 13 to 21 percent gain in employment, a 32 to 69 percent increase in profits, and an increase in U.S. semiconductor parts and products exports of \$1 to \$2 billion -- possibly eliminating the bilateral trade deficit in semiconductors. As the Japanese semiconductor market continues to grow, this enhanced market share would provide still greater ongoing benefits in terms of employment, profitability, and exports.

The importance of achieving real access to the Japanese market for U.S. semiconductor firms is underscored by the prospects of a future overhang of productive capacity. So long as Japanese semiconductor companies continue to operate in a protected home market they will not be subject to the restrictions on investment in new capacity which market conditions would normally impose. This creates a serious

*/ The factual data and analysis for Section II and Appendix B were provided by Quick, Finan and Associates.

potential long term problem because it can lead to trade practices which are actionable under U.S. law. Only access to the Japanese semiconductor market can provide a long term solution to this problem.

What Would an Open Japanese Market Mean to the U.S. Semiconductor Industry?

In 1984 the Japanese market for semiconductors represented \$8.0 billion or 38 percent of the total available world market of \$26 billion. Sales by U.S. firms in Japan in 1984 were about \$900 million, or about 11 percent of the Japanese market -- roughly the same as the U.S. share in 1972, before Japan started to remove its formal restrictions on imports of U.S. semiconductors and investments by U.S. firms. But the Japanese government's decision to target the semiconductor sector for development in the early '70s led to the creation of a complex set of policies, or "countermeasures" which have continued to limit U.S. penetration of the Japanese semiconductor market despite "liberalization".

If U.S. semiconductor firms were to obtain genuine access to the Japanese market, using 1984 as a benchmark year, sales by U.S. firms in Japan would be expected to increase to a level of between \$2.4 billion and \$4.2 billion. This immediate increase of \$1.5 to \$3.3 billion over the 1984 level would boost worldwide sales for U.S. firms 11 percent to 24 percent. The U.S. share of the Japanese semiconductor market would increase to a range of 30 percent to 53 percent -- in line with market shares U.S. firms obtain in competition against Japanese firms in non-U.S. markets.

- o The \$2.4 billion estimate is derived by taking the U.S. semiconductor industry's average share of non-U.S. markets, including Japan, which is 30 percent.
- o The \$4.2 billion estimate is derived by taking the U.S. semiconductor industry's average share of non-U.S. markets, excluding Japan, which is 53 percent. In both the European and rest of world markets, where U.S. firms face significant Japanese competition and in which the value of the dollar has increased more rapidly than it has with respect to the yen, the U.S. firms' market share has remained constant since 1982.

The use of the U.S. share of non-U.S. markets to estimate what the U.S. share would be in Japan seems reasonable since U.S. firms face Japanese competition worldwide. The issue is what the differential barriers present in the Japanese market cost the U.S. industry.

Could the U.S. industry actually increase sales by \$1.5 to \$3.0 billion in the near term? The answer is yes. From 1982 to 1983 the U.S. industry's production rose by \$1.7 billion and between 1983 and 1984 U.S. production rose another \$4.3 billion. The U.S. industry today has sufficient capacity to permit it fully to exploit any burgeoning of Japanese demand for U.S. products which might result from market liberalization.

The following table shows how the potential expansion of U.S. sales into Japan would positively affect the U.S. industry. These estimates were developed from looking at actual U.S. firm performance over the past ten years during periods of expanding sales.

For an increase in U.S. Production of
\$1 billion \$2 billion

| | | |
|---|-----|-----|
| ° U.S. Employment Increases | 13% | 21% |
| ° R&D Expenditures Increase | 14% | 25% |
| ° After Tax Profits Increase | 32% | 69% |
| ° Internal Funds Available for Capital Investment Increase | 13% | 26% |

The potential change in total U.S. employment from the increase in U.S. semiconductor firms' sales in Japan, broken down by state gains in employment and wages are as follows:

| | <u>\$1 Billion Increase</u> | | <u>\$2 Billion Increase</u> | |
|------------|-----------------------------|----------------------|-----------------------------|----------------------|
| | Employment (Thousand) | Wages (\$Million) | Employment (Thousand) | Wages (\$Million) |
| Arizona | 2.0 | 50 | 3.0 | 78 |
| California | 6.0 | 156 | 9.0 | 234 |
| New York | 1.7 | 44 | 2.7 | 70 |
| Texas | 2.4 | 62 | 4.0 | 104 |
| Other | <u>4.9</u> | <u>44</u> | <u>8.3</u> | <u>62</u> |
| Total | 17.0 | \$356 | 27.0 | \$548 |

Liberalization of the Japanese semiconductor market would have significant benefits for the U.S. bilateral trade balance in semiconductors. The table below, based on U.S. Department of Commerce data, summarizes the recent bilateral trade pattern:

| | <u>1983</u> | <u>1984(p)</u> |
|--------------|--------------------------------|----------------|
| | (Total Semiconductor - Mil \$) | |
| U.S. Imports | 918 | 1,979 |
| Exports | 252 | 351 |
| Balance | <u>666</u> | <u>1,628</u> |

of which:

(Total Integrated Circuits - Bil \$)

| | | |
|--------------|------------|--------------|
| U.S. Imports | 651 | 1,483 |
| Exports | 171 | 238 |
| Balance | <u>480</u> | <u>1,245</u> |

(Total MOS Integrated Circuits - Bil \$)

of which:

| | | |
|--------------|------------|--------------|
| U.S. Imports | 544 | 1,278 |
| Exports | 87 | 101 |
| Balance | <u>457</u> | <u>1,177</u> |

U.S. firms currently supply the Japanese market through three channels: (1) direct exports from the United States -- this supports about 50 percent of total U.S. sales in Japan; (2) exports which flow through Southeast Asia where value is added to the semiconductor parts of U.S. origin (this represents about 10 percent of total sales in Japan by U.S.-based companies); and (3) production by U.S.-owned affiliates in Japan -- this accounts for the remaining 40 percent.

An increase in U.S. sales in Japan of \$1.5 billion should generate approximately \$0.8 to \$1 billion in U.S. semiconductor exports, while an increase of \$3.0 billion in sales in Japan would generate about \$1.5 to \$2.1 billion in increased U.S. export -- enough to eliminate the 1984 bilateral deficit in semiconductor trade between the United States and Japan.

In sum, opening the Japanese market would enlarge the world market for U.S. semiconductor firms an estimated 11 to 24 percent. Japanese semiconductor firms could no longer build volume in a protected home market and launch their export drives into world markets. Their semiconductor industry, like the U.S. and the European, would face significant foreign competition in the domestic market.

Overcapacity in the World Semiconductor Industry
and the Japanese Cost of Capital Advantage

The importance for the U.S. industry of obtaining a greater position in the Japanese market is increased because of the critical period for the U.S. industry that lies ahead. Over the next two years, as major consumer markets undergo inventory adjustments, capacity in the world semiconductor industry is projected to grow more rapidly than is projected demand. Despite this pressure, the Japanese semiconductor industry is continuing to add capacity at a rate which suggests that they believe they can dominate the world industry by the late 1980s.

In a dynamic industry like semiconductors, even though growth in demand has averaged 20 percent per year since 1970, there can be periods of mismatch between available capacity and demand. Unlike some industries, semiconductor process technology is continually, and rapidly evolving. One dramatic example is provided by the evolution of the size of the silicon wafers used in production. (Wafers are thin silicon disks on which hundreds of devices or chips are developed in a number of complex process steps.) The industry today has started to introduce six-inch diameter wafers into production, replacing four-inch diameter wafers, which just became the dominant wafer size in 1980, which in turn replaced three-inch diameter wafer technology. By the end of the decade, eight-inch diameter wafer process technology could begin to be installed. Each increase in wafer diameter generates significant gains in production productivity, as measured by the number of devices produced per employee.

Concurrently with the increase in wafer diameter, the industry is reducing the dimensions of the features of the

devices, putting more complexity into less area. Together with the larger wafer diameter these changes mean that each successive generation of installed semiconductor production capacity is several times as productive as the generations installed just three to five years previously.

As each advance in process technology occurs, the industry must continually upgrade its capacity in order to remain competitive. Because new plant and equipment investment adds large discrete units of incremental productive capacity, there can be periods when, despite significant demand growth, excess capacity is created. For example, in 1980 semiconductor demand grew by 30 percent over the preceding year, but capacity utilization fell by 15 percent because new four-inch wafer diameter and the advent of sub-six micron process technology, which permitted a designer to pack circuitry more densely onto a chip, expanded the available productive capacity even more rapidly.

In the 1985-1986 period, similar prospects of a significant gap between demand and capacity are emerging as the industry begins the move to six-inch wafer diameter, sub-two micron process technology. This period could be an especially difficult one because growth in demand is expected to be less than 10 percent during 1985 and remain below 20 percent in 1986.

This situation becomes even more critical for the U.S. industry, because during past periods when slow demand growth was combined with rapid increases in production capacity, the behavior of the Japanese industry has provided cause for concern. Since 1974 there have been two major periods of slow

growth in semiconductor demand. In each period, 1974-75 and 1981-82, Japanese semiconductor firms:

- o continued to expand capacity, regardless of the cash flow consequences; and
- o refused to curtail production and instead built excessive inventories through the slow demand period. This inventory was then forced onto the market through price-discounting when demand growth began to accelerate again.

Both practices lead to significant pressure on Japanese firms to drastically cut prices. One reason why Japanese firms can afford these practices is the lower cost of capital in Japan. In a sense they operate without a capital constraint which would normally cause them to delay plant and equipment expansion until recovery had set in and also to cut back production in order to keep inventories more in line with demand.

In the 1981-82 recession, the U.S. semiconductor industry responded to the capacity expansion pressures from Japan. Learning from the 1974-76 period, the U.S. industry, in order to maintain its market share, maintained its rate of capital spending right through the 1981-82 period -- despite the fact that it weakened the financial health of the industry.

1975 1976 1977 1978 1979 1980 1981 1982 1983 1984

A. Capital Spending to Sales-IC Producers

| | | | | | | | | | | |
|---------|----|----|----|----|----|----|----|----|----|-------|
| - Japan | 11 | 21 | 14 | 18 | 22 | 25 | 25 | 28 | 29 | 31(e) |
| - U.S. | 5 | 13 | 14 | 19 | 14 | 17 | 19 | 16 | 16 | 19(e) |

B. Net Profits to Sales-U.S. IC Producers

| | | | | | | | | | | |
|--|-----|---|---|---|---|---|---|---|---|------|
| | (1) | 5 | 6 | 7 | 8 | 8 | 3 | 1 | 6 | 7(e) |
|--|-----|---|---|---|---|---|---|---|---|------|

The prospects for 1985-86 for the U.S. semiconductor industry are unsettling, especially given the continuing expansion of capacity in Japan and the inability of U.S. semiconductor firms to obtain effective access in the Japanese market.

III. CONCLUSION

The inability of U.S. companies to sell semiconductors in the Japanese market at a level commensurate with their sales elsewhere in the world causes harm to the United States economy in two primary ways. On the most basic level, it costs U.S. semiconductor companies \$1.5 to \$3.3 billion in sales that they would make if they achieved a market share equal to their share of other world semiconductor markets. This translates into a loss of 17,000 to 27,000 U.S. jobs.

At the same time the fact that U.S. companies are not permitted to compete on an equal basis in Japan, and the structure of the Japanese semiconductor market, means that Japanese semiconductor companies are not bound by market constraints in terms of investment decisions. This has resulted in Japanese semiconductor companies creating capacity for which no known demand exists. This situation raises legitimate fears in the United States that, in order to sell their accumulated production, Japanese semiconductor companies may engage in trade practices which would be actionable under U.S. law.

If the U.S. semiconductor industry is to remain competitive over the long term, it is vitally important that U.S. semiconductor companies obtain access to the Japanese market. Japanese semiconductor companies are already building their world market share, and much of that growth is a direct result of their ability to rely on the presence of a secure home market in which to sell their products.

APPENDIX A : JAPAN'S HISTORY OF PROTECTION IN SEMICONDUCTORS

The semiconductor industry was one of several "infant" industries in the electronics field which the Japanese government sought to promote beginning in the 1960s through a combination of home market protection, subsidies, for R&D and investment, and government-directed industry rationalization programs.^{1/} Two Japanese scholars commented in 1984 that

The electronic industries in Japan are a typical example of the protectionist policies to promote infant industries... It can be concluded that government protection of the electronics industries has been tight and comprehensive.^{2/}

Japan's domestic semiconductor market was formally protected against imports and foreign investment until 1974-75. Imports were restricted by prior approval requirements and quotas. Semiconductors were placed on the "restriction list," meaning that semiconductor imports required a license.^{3/} Investment in semiconductors was restricted by placing the industry on the so-called "negative list" -- foreign majority ownership in such industries was not permitted without prior government approval,^{4/} which, in the case of semiconductors, was almost never granted.

These restrictions were reinforced by other measures. Japan's Ministry of International Trade and Industry jawboned semiconductor users to "buy Japanese."^{5/} The Japan Electronic Computer Company (JECC), a government-funded company which bought Japanese-made computers and leased them on favorable terms to users, was required by MITI to accept only computers which satisfied a local-content requirement, which was progressively tightened from 80 to 95 percent.^{6/} Because JECC accounted for a

-
- ^{1/} The entire panoply of promotional measures employed in this sector is detailed in SIA's 1983 study The Effect of Government Targeting on World Semiconductor Competition.
- ^{2/} S. Sekiguchi and T. Horiuchi, "Foreign Trade and Industrial Policies: a Review of Japanese Experience," in B.S. Kudrie, The Industrial Future of the Pacific Basin (1984) pp. 17, 19.
- ^{3/} Japan Economic Journal, July 29, 1969; September 1, 1970.
- ^{4/} See Japan Economic Journal, January 14, 1969.
- ^{5/} Nihon Keizai reported on December 24, 1974 that "MITI has up to now strongly urged the Japanese calculator makers to use national products."
- ^{6/} Japan Economic Journal, April 9, 1968.

large portion of Japan's computer sales, this requirement -- which forced domestic computer makers to primarily employ domestic components -- was a significant barrier to imports.

In one exceptional case, a U.S. company, Texas Instruments (TI), was able to establish a subsidiary in Japan, although only after a protracted effort which entailed, among other things, an agreement to share TI technology with Japanese companies. TI first applied to MITI in 1964 to establish a subsidiary in Japan. MITI's position was that the subsidiary must not be wholly owned by TI, but must be 50-50 U.S. and Japanese-owned; that TI must "liberalize" its patent rights; and that its production schedule must be the subject of restrictions imposed by MITI.^{7/} TI would not accept such terms, and negotiations continued through 1968; during this period the Japanese producers were able to achieve considerable technological gains relative to U.S. producers. The Japan Economic Journal commented on January 30, 1968 that

Texas Instruments had been seeking Japanese Government permission for four years since early 1964 on its plan to start a wholly owned IC [integrated circuit] enterprise in Japan.... The strong opposition to Texas Instruments' entry voiced by Japanese makers led the Ministry of International Trade Industry finally to specify three conditions for sanctioning its entry.... During the past four years since Texas Instruments' first approach to Japan, however, leading Japanese electric makers have striven to develop their own types of ICs.... The Japanese makers now have attained a high level of technology on IC manufacture, producing a considerable volume of ICs.

At length, Japanese firms, seeking to export computers, calculators and televisions containing Japanese-made ICs to the U.S., became concerned that in doing so they would be vulnerable to TI patent infringement action, and a compromise was reached.^{8/} TI was permitted to establish a joint venture with Sony (which it was permitted to buy out in 1972) but in return was required to license its patents to NEC, Toshiba, Hitachi, Sony and Mitsubishi, and to limit its level of production for sale in Japan. MITI used control of the TI know-how to limit entry into the semiconductor field by Japanese companies to strengthen "the international competitiveness of domestically

^{7/} Japan Economic Journal, October 31, 1967.

^{8/} Japan Economic Journal, September 12, 1967; April 23, 1968.

developed ICs.^{9/} TI was never able to achieve a major penetration of the Japanese market.

Other U.S. efforts to secure a foothold in the Japanese market during this period were less successful. Fairchild and National Semiconductor, for example, devised plans to establish subsidiaries on Okinawa prior to the island's reversion to Japanese sovereignty -- a "back door" way of entering the market. This plan caused considerable concern in Japan,^{10/} but was thwarted when MITI indicated that "it will be unable to approve the continued existence of the subsidiary company with 100% foreign capital after the reversion as it is."^{11/}

The Nixon administration mounted a major effort to induce Japan to liberalize imports of computers and computer parts (semiconductors) in 1971.^{12/} The Japanese initially resisted U.S. pressure, but eventually agreed to liberalization -- but over a phased period, designed to buy time for Japanese producers to enhance their level of development.^{13/} At the same time, the

9/ Japan Economic Journal, November 19, 1968.

10/ Nihon Keizai, March 27, 1971.

11/ Asahi, April 6, 1971.

12/ The Japanese government's imposition of quantitative restrictions on semiconductor imports contravened the General Agreement on Tariffs and Trade, to which Japan was a signatory. The Japan Economic Journal commented on July 29, 1969 that

Japan has been enforcing [such import restrictions] without the understanding of the General Agreement on Tariffs and Trade (GATT)

The U.S. government warned that it would bring a formal complaint under GATT if Japan did not agree to liberalize imports of computers and computer parts, including semiconductors. The Japanese responded that "the Japanese side will not change its established policy, even if the case is brought before GATT." (MITI Vice Minister Morozumi in Nikkan Kogyo, August 13, 1971.

13/ The Japanese magazine Technocrat commented in December 1975 (pp. 9-10) that "Although MITI drew up a schedule for capital liberalization in July 1971, it proposed measures for checking or blocking the entry of foreign capital such as 1) individual deliberation on the entry of foreign capital, 2) allotment of import quotas and 3) individual deliberation on the introduction of technology." Tokyo Shimbun reported on July 22, 1971 that "import liberalization has been most strongly demanded by the U.S. MITI holds, however, it is difficult for Japan to carry out import liberalization

FOOTNOTE CONTINUED

government instituted a series of "liberalization counter-measures" designed to offset the impact of liberalization.^{14/} The Japan Economic Journal reported on August 4, 1971 that the government had decided to agree to a phased liberalization of integrated circuits, computer parts, and computers. At the same time,

[T]he Government will establish a special account for financing countermeasures relative to computer decontrol and earmark a sum of 51 billion yen (approximately \$141.6 million) yearly over a three year period, starting from the next fiscal year, as a subsidy for promoting as well as reorganizing the industry's structure.

Under the Japanese program, "liberalization" of semiconductor imports was phased in stages between 1971 and 1974, with the least complex products liberalized first;^{15/} investment was liberalized in 1974-75 (Figure A1).^{16/} A speedier liberalization timetable was resisted by some Japanese semiconductor producers; in 1972 Nihon Kogyo reported that the semiconductor makers were warning that

If the complete liberalization were to take place at this juncture, we will be wiped out in the fields where we can expect future demands for IC, such as automobile, watch, and electronic products. With the lowering of the

covering the main body of computer, parts, and integrated circuits (ICs) in view of a serious gap in strength between Japanese and American manufacturers of these items."

- ^{14/} On July 13, 1971 Asahi summarized a MITI policy statement on liberalization: "In the future, the import restriction system, the restrictions on the induction of foreign capital and the lowering of tariffs will be handled with great care, carefully ascertaining the actual state of the competitive power of the manufacturers concerned, future strengthening of competitive power, and the effects of measures to be carried out to aid these moves."
- ^{15/} Liberalization of ICs with under 100 elements occurred in September 1970. Import of ICs with under 200 elements was liberalized in April 1973. Import of ICs with 200 or more elements was liberalized in December 1974. Nihon Keizai, March 27, 1971; Japan Economic Journal, September 1, 1970; Japan Information Processing Development Corporation (JIPDEC) Computer White Paper (1977), p. 12.
- ^{16/} Investment in ICs (excluding ICs for computers) was liberalized in 1974; investment in ICs for computers was liberalized in 1975. JIPDEC Computer White Paper (1977), p. 12.

FIGURE A1

TIMETABLE FOR LIBERALIZATION OF THE JAPANESE INFORMATION INDUSTRY

| Product | % of Liberalization | | Liberalization of Imports |
|---|----------------------------|----------------------------|------------------------------|
| | 50% | 100% | |
| Electronic Accounting Machines, High-Performance Calculators, etc. | Aug. 4, 1974 | Dec. 1, 1975 | Apr. 19, 1973 |
| Computers | | | |
| Main Units | Aug. 4, 1974 ^{1/} | Dec. 1, 1975 ^{1/} | 1975 |
| Peripheral Equipment | | | |
| Memory Units, Terminal Devices | Aug. 4, 1974 ^{1/} | Dec. 1, 1975 ^{1/} | 1975 |
| Other | Aug. 4, 1974 ^{1/} | Dec. 1, 1975 ^{1/} | Feb. 1, 1972 |
| Parts | Aug. 4, 1974 ^{1/} | Dec. 1, 1975 ^{1/} | 1975 |
| Software | Dec. 1, 1974 | Apr. 1, 1976 | |
| ICs | | | |
| Under 100 Elements | Liberalized ^{2/} | Dec. 1, 1974 ^{2/} | September, 1970 |
| Under 200 Elements | Liberalized ^{2/} | Dec. 1, 1974 ^{2/} | Apr. 19, 1973 |
| 200 or More Elements | Liberalized ^{2/} | Dec. 1, 1974 ^{2/} | Dec. 25, 1974 |

^{1/} Including ICs for Computers^{2/} Excluding ICs for ComputersSource: JIPDEC Computer White Paper, 1977

tariff rate and the revaluing up of the yen, U.S. IC makers' offensive against Japan is expected to become fiercer. For the domestic industry which is already suffering from a loss, the idea of complete liberalization cannot be accepted.^{17/}

At the same time, an intensive industry-government effort was under way to upgrade the semiconductor industry while the protective mechanisms were still in place. Formal government protective measures were credited with making possible the Japanese industry's rapid growth during this period.^{18/} As NEC's Executive Director Hattori explained in 1974,

Looking back, it is quite clear that in the past, Japanese minicomputer makers have relied on American ICs, and MITI gave administrative guidance, putting these things on the negative list. I think it was only then that the domestic industry was able to say to themselves, 'now we can consider capital investment, and they were able to take the first step, because the demand was stabilized. If MITI had not placed them on the negative list, the computer market would have been taken over willy-nilly by America. In short, unless there is some foundation, some backing, no one will have courage to do so. It would be so risky. This is the number one point. And if ICs for minicomputers were not placed on the negative list, capital investment would not have been possible by Japanese makers. 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.^{19/}

17/ Nihon Kogyo, October 30, 1972.

18/ The Japan Economic Journal observed on October 22, 1974 that

The Japanese IC industry has recorded a spectacular growth in the recent few years owing to the following two factors: 1) active demands from manufacturers of desktop electronic calculators, and 2) import controls exercised by the Ministry of International Trade and Industry.

(As noted, MITI "strongly urged" the calculator makers to use national products).

19/ Nikkan Kogyo, December 12, 1974.

Recognizing the importance of protection, on the eve of the liberalization of imports of ICs with over 200 elements, the Japanese semiconductor makers requested that MITI continue to exercise administrative guidance after liberalization to ensure that local consumers continued to favor Japan-made products. In December 1974 the Japan Electronics Industry Association submitted a list of requests to MITI which included the following:

In view of the fact that the demand for ICs is growing rapidly, not only in the electronics industry, but in the automobile, watch, camera and other new fields, 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.^{20/}

In 1975-76, when Japan liberalized investment in computers and integrated circuits for computers, the last formal barriers to foreign semiconductors were removed. At the same time, however, the Japanese government urged "local public organizations, financial organs, power industries, and educational institutions" to buy national products "to protect the Japanese computer industry from any sudden decrease in share due to full liberalization."

[If a Japanese model is on an equal level with a foreign model] the Japanese model should be selected.^{21/}

The last phase of formal liberalization was accompanied by a series of "liberalization countermeasures" designed to offset its

^{20/} Nikkan Kogyo, December 21, 1974. Other requests included monitoring of import prices, possible imposition of emergency tariffs, and financial aid "for capital for technological development and the improvement of production plant, and for rationalization." Ibid.

^{21/} Letter from MITI Minister Komoto to various organizations, March 10, 1976, reported in Denki March 11, 1976. Komoto stated in an "informal talk" on December 19, 1975 that

The Ministry has made it known that it will watch the trends of importation and installation of the electronic computer in our country, and powerfully deploy various promotional measures such as promoting development of super LSI for the next generation of electronic computers.

Monthly Report of the Electronics Industry, January 1976.

FIGURE A2

**U.S. COMMERCIAL MERCHANT SEMICONDUCTOR SALES IN JAPAN
AS A PERCENTAGE OF JAPANESE DOMESTIC SEMICONDUCTOR CONSUMPTION**

| <u>Year</u> | <u>Yen/ Dollar</u> | <u>U.S. Share Integrated Circuits (%)</u> | <u>U.S. Share Discrete/ Optical (%)</u> | <u>U.S. Share Total Semiconductors (%)</u> |
|-------------|------------------------|---|---|--|
| 1973 | 268.7 | 16.9 | 3.8 | 8.9 |
| 1974 | 291.8 | 17.3 | 4.1 | 10.0 |
| 1975 | 296.9 | 17.1 | 3.8 | 10.5 |
| 1976 | 296.2 | 15.7 | 5.2 | 10.5 |
| 1977 | 265.9 | 14.6 | 3.7 | 9.1 |
| 1978 | 205.9 | 15.5 | 3.6 | 10.4 |
| 1979 | 221.3 | 19.8 | 5.4 | 14.5 |
| 1980 | 224.8 | 15.8 | 5.1 | 12.2 |
| 1981 | 221.3 | 11.8 | 4.5 | 9.3 |

Notes: Japanese Consumption = Merchant and Captive

U.S. Sales = Merchant Only

U.S. sales include totals for U.S. firms wherever located, estimated TI total sales in Japan (imports and local manufacture).

Source: Dataquest, SIA Estimates

impact. The most significant countermeasure was the launching of a massive, subsidized industry-government effort to enhance Japanese capability in Very Large Scale Integration (VLSI).^{22/} Thus, on the eve of the final round of liberalization, the Japan Economic Journal reported (November 18, 1975) that the leading Japanese semiconductor/computer producers

[D]o not seem to be feeling much of a tangible threat from [liberalization] although some have some misgivings about what might happen. Behind their self-confidence is the fact that they have successfully prepared themselves for the total exposure to international competition.... Another encouraging thing is the program for development of ultra LSI to be launched next fiscal year with subsidy from the Ministry of International Trade & Industry...

U.S. firms' penetration of the Japanese semiconductor market did not increase significantly following "formal liberalization" of the market in fact, U.S. share of Japanese consumption in the post-liberalization era (generally around 10-11 percent) remained virtually the same as the U.S. share when the market was formally protected (Figure A2). Moreover, the U.S. share began declining in 1980, and in 1982, was lower than the U.S. share in 1974, the last year the market was protected by quotas. The U.S. share did not increase substantially through 1982 despite the opening of numerous U.S. subsidiaries in Japan, substantial yen appreciation against the dollar, and additional "liberalization" measures. The U.S. share of Japanese consumption stood in sharp contrast to the U.S. share of all other major world markets. In 1982, when U.S. firms held a 55.5% share of the world market, their share of Japanese sales was only 9.7%.

A. Market Structure

The continued resistance of the Japanese market to imports after liberalization reflects the fact that the Japanese semiconductor market is structured in a way that gives Japanese producers substantial control over demand. As a number of Japanese firms observed in a 1982 advertisement in Scientific American,

^{22/} The VLSI project is described in SIA's The Effect of Government Targeting, *op. cit.*, Appendix A. Two government entities, MITI and Nippon Telephone and Telegraph, spearheaded this project. The NTT phase of the project resulted, among other things, in the development and commercialization of 64K and 256K Random Access Memories, product lines in which Japanese firms today dominate the world market. Nikkei Sangyo, February 8, 1980; Japan Telecommunications Review, January 1979.

FIGURE A3

CONSUMPTION OF INTEGRATED CIRCUITS IN JAPAN

| Market Segment | 1980 Percentage of Total Usage ^{1/} |
|--|---|
| TV Sets, VTRs | 14.1 |
| Audio Equipment | 16.9 |
| Calculators/Watches | 16.9 |
| Other Consumer Products | 8.5 |
| Computers | 15.5 |
| Communications | 8.5 |
| Other Information Industry and Industrial Use | 19.7 |
| TOTAL | 100.1 ^{2/} |

^{1/} Usage of ICs as a percent of the value of consumption

^{2/} Shares exceed 100% due to rounding

Source: BA Asia Ltd., The Japanese Semiconductor Industry 1981/82

FIGURE A4

LEADING JAPANESE PRODUCERS OF PRODUCTS UTILIZING SEMICONDUCTORS

(CY 1980 except where noted)

| Information Industry | | | | Consumer Products | | | |
|--|----------------------------|---------------------------------------|----------------------------|--------------------------|-------------------|--|-------------------|
| <u>Computers (FY 1981)</u> | | <u>Electronic Telephone Exchanges</u> | | <u>Color TV</u> | | <u>Radio/Cassette Tape Recorders (FY 1980)</u> | |
| <u>Firm</u> | <u>Total Sales</u> | <u>Firm</u> | <u>Domestic Production</u> | <u>Firm</u> | <u>Production</u> | <u>Firm</u> | <u>Production</u> |
| *Fujitsu | 26 | *NEC | 67.0 | *Matsushita | 27.9 | *Matsushita | 18.0 |
| *Hitachi | 17 | *Fujitsu | 39.5 | JVC | 21.0 | *Sony | 17.5 |
| *NEC | 16 | *Oki | 8.5 | *Sony | 20.9 | *Sony | 12.5 |
| *Toshiba | 6 | *Hitachi | 5.0 | *Hitachi | 7.8 | *Sharp | 11.0 |
| *Oki | 5 | | | *Sanyo | 7.8 | *Toshiba | 9.0 |
| Nippon Univac | 3 | Semiconductor | | Semiconductor | | Semiconductor | |
| Semiconductor | | Producers % Share | 100.0 | Producers % Share | 63.6 | Producers % Share | 68.0 |
| Producers % Share | 70 | | | | | | |
| <u>Word Processors (Japanese Language)</u> | | <u>Personal Computers</u> | | <u>Stereos (FY 1980)</u> | | <u>Microwave Ovens</u> | |
| <u>Firm</u> | <u>Domestic Production</u> | <u>Firm</u> | <u>Domestic Production</u> | <u>Firm</u> | <u>Production</u> | <u>Firm</u> | <u>Production</u> |
| *Toshiba | 88.0 | *NEC | 41.1 | *Pioneer | 19.0 | *Matsushita | 30.0 |
| *Sharp | 37.0 | *Sharp | 37.0 | *Matsushita | 17.0 | *Sharp | 18.0 |
| *Oki | 10.0 | *Oki | 10.0 | *Sony | 12.5 | *Toshiba | 16.5 |
| *Fujitsu | 5.0 | *Fujitsu | 5.0 | JVC | 8.0 | *Sanyo | 12.0 |
| | | | | *Hitachi | 6.0 | *Hitachi | 9.0 |
| Semiconductor | | Semiconductor | | Semiconductor | | Semiconductor | |
| Producers % Share | 100.0 | Producers % Share | 93.1 | Producers % Share | 54.5 | Producers % Share | 83.5 |
| | | | | | | | |
| | | | | <u>Home VTR</u> | | | |
| | | | | <u>Firm</u> | <u>Production</u> | | |
| | | | | *Matsushita | 27.9 | | |
| | | | | JVC | 21.0 | | |
| | | | | *Sony | 20.9 | | |
| | | | | *Hitachi | 7.8 | | |
| | | | | *Sanyo | 7.8 | | |
| | | | | Semiconductor | | | |
| | | | | Producers % Share | 63.6 | | |

* Producer of Semiconductors

Sources: BA Asia Ltd., The Japanese Semiconductor Industry 1981/82, p. 46

The fact that many Japanese firms that are large [semiconductor] consumers are also large producers makes the Japanese market more difficult to penetrate.^{23/}

In fact, the same firms that produce most of Japan's integrated circuits also account for a majority of Japan's semiconductor consumption. Figure A3 depicts an estimate of total semiconductor consumption in the Japanese market in 1980. As can be seen, consumer electronics products account for 56 percent of semiconductor consumption; the information industry and other industrial users account for the rest. Figure A4 depicts the leading Japanese producers of consumer electronics and information industry products in 1980. In most cases, at least two thirds of the total production of these products was attributable to the same firms that produced most of Japan's semiconductors. In some end-product lines, such as electronic telephone exchanges and word processors, all domestic production was accounted for by Japanese semiconductor producers.^{24/}

The Japanese producer-consumer firms are not simply captive. Instead, each firm tends to specialize in a comparatively narrow product range, selling its own devices to other firms and procuring devices which it does not produce (or produces in small quantities) from other Japanese makers.^{25/} (In some key product lines, such as Random Access Memories, all major producers participate). Such division of labor improves scale

23/ Advertisement placed by 15 Japanese firms (including Toshiba, Matsushita and Sony) in Scientific American, October, 1982.

24/ SIA, The Effect of Government Targeting on World Semiconductor Competition (1983), pp. 75-77.

25/ The Effect of Government Targeting, op. cit., pp. 76-78; BA Asia, Ltd., The Japanese Semiconductor Industry 1981/82, pp. 299, 318, 328; BA Asia 1980 p. 133; Nihon Keizai, March 30, 1981; Japan Economic Journal, April 14, 1981. The need for this type of interfirm specialization in the semiconductor industry has been a theme stressed by MITI and the industry for years. In 1967, when the industry was in its infancy MITI advised Japanese manufacturers "to consider joint IC production as individual efforts to build production facilities are likely to prove in many cases wasteful as well as costly." Japan Economic Journal, August 3, 1967. In 1971 the Japan Electronics Industry Association announced the formation of a cartel for IC production "which will have a maker producing a type of IC product at the lowest cost and undertake commissioned production for the others." Japan Economic Journal, December 14, 1971. A number of interfirm tie-ups involving such "division of labor" were reported during this period. Nihon Kogyo, February 19, 1974; Japan Economic Journal, January 19, February 23, 1971; JULY 1, 1975.

and learning economies, but it also gives the Japanese producer-consumers the ability to exclude imports through tacit or overt collusion. In fact, these firms have long regarded "division of labor" with respect to production as a means of responding to import competition.^{26/}

B. Import Displacement

U.S. firms have repeatedly encountered the phenomenon of "import displacement" in Japan -- that is, they are able to achieve some penetration of the Japanese market with a particular product so long as sufficient quantities of a competing Japanese product are not available, but as soon as Japanese firms can supply the product (at times simply a copy of the U.S. device), U.S. firms' sales drop sharply, frequently to zero. A number of SIA's member companies reported in 1983 that their only significant sales in Japan, nearly a decade after liberalization of the market, were of products the Japanese did not yet make themselves.

The Japanese at one time practiced import displacement openly, as a policy.^{27/} Japan now contends that this practice has ceased, but the empirical experience of U.S. semiconductor firms suggests otherwise.

26/ On the eve of import liberalization in 1974, Nihon Keizai reported (December 12) that

[T]he onslaught of foreign capital that accompanies liberalization has made it necessary for counteraction, and it is anticipated that the makers will mutually adjust their production area responsibilities and strive to increase their production.

27/ On May 4, 1971, the Japan Economic Journal reported that

[T]he Ministry of International Trade and Industry was opposed to such imports of LSIs and was now studying ways for restricting them, such as by limiting their quantity or shortening their import time. This is because though it so far has been allowing virtually all imports, it hopes to clamp strong restrictions on them when the Japanese makers become fully capable of producing their own LSIs.

In March 1975, JEI, the Journal of the Vapan Electronics Industry Association, indicated that

In the past, the import of overseas ICs was checked when similar ICs were domestically manufactured.

In 1982-83, SIA documented several specific instances of import displacement in the Japanese market in its study of Japanese targeting policies.^{28/} Figure A5 depicts the results of one of these case studies, showing sales in Japan of bipolar PROMs by a major U.S. producer ("Firm XX") between calendar 1979 and 1981. In 1979, Firm XX enjoyed relatively stable sales of slightly over \$1.2 million per quarter in this product line. However, in late 1979 and early 1980 Fujitsu introduced its own line of bipolar PROMs. Following a brief 3-6 month interval, during which Japanese designers analyzed and converted to the Fujitsu PROM, the U.S. firm's sales began to fall off sharply as Japanese buyers converted to the Fujitsu PROM on an as-available basis. In the 12 months between the second quarter of 1980 and the second quarter of 1981, quarterly sales dropped from just under \$1.3 million to approximately \$0.2 million.

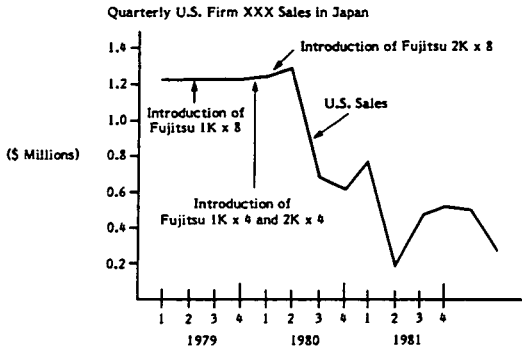
Figures A6, A7 and A8 depict the results of another SIA case study, which examined the experience of three U.S. firms with respect to the 8080 microprocessor. U.S. firms began selling this product in Japan in the early 1970s. NEC began producing small numbers of 8080s in 1975, but in 1978-79, it increased its output substantially (Figure A8). In mid-1979, the market for U.S.-made 8080 microprocessors in Japan virtually disappeared. As Figure A6 indicates, net bookings for this product dropped suddenly to negative figures, reflecting cancellation of earlier orders as well as a loss of new bookings. Subsequent bookings and a reduction in backlog have been virtually nil. Meanwhile, in 1980, at the same time that the Japanese market for the U.S. 8080 had disappeared, NEC substantially increased its own production -- in effect, taking over the market from the U.S. firms. (See Figure A8). The U.S. firms' 8080 experience in Japan should be contrasted with the same three firms' experience in the world market, where sales tapered off gradually as the life cycle of the product came to an end and a new generation of microprocessors reached significant volume in the world marketplace (Figure A7).

It is not clear what actually caused the sudden disappearance of U.S. firms' 8080 market. If Japanese 8080 quality were superior, seemingly some significant displacement of U.S. firms by the Japanese should have occurred sooner, since the Japanese 8080 was on the market several years prior to the 1979 displacement. Japanese firms should not have been able to underprice U.S. firms because they had been in the market for a shorter time and had produced lower volumes, so that U.S. firms' costs were presumably lower than those of Japanese firms. The evidence strongly suggests that "buy Japan" propensities on the part of Japanese users were at least partly responsible for the disappearance of the U.S. 8080 market. It appears that when NEC had built up sufficient capacity to supply the entire market, Japanese users quickly switched to the Japanese product.

^{28/} The Effect of Government Targeting, op. cit.

FIGURE A5

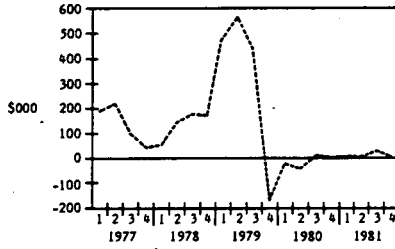
BIPOLAR PROM SALES IN JAPAN BY U.S. SEMICONDUCTOR FIRM XXX



Source: Company Estimates

Figure A6

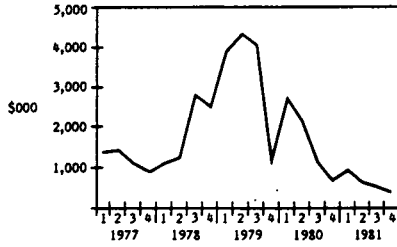
ESTIMATED UNITED STATES BOOKINGS OF
8080-TYPE MICROPROCESSORS TO JAPANESE MARKETS



Source: Company Estimates

Figure A7

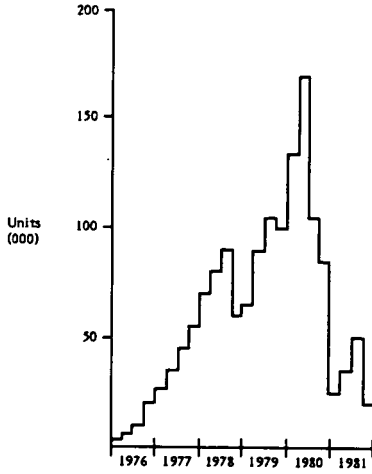
ESTIMATED UNITED STATES BOOKINGS OF
8080-TYPE MICROPROCESSORS TO WORLD MARKETS



Source: Company Estimates

FIGURE A8

JAPANESE PRODUCTION OF 8080 MICROPROCESSORS BY QUARTER



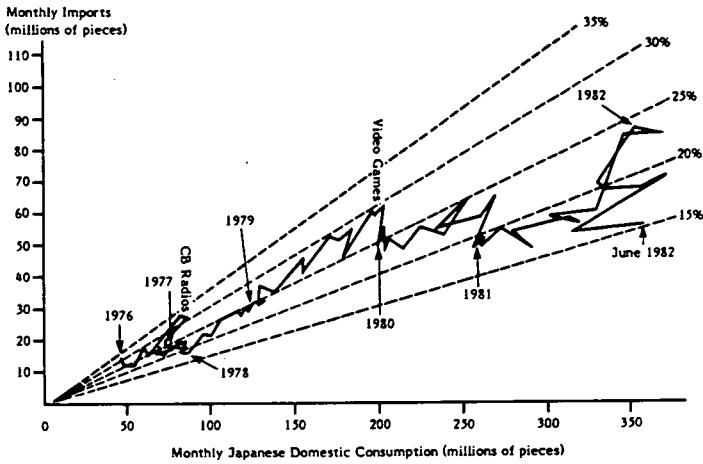
Source: Dataquest

In the experience of U.S. firms, the 8080 and Bipolar PROM stories are the norm, rather than the exception, in Japan. The historical monthly pattern of integrated circuit imports (from all nations) as a percent of Japanese consumption tends to corroborate the picture of import displacement in Japan. In Figure A9, the jagged line depicts, on a monthly basis, total imports of integrated circuits (all countries, not just the U.S.) as a percentage of Japanese domestic consumption, through 1982.^{29/} As can be seen, there are a number of sharp "peaks" in import share, where the import percentage approaches or exceeds 30 percent, followed by subsequent sharp drops. The first two "peaks" (1976 and 1979) were led by a surge in Japanese demand for components for CB radios (1976) and video games (1980). Imports appear to have met this demand, but only temporarily in response to a shortage. The demand for imports declined quickly after an initial surge, not only in percentage terms but in an absolute sense.

^{29/} Integrated circuits are a major subcategory of semiconductors.

FIGURE A9

**MONTHLY JAPANESE INTEGRATED CIRCUIT IMPORTS
AS A PERCENTAGE OF DOMESTIC CONSUMPTION, 1976-82**



Source: U.S. Industry Source, Compiled from MITI and JETRO Figures

APPENDIX B: DOES THE YEN/DOLLAR SITUATION
AFFECT SEMICONDUCTOR TRADE?

Unlike some U.S. industries, the shifting yen/dollar relationship is not a major factor in determining the competitiveness of the U.S. semiconductor industry. This is true for two primary reasons. First, learning effects are large and dominate over time the prices of devices. Second, the Japanese semiconductor market is not especially price elastic, i.e. price sensitive, though the yen/dollar valuation changes can have adverse consequences on profits from sales in Japan. Price is a more important factor in the U.S. market due to its more open, more competitive structure and thus the appreciation of the dollar has assisted Japanese penetration of the U.S. semiconductor market.

Since June, 1980, the yen has depreciated about 20 percent with respect to the dollar; over a shorter period, January 1982 - March 1985, the depreciation has been 11 percent. Adjusting for relative rates of inflation, the real effective exchange rate showed a yen depreciation of 15 percent between 1979 and 1984, but there has been virtually no change in the real effective exchange rate since 1982. Semiconductor product prices measured in terms of price per unit of performance show a continuing decline far larger than that of movements in the yen/dollar exchange rate. To illustrate, memory prices, measured in terms of price per bit, have fallen, on average, 20 percent per year since 1979 -- if the price per bit is normalized to 1 in 1979, it would equal 0.3 by 1984 -- a 70 percent decline. Thus building a large market which yields large learning economies or cost declines is an important factor in influencing price competitiveness.

Profit margins have been adversely affected by the appreciation of the dollar relative to the yen for U.S. products which compete directly with Japanese products. As the dollar appreciates against the yen, firms must squeeze their profit margins to offset the movement in exchange rates. The decline in the yen since 1982 has squeezed average gross profit margins of U.S. firms by about 20 percent.

GLOBAL PRODUCTIVITY

PUBLIC POLICY ISSUES FOR 1985

The Semiconductor Industry as Catalyst for
America's Manufacturing Competitiveness

March 11, 1985

SEMICONDUCTOR INDUSTRY ASSOCIATION
1985 PUBLIC POLICY AGENDA

o **R&D TAX CREDIT**

The R&D Tax Credit, which provides a 25 percent tax credit for R&D expenditures which exceed prior years' levels, is due to expire at the end of 1985. The R&D credit has encouraged the technological development so essential to economic growth. SIA strongly supports the High Technology Research and Scientific Education Act (S. 58 and H.R. 1188; list of cosponsors to be attached for use during the Washington Conference) which would make the R&D credit a permanent part of the tax code. SIA also endorses the bill's provisions that would expand credits for company contributions to university basic research and enhance the deduction for corporate donations of scientific equipment to post-secondary institutions.

o **TRADE NEGOTIATING OBJECTIVES**

SIA is a strong supporter of free international trade. On March 1, 1985, the U.S. and Japan, with the support of the SIA, eliminated their import duties on semiconductors. However, this free trade step will only be significant if the Japanese Government affirmatively acts to bring U.S. and Japanese sales opportunities for all semiconductor products into balance in the respective markets, preferably through an expansion of U.S. participation in the Japanese market.

SIA supports President Reagan's call in his State of the Union Address for the initiation of multilateral high technology negotiations in the General Agreement on Tariffs and Trade. These negotiations should address freedom of merchandise flows, freedom of investment, intellectual property issues, and the free flow of technology among GATT members.

o **EXPORT CONTROL**

SIA, while supporting measures to strengthen national security, opposes measures that unnecessarily restrict exports and raise costs. SIA strongly supports the Comprehensive Operations License (COL) provisions found in the current versions of the Export Administration Act Reform bill. The COL is designed to facilitate intra-company transfers of high technology between Western bloc nations through generalized two-year licenses rather than individual transaction licenses.

o **SEMICONDUCTOR CHIP PROTECTION**

Last year, the Congress passed the Semiconductor Chip Protection Act offering, for the first time, clear legal remedies against unauthorized copying of semiconductor chip designs. The unauthorized copying of chip designs is a deterrent to continued innovation in semiconductor products. The U.S. Government should encourage other countries to follow the lead of the United States and pass semiconductor design protection laws, and should work towards international agreements protecting chip designs, software and other forms of high technology intellectual property.

SEMICONDUCTOR INDUSTRY ASSOCIATION
1985 PUBLIC POLICY AGENDA

| | |
|-----------------------------|-------|
| Public Policy Overview | Tab 1 |
| Tax Policy | Tab 2 |
| Trade Policy | Tab 3 |
| Export Control | Tab 4 |
| Innovation and Productivity | Tab 5 |

PUBLIC POLICY OVERVIEW

Introduction

"Americans must take on the challenge of competitiveness as the economic agenda for the next decade." -- The President's Commission on Industrial Competitiveness.

The national challenges facing the U.S. semiconductor industry are a microcosm of the issues facing other American high technology industries, industries which are increasingly regarded as critical to overall economic growth and manufacturing productivity.

This paper presents the Semiconductor Industry Association's (SIA's) perspective on the public policy initiatives necessary in 1985 to retain U.S. competitiveness in semiconductors as part of an overall plan to restore America's industrial competitiveness. The priority issues for 1985 involve policies that address international trade and global market access, the structure of the U.S. tax system and the cost of capital, and protecting national security without excessive controls on exports or on the transfer of technology.

SIA's overall range goals have been well expressed in the Report of the President's Commission on Industrial Competitiveness released in January 1985. Hewlett-Packard President John Young chaired the Commission which concluded that the United States can meet the challenge of international competitiveness in four ways:

- Create, apply and protect technology;
- Reduce the cost of capital to American industry;
- Develop a more skilled, flexible, and motivated workforce;
- Make trade a national priority.

This paper presents an overview of the position of the semiconductor industry in the U.S. economy, and the major public policy issues which the industry believes the U.S. Government should address. The other four papers of the series address the following specific high technology public policy issues in greater depth: trade policy, tax structure, export controls and innovation and productivity.

SEMICONDUCTOR INDUSTRY ASSOCIATION MEMBER COMPANY LIST

The SIA represents fifty-seven manufacturers of semiconductors who together produce over 95% of all semiconductors fabricated in the United States each year.

SIA CORPORATE DESCRIPTIONDIVISION, DEPARTMENT OR SUBSIDIARY

| | |
|--|--|
| Advanced Micro Devices | Electronic Components |
| AT&T Technologies | Microcomponents Organization |
| Burroughs Corporation | |
| California Devices | |
| Cherry Semiconductor | Subsidiary of Cherry Elec. Prod. Corp. |
| Control Data Corporation | Microcircuits/Printed Circuits Div. |
| Digital Equipment Corporation | LSI Semiconductor Group |
| Exar Corporation | Subsidiary of BORN Company, LTD. |
| GE Intersil | Subsidiary of General Electric Co. |
| General Electric Company | Semiconductor Product Department |
| General Instrument Corporation | Discrete Semiconductor Division |
| General Instrument Corporation | Microelectronics Group |
| General Instrument Corporation | Optoelectronics Division |
| General Semiconductor Industries, Inc. | Subsidiary of Square D Company |
| Gould AHI Semiconductors | Subsidiary of Gould, Inc. |
| GTE Microcircuits | GTE Communications Products Corp. Div. |
| Harris Corporation | Semiconductor Sector |
| Hewlett-Packard | Computer IC Division |
| IBM Corporation | |
| Integrated Device Technology, Inc. | |
| Intel Corporation | |
| International Microelectronic Products | |
| International Rectifier Corporation | Semiconductor Division |
| ITT Semiconductors Worldwide | ITT Corporation Division |
| Lambda S/C Div. of Power Monolithics | Subsidiary of Veeco Instruments |
| Linear Technology | |
| LSI Logic Corporation | |
| Microwave Semiconductor Corporation | Subsidiary of Siemens |
| Monolithic Memories, Inc. | |
| Mostek Corporation | |
| Motorola, Inc. | Subsidiary of United Technologies |
| NCR Corporation | Semiconductor Products Sector |
| NEC Electronics USA, Inc. | Microelectronics Division |
| National Semiconductor Corporation | Subsidiary of NEC Corporation |
| Northern Telecom | |
| Precision Monolithics, Inc. | Electronics Subsidiary |
| RCA Corporation | Subsidiary of Bourns, Inc. |
| Raytheon Company | Solid State Division |
| Rockwell International | Semiconductor Division |
| Siemens Corporation | Electronic Devices Division |
| Siemens Corporation | Iselin Special Products Division |
| Siemens Corporation | Colorado Division |
| Siemens Corporation | Litronix Division |
| Siemens Corporation | Optoelectronics Division |
| Sigmatix Corporation | |
| Silicon Systems, Inc. | |
| Solid State Scientific | |
| Sperry Corporation | Sperry Computer System |
| Sprague Electric Company | Subsidiary of Penncentral Corporation |
| Symtek, Inc. | Subsidiary of Honeywell |
| Teledyne Semiconductors, Inc. | Teledyne, Inc. Division |
| Texas Instruments | Semiconductor Group |
| Thomson-CSF Components Corporation | Semiconductor Division |
| Unitrode Corporation | |
| VLSI Technology, Inc. | |
| Westinghouse Electric Company | Semiconductor Division |
| Zilog Corporation | |
| ZYMOS Corporation | |

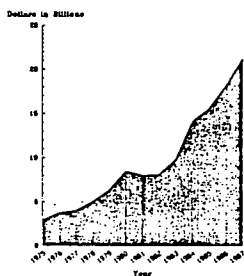
THE UNITED STATES SEMICONDUCTOR INDUSTRY

"The world semiconductor industry supports, and in many cases makes possible, an approximately \$200 billion world electronics market [and] before the end of this decade... will support a world high technology market of over \$500 billion." -- John T. Hickey, Senior Vice President and Chief Financial Officer, Motorola, Inc. before the House of Representatives Committee on Ways and Means, Subcommittee on Oversight, August 3, 1984.

The semiconductor industry is emerging as one of the truly basic industries of the United States in the sense that actions which affect it will exert a leveraged, or multiplied effect on a wide range of other industries. For this reason, government attention is increasingly focused on the semiconductor industry as one which is not only indicative of the state of the economy in general, but to a large extent, is determinative of future economic growth.

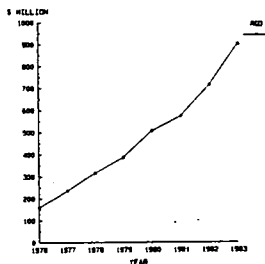
During 1984, the U.S. semiconductor industry achieved sales of \$14 billion, \$9.5 billion in the domestic market and the balance abroad, and the industry is forecast to reach \$21 billion in sales by 1987. The size of the industry and its rate of growth certainly make it important to the U.S. economy, but because semiconductors are an essential component in a growing range of other products, the industry takes on an economic importance far greater than its size alone would indicate.

**WORLDWIDE SHIPMENTS
U.S.-BASED SEMICONDUCTOR COMPANIES**



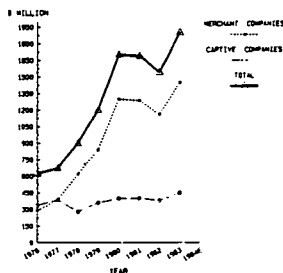
Source: SIA, World Semiconductor Trade Statistics program

**INTEGRATED CIRCUIT R&D EXPENDITURES
BY UNITED STATES SEMICONDUCTOR PRODUCERS**



Source: Strategy, Inc.; John Economic Journal; The Japanese Semiconductor Industry 1981/82; Dr. Hiroshi S. SIA annual financial survey.

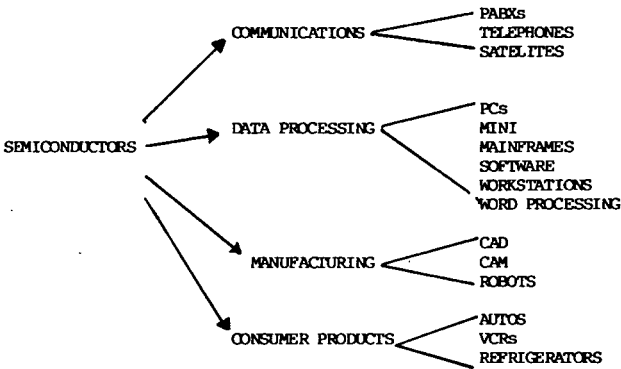
**CAPITAL INVESTMENT
BY UNITED STATES SEMICONDUCTOR PRODUCERS**



Source: U.S. Information from Commission on the Semiconductor Industry (1976-1978) SIA documents (1979-1984)

To a very large extent, the unparalleled rate of growth achieved by the United States electronics industry since World War II has been due to the development of the semiconductor. As a result of accelerating R&D and investment expenditures, semiconductors have become consistently smaller, more energy efficient, more powerful, and less expensive. As a result, the development of the semiconductor has been responsible for the creation of a large number of new electronics products -- even the development of new industries such as the computer and aerospace industries. Personal computers, calculators, word processors, video games and digital watches are but a few of the products which would not exist, or would be produced in much smaller quantities were it not for the rapid development of the semiconductor.

SEMICONDUCTOR LEVERAGE



Semiconductors have also had a significant impact beyond the electronics sector. According to Dataquest, Inc. the average semiconductor content in new automobiles will double from \$51 in 1983 to \$105 in 1989. The semiconductor products will be utilized in ignition, fuel control, spark timing and braking functions as well as for driver information displays, and body electronics (such as climate control, memory seat adjustments, and keyless entry). In addition, such products as ovens, telephones, radios, television sets and washing machines all

contain semiconductors in increasing numbers and as a result are able to perform more functions more efficiently than ever before, and frequently at a lower price.

By reducing production costs and increasing product quality, the semiconductor can play a major role in keeping American products competitive on world markets. In addition, the use of semiconductors in place of circuitry which requires extensive manual assembly has enabled U.S. businesses to relocate production facilities back to the United States. General Motors Corporation's Delco Electronics Division, for instance, decided in 1983 to move the manufacturing facilities for 85 percent to 90 percent of its automobile radios from Mexico and Singapore to the United States because they can now be assembled using semiconductors and as a result can be assembled in a cost-effective, competitive manner in the United States.

"(B)eginning in 1983-84, the relative importance of overseas production (of U.S. semiconductor manufacturers) declined with the location of new, highly-automated facilities within the United States itself. The resulting productivity gains should improve the competitiveness of American semiconductors both at home and abroad." -- Department of Commerce, 1985 U.S. Industrial Outlook (January 1985).

Semiconductors also increase productivity by automating labor intensive tasks that might otherwise be done overseas. Textile factories, steel mills, and dairy farms now all draw upon automated semiconductor-based machinery to operate more efficiently. As these industries seek to meet the challenges of international competition, this improved productivity can make the difference between a successful and an unsuccessful venture. Given differential labor rates, the use of advanced semiconductor technology is the only way in which many industries can continue to manufacture competitively in the United States.

Finally, the fast growing services sector of the economy is dependent on high speed, semiconductor driven computers and telecommunication equipment. The competitiveness of the financial services sector, for example, rests on its ability to manipulate financial transactions and data electronically, instantaneously and over vast distances.

Thus, the effects any action will have on the semiconductor industry will have far wider ramifications. Policies which promote the creation of more technologically advanced semiconductors or reduce costs imposed upon the industry thus resulting in lower semiconductor prices, will expand demand and lead to economic growth and the creation of jobs. This growth will occur not merely in the semiconductor industry itself, but,

because of the widespread and increasing use of semiconductors as essential components in other products and in production processes, in other industries as well. Enhancement of semiconductor quality and reduction in semiconductor prices leads directly to the growth of those industries which already utilize semiconductor products, and to an expansion of the number of uses for semiconductor products.

WORLDWIDE MARKETS

| | (\$ BILLIONS) | | |
|---------------------------|---------------|------|------|
| | 1975 | 1985 | 1990 |
| SEMICONDUCTORS | 4.5 | 27 | 60 |
| COMPUTERS | 18 | 105 | 185 |
| TELECOMMUNICATIONS | 34 | 103 | 204 |

At the same time, the importance of the semiconductor industry is not merely in its products and the uses to which they are put, but in the development of new technology. Because semiconductors are at the heart of virtually all high technology electronic products, an understanding of semiconductor technology is essential to the design of those other products. The rapid diffusion of semiconductor technology and the efficient use of the most advanced semiconductor products therefore determine the level of technological sophistication -- and, as a result, the marketability -- of those other products.

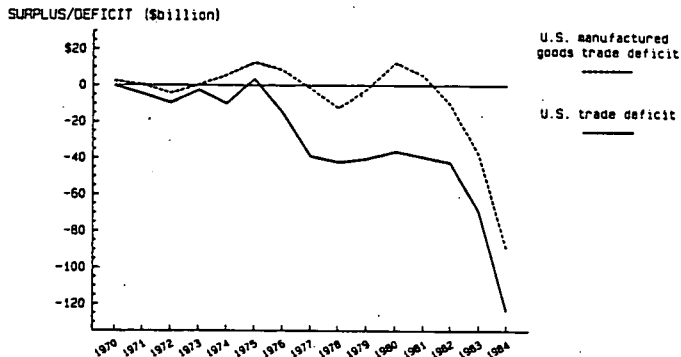
If the United States Government is seeking to maximize its leverage in taking steps to boost U.S. economic performance and to reduce the United States trade deficit, it will, in a very real sense, find that leverage in the semiconductor industry. In virtually every U.S. manufacturing industry in which domestic manufacturing is competitive with overseas competition, advanced microelectronics have been applied to the process to increase productivity and reduce costs.

The semiconductor industry is in a position of great leverage not only because semiconductors may be the key to competitiveness in other sectors, but because in the semiconductor industry growth tends to feed upon itself. The semiconductor industry has consistently experienced a 30% cost decline for every doubling of cumulative volume. This occurs because producers learn more efficient production techniques as they gain experience with new products. Cost declines, in turn, generally lead to price declines which tend to result in increased sales. Thus, public policies which result in increased growth in the semiconductor industry can be utilized with great effect on both a sectoral and an economy-wide basis to enhance U.S. competitiveness.

SIGNS OF THE INTERNATIONAL CHALLENGE

The President's Commission warns that, "a close look at U.S. performance during the past two decades reveals a declining ability to compete," and cites as indicators low U.S. productivity growth relative to our trading partners, our stagnant growth in real hourly wage rates, our relatively low investment as a percentage of GNP compared to our trading partners, the low return on manufacturing assets relative to other investment vehicles, and our unprecedented merchandise trade deficit.

THE DETERIORATION OF THE U.S.
TRADE ACCOUNT
1970-1984

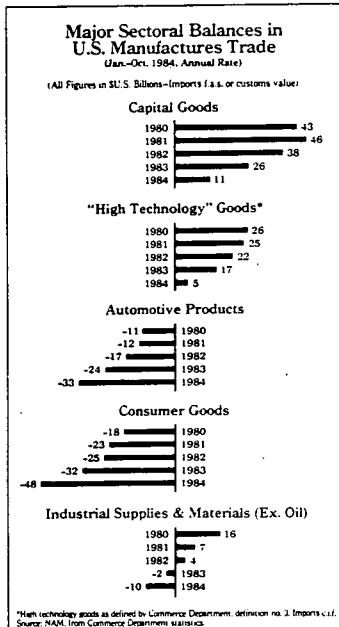


Exports are F.O.B.; Imports are C.I.F.

Certainly, some of the huge U.S. trade deficit is a direct result of the value of the dollar, which in terms of purchasing power parity (using 1978 as a base year) is up to 20% overvalued with respect to the yen. It is equally true that the deficit in part results from the more rapid growth rate of the United States economy relative to the economies of the majority of its trading partners, thus creating greater market opportunities for foreign companies in the United States than are created for U.S. companies overseas. Nevertheless, these two factors alone cannot account for all of the trade deficit, nor are efforts to address these two areas -- important as they are -- the sole approach the United States should take to reduce the trade deficit.

The United States' \$123 billion 1984 trade deficit should be regarded as a serious indication that the United States is losing its competitive edge in world trade. Particularly troublesome is the erosion of U.S. exports of high technology products. An analysis of semiconductor trade illustrates the problem.

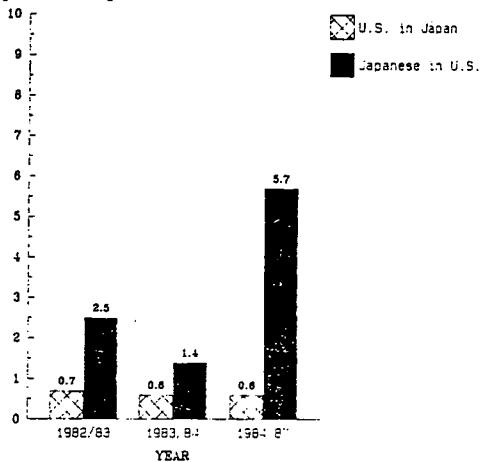
"In terms of performance by major sectors, the most notable feature in U.S. manufactures trade was the rise of both absolute levels of imports and of import penetration in capital goods and high technology. As a consequence, trade in these goods no longer offsets the large deficits in automotive and consumer goods." -- "U.S. Competitiveness and the Trade Deficit," National Association of Manufacturers, Trade and Industry (January, 1985).



The critical issue posed by the trade deficit is what long term effects will the overvalued dollar and the decline in exports have on U.S. high technology companies that must compete for global markets. World market share in semiconductors, while higher than that of our competitors, has been steadily declining. Japanese penetration of the U.S. semiconductor market has exceeded our growth in the Japanese market, and since the U.S. market is larger, this has accelerated the growth of Japanese world market share.

**GROWTH OF U.S. SHARE
OF JAPANESE MARKET VS.
JAPANESE SHARE OF
U.S. MARKET -- SEMICONDUCTORS**

Change In Percentage Points of Market Share



Underlying these trade figures are signs of a long term erosion of the U.S. competitive position. Japanese capital investments in semiconductor plant and equipment exceeded the total investments of the U.S. merchant industry (those who make and sell semiconductors) for the first time in 1983. The Japanese have not yet passed the total investments of the U.S. merchant industry combined with the U.S. captive industry (those who make semiconductors for use in their own equipment). U.S. semiconductor manufacturers invest 20-25% of sales in new plants and equipment. The Japanese producers invest at a rate of 35% of sales or higher. In R&D, the lifeblood of the industry, Japanese expenditures are approaching those of the U.S. R&D expenditures of 10% of sales are common for firms wishing to preserve world class status. These trends are not solely attributable to the overvalued dollar and other macroeconomic forces. They are

visible evidence that specific policies are needed to preserve a healthy and dynamic U.S. semiconductor industry. The purpose of this paper is to identify specific public policy objectives for 1985 and to explain how they fit into a longer term plan to promote U.S. industrial competitiveness.

THE PUBLIC POLICY AGENDA

SIA has identified four specific areas in which public policy initiatives in 1985 can have a measurable influence on the international competitiveness of high technology industries in general, and semiconductor companies in particular. These are:

1. Tax policies

- extend the R&D tax credit
- ensure that tax reform proposals recognize the effect on international competitiveness of the treatment of R&D, investments in equipment, and foreign operations;

2. Trade policies

- improve market access for U.S. semiconductor products abroad, particularly in Japan;
- avoid dumping resulting from foreign companies' installations of excess semiconductor production capacity;
- improve protection of U.S. intellectual property, which in an intensely competitive world market, represents U.S. companies' single most important advantage.

3. National Security Export Control Policies.

- export controls should be designed and administered to protect the national security without preventing U.S. companies from trading and competing in the Free World;
- any regulatory and legislative proposals, particularly those affecting distribution licenses, technical data, software, COCOM licensing and embedded microprocessors should take account of the suggestions SIA has made, including SIA's proposal for a Comprehensive Operation License.

4. Innovation and Productivity

- enhance incentives for R&D through the tax credit and direct government support;
- support procompetitive joint research;
- ensure worldwide protection of intellectual property rights;
- strength education at all levels, particularly in the scientific and technical disciplines.

The significance of these measures is not as individual solutions to particular problems, but rather as part of an overall effort to address international competitiveness. Enactment of these proposals, together with the initiatives SIA supported in 1983-1984, would mean that the U.S. had made concrete progress in responding to the international competitive challenge as described by the Presidents Commission.

Each of these areas is explored in detail in the attached papers. The purpose of this summary is to review the context for these proposals and explain how they relate to the broader objectives of the President's Commission which are:

1. Create, apply and protect technology;
2. Reduce the cost of capital to American industry;
3. Develop a more skilled, flexible, and motivated work force; and
4. Make trade a national priority.

The SIA Public Policy Agenda -- 1980-1984

SIA's program for 1985 is intended to build on the success of its efforts since 1980 when the association explicitly recognized that to improve conditions of trade for its membership it would be necessary to address all those factors which were limiting the competitiveness of U.S. semiconductor companies, not only the actions of foreign governments. The new thrust this effort represented was well received in the U.S. Government.

In 1981, SIA was very active in the development and enactment of the research and development (R&D) tax credit as a means to reduce the high effective tax rate of the semiconductor industry and to promote innovation by encouraging research and development activities. But that public policy success was only the beginning. In 1983, SIA adopted a new six point public policy program.

**SEMICONDUCTOR INDUSTRY ASSOCIATION
LEGISLATIVE PRIORITIES 1983**

1. TRADE LEGISLATION

ISSUE: Current U.S. trade laws are inadequate to address the harmful effects of foreign government targeting practices in high technology.

STATUS: On January 23, 1983, Sen. Danforth re-introduced a bill which incorporated high technology trade legislation backed by SIA in 1982.

POSITION: SIA supports passage of this and other legislation that will enable the U.S. government to deal more effectively with foreign market distorting practices.

2. EXPORT CONTROLS

ISSUE: The Export Administration Act of 1979 expires this fall and will be subject to renewal.

STATUS: New legislation will be proposed which would severely tighten U.S. export controls.

POSITION: SIA, while supporting measures to strengthen national security, opposes measures which would unnecessarily restrict exports and raise costs. SIA also supports a system of controlling technology transfer through implementation of a comprehensive operations license which recognized and utilized the mechanisms U.S. firms use to protect proprietary and business information.

3. R&D TAX CREDIT

ISSUE: U.S. firms are allowed a 25 percent tax credit for R&D expenditures which exceed prior years' levels.

STATUS: The credit is scheduled to terminate in 1985 and some members of Congress may seek to repeal it this year.

POSITION: SIA supports expansion of the R&D credit and its extension beyond 1985. SIA also proposes a zero based credit for corporate support for university research and education.

4. COPYRIGHT PROTECTION

ISSUE: U.S. copyright and patent laws do not clearly protect semiconductor circuit designs.

STATUS: Senator Hart and Rep. Don Edwards will introduce a bill clarifying copyright protection to semiconductor designs.

POSITION: SIA urges enactment of this legislation.

5. ELIMINATION OF SEMICONDUCTOR DUTIES

ISSUE: Tariffs on semiconductors constitute a barrier to trade and an additional cost which lessens U.S. competitiveness and diverts resources from R&D and capital investment.

STATUS: Authority is needed to reduce or eliminate U.S. semiconductor duties below present levels.

POSITION: SIA supports enactment of legislation to eliminate semiconductor duties as a means of encouraging other countries to take similar action.

6. ANTITRUST EXEMPTION FOR JOINT R&D

ISSUE: U.S. firms operate at a competitive disadvantage in relation to their foreign competitors because their joint R&D efforts through industry cooperative research organizations are deterred by U.S. antitrust laws.

STATUS: A number of legislative alternatives have been advanced to address this problem. Representative Edwards and Senators Glenn, Kennedy and Mathias favor one version. Senator Hart favors another.

POSITION: SIA would favor legislation to clarify U.S. antitrust laws with respect to joint R&D conducted through industry cooperative research organizations to strengthen the international competitiveness of U.S. firms.

SIA SEMICONDUCTOR INDUSTRY ASSOCIATION

Of the six specific legislative proposals contained in the SIA program, four were signed into law by the President during 1984. These bills included The Trade and Tariff Act of 1984 which made the elimination of foreign barriers to trade in high technology products a priority for U.S. Government trade negotiators and authorized the elimination of U.S. tariffs on semiconductors, the National Cooperative Research Act, which amended United States antitrust law to encourage the formation of research and development joint ventures, and the Semiconductor Chip Protection Act which created a wholly new form of intellectual property protection for semiconductors.

Efforts to expand the R&D tax credit and to make it permanent in order to permit long-range business planning based on the availability of the credit (which is due to expire at the end of 1985) were very nearly successful as was an effort to modify the Export Administration Act to avoid unnecessary restrictions on U.S. high technology exports. The Export Administration Act effort, moreover, did result in general agreement in the Congress, and throughout the United States Government that the licensing of high technology exports could be made more efficient through the adoption of certain types of comprehensive operation and bulk distribution licenses. Subsequent regulations issued by the Department of Commerce incorporated these SIA-supported measures.

In addition to these legislative efforts, SIA executives began to act as industry advisors to the United States Government in the U.S.-Japan High Technology Working Group. In November of 1983, that group agreed upon a set of Semiconductor Recommendations which called for a range of measures to encourage increased semiconductor trade between the two nations, particularly of U.S. semiconductor exports to Japan.

Taken together, these measures create a better environment in which United States semiconductor companies can develop and compete. However, more remains to be done. Since the development of the 1983 SIA public policy program, the international competitive challenge to the United States semiconductor industry has become even stronger. At the same time, the United States trade deficit has soared to a record level of \$123 billion. There is a relationship between these two facts, for international competitiveness is one of the key elements of the trade deficit, and, as demonstrated above, semiconductor technology can be critical to the competitiveness of a wide range of products.

Public Policy Issues -- 1985

TAX POLICY

The R&D tax credit is due to expire at the end of 1985. This credit has been critical in keeping the tax burden of the semiconductor industry comparable to that of other U.S. industries while also encouraging research and development activities. The credit should be made permanent and revised so as to even more effectively encourage legitimate R&D activity. If it is not made permanent, the credit's R&D-promoting effect will be severely diminished as companies will not be able to calculate its effects into their long range (two to three year) R&D plans.

Private firms may tend to underinvest in R & D because of their difficulty in reaping the full rewards of innovations, especially those with wide-ranging applications. Industry thus needs special incentives to fund R & D. Report of the President's Commission on Industrial Competitiveness.

If the United States tax code is reformed (through simplification, or to increase revenues) the revisions should retain the R&D tax credit because of the specific need to encourage innovation, and should recognize the importance of not discriminating against high technology industries by imposing on them a higher effective tax rate than other United States industries.

"Failure to extend the R&D credit not only will eliminate a valuable incentive for vitally important R&D activities, but will also mean that high technology companies -- which already have among the highest effective tax rates in U.S. industry -- will have suffered, on net, a substantial tax increase as the result of the combined effect of the 1981 (Economic Recovery Tax Act) and 1982 (Tax Equity and Fiscal Responsibility Tax Act) Acts." -- Larry R. Langdon, Corporate Tax Director and Tax Counsel of Hewlett Packard Company.

Steps should also be taken to reduce the cost of capital in the United States relative to that of the main competitors of the United States, particularly Japan. The most basic means by which this could be accomplished would be to reduce the Federal budget deficit, thus reducing the demand for capital and lowering the cost of capital to the private sector. At the same time, however, the United States could take steps to address the supply of capital on U.S. capital markets. In particular, the tax law modification process should include measures to reward saving as much as spending. Furthermore, the United States Government should suggest to the Government of Japan that Japan shift its savings/consumption ratio away from savings and more toward an equal balance.

TRADE POLICY

Foreign government intervention in the free market poses a significant problem for U.S. semiconductor companies because the capital-intensive nature of the industry makes economies of scale particularly important, and therefore makes access to the largest possible market an essential element in any semiconductor company's business plan.

In order for U.S. firms to compete effectively in world markets, we must (1) articulate and enforce trade policy in a coordinated way, (2) reduce domestic obstacles to U.S. trade competitiveness, (3) balance foreign policy and national security export controls with the need to compete in world markets, (4) expand our exports, and (5) strengthen the international trading system.

Where foreign companies have access to the United States semiconductor market, but U.S. companies do not have access to the foreign semiconductor market, or where foreign governments provide targeted support to their semiconductor industries, thus enabling them to take market share which, in a free market, could be served by U.S. companies, the foreign company can obtain a significant competitive advantage. This is particularly true if its protected domestic market is of sufficient size or if its targeted support is so solid as to result in a major differential in total available market between the U.S. and foreign firms.

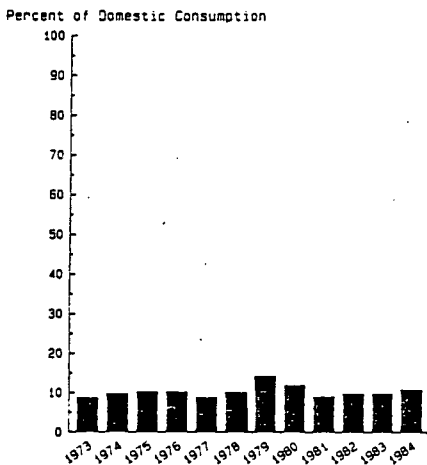
The case of government market intervention which has the greatest impact on the United States semiconductor industry is in Japan. In the Japanese semiconductor market tariff barriers were for many years combined with a broad range of non-tariff barriers (including a strong tendency to "buy Japanese"), subsidies, low-interest loans, and government-supported joint R&D efforts. In effect, the Japanese semiconductor market was closed to U.S. semiconductor producers. Although exclusion of foreign semiconductor manufacturers is no longer an official policy of the Government of Japan, U.S. companies still find that the Japanese semiconductor market does not operate according to normal market rules and that U.S.-based companies are afforded very limited access to the full market in that nation.

"Perhaps the truest test of our innovation strategy will be our ability to penetrate the Japanese market. We sell no commodity memory in Japan. Last year more than 60 percent of our sales in Japan were AMD-invented products, reflecting the success of the first five years of our innovation strategy...AMD is committed to being the number one foreign supplier of integrated circuits to the Japanese marketplace within five years."

--Statement of W. J. Sanders, III, AMD Annual Report, June 1, 1984.

Despite commitments by the Government of Japan in the U.S.-Japan High Technology Working Group's Semiconductor Recommendations to enhance the access of United States semiconductor companies to the Japanese semiconductor market, and despite a documented increase in the degree of effort United States companies have made to serve the Japanese semiconductor market,* U.S. companies' share of the Japanese semiconductor market remains at 11% -- approximately the same share U.S. companies have held since the late 1970s. In most other world markets, American semiconductor suppliers hold over fifty percent of the market, demonstrating what U.S. semiconductor products can achieve where the market is allowed to function properly.

U.S. SHARE OF THE JAPANESE SEMICONDUCTOR MARKET



* An SIA survey of nine of its member companies operating in Japan revealed that the percentage of those companies worldwide sales made in the Japanese market increased from 3.99% in the first quarter of 1983 to 4.77% in the third quarter of 1984.

To rectify this situation of market failure in Japan, SIA strongly urges the United States and Japanese Governments to agree on immediate steps to bring U.S. and Japanese sales opportunities for all semiconductor products into balance in the respective markets. SIA would prefer to achieve this balance through an expansion of U.S. participation in the Japanese market.

Another important goal of the United States Government should be to eliminate foreign government targeting practices. SIA advocates the development of legislation in the United States which will enable domestic companies to take action against imported products which are competitive because they were developed as part of a government targeting program.

At the same time, SIA supports the initiation of multilateral high technology negotiations in the General Agreement on Tariffs and Trade. These negotiations should have as their objective the conclusion of a high technology agreement to promote the free international flow of goods, freedom of investment, freedom of technology transfer, and the protection of intellectual property.

EXPORT CONTROLS

The United States and our allies work together to apply (export) controls, but the United States often imposes controls on products beyond those applied by our allies. We also differ from their practices by requiring licenses for exports to other allies, and our regulations are much more vigorously enforced. Recently, the United States has also begun to restrict technology information flows before obtaining multilateral agreement from our allies on this approach. Report of the President's Commission on Industrial Competitiveness.

The United States should extend and modify the Export Administration Act to protect legitimate national security concerns without unnecessarily limiting United States exports of high technology products. Semiconductors, as the central component in virtually all high technology products, are subject to the highest level of export licensing review of any U.S. export. This licensing process is cumbersome, time-consuming, and subject to multiple levels of review, and it is difficult to predict the amount of time which will be required to obtain an export license. Foreign governments grant licenses more efficiently and with a much higher degree of reliability than the license will be approved expeditiously. Furthermore, contracts entered into by United States semiconductor companies to sell their products overseas may be voided by the United States Government on foreign policy grounds. The uncertainty inherent in any contract with a U.S. semiconductor supplier is cause for foreign purchasers to question the reliability of U.S. companies.

SIA believes that export control regulations, to be most effective, should focus on the reliability of the foreign consignee and on the exporter's proprietary system of export control. SIA advocates the development of effective multilateral export control regulations as opposed to unilateral control which is ineffective and places U.S. companies at a competitive disadvantage. United States semiconductor companies are losing business to foreign competitors because of these U.S. Government requirements without any enhancement of U.S. national security.

INNOVATION AND PRODUCTIVITY

In order to make technology a continuing competitive advantage for the United States, we need to do three basic things: (1) create a solid foundation of science and technology that is relevant to commercial uses; (2) apply advances in knowledge to commercial products and processes; and (3) protect intellectual property by strengthening patent, copyright, trademark, and trade secret protections. Attaining these goals will require actions on the part of the Federal Government, industry, and our Nation's universities. Report of the President's Commission on Industrial Competitiveness.

In addition to the need to revise and make permanent the R&D tax credit described above, SIA supports several steps to encourage innovation in the United States semiconductor industry. An international treaty should be developed, and national laws should be enacted as a means of extending semiconductor chip design protection to other nations. The World Intellectual Property Organization (WIPO) is considering the creation of such a treaty, and the Government of Japan is developing its own law in this area. Other nations which produce or consume semiconductors -- particularly Korea, Taiwan, the ASEAN nations, and the member states of the European Community -- should also develop semiconductor chip protection laws. Such a treaty, and such laws should be consistent with the principles of the United States Semiconductor Chip Protection Act.

In addition, U.S. antitrust laws as they apply to licensing practices should be revised to promote the use of intellectual property once it is developed. In particular, licensing tie-in agreements should not be considered per se illegal, but should be judged under the rule of reason and encouraged if they are found to be pro-competitive. At the same time, the courts should be directed to find actual harm to competition before denying enforcement of exclusive rights granted under the patent and copyright laws. By encouraging the licensing of innovative products, the United States Government makes it possible to bring more innovative products to market and thereby encourages increased innovation.

Finally, United States patent laws should be modified to enable the holder of a U.S. process patent to prevent the importation of products made overseas in violation of that process patent. By better protecting this form of intellectual property, this law would encourage innovation utilizing process patents.

In the long term, the supply of trained personnel available to United States semiconductor companies will be one of the most significant determinants of the U.S. industry's ability to compete on world markets. In the education area, SIA supports a comprehensive Federal Government program to enhance the quality of science and engineering education in U.S. secondary schools and universities. This program should involve grants for faculty salaries, student scholarships, the purchase of laboratory equipment and computers, and basic research. It should also include the distribution of information to secondary school students of information on the job market for engineering and physical science graduates.

United States immigration policy should permit foreign workers whose technical expertise is not available in sufficient supply among U.S. nationals, to remain in the United States indefinitely.

MEETING THE CHALLENGE

Because of its highly leveraged position, the United States semiconductor industry has the potential to play a major role in driving the United States economy for decades to come. The industry is currently healthy and U.S. companies lead their rivals in the rest of the world in semiconductor sales and the development of new semiconductor technology. Yet, despite the best efforts of the U.S. companies and the programs enacted thus far by the United States Government, that leadership has demonstrably weakened during the 1980s due to external factors. This is true in terms of global market share as well as in levels of R&D and investment in new plant and equipment.

The strong international challenge facing the United States semiconductor industry is exemplary of the competition facing U.S. industries that is documented in the President's Commission Report. Along with the high value of the dollar, this competition has contributed to the unprecedented United States deficit in trade.

The President's Commission Report makes numerous recommendations to arrest the decline of American competitiveness. This Chapter has reviewed the challenge facing the U.S. semiconductor industry and has outlined how the recommendations of the President's Commission relate to the specific priorities of the U.S. semiconductor industry. The remaining chapters detail the specific challenges and responses that are needed to those challenges. Regardless of whether or not we take steps to promote our high technology industries, other nations are taking such steps, and they will not do so with the interest of the United States in mind. We cannot afford to lose our leadership in high technology industries -- the growth industries of the future which are already critical to so many traditional industries. SIA urges the Government to undertake the broad initiatives recommended by the President's Commission on Industrial Competitiveness as well as the specific initiatives denoted in this paper to assure a strong America with technological leadership into the Twenty-First Century.

TAB 2

REPORT
ON
TAX REFORM PROPOSALS

Semiconductor Industry Association

SIA POSITION PAPER:
TAX REFORM PROPOSALS

All of the major current proposals for reforming the Federal income tax by broadening the income tax base and lowering tax rates impact on semiconductor companies primarily through three sets of provisions: the treatment of R&D expenditures, the treatment of investments in equipment, and the treatment of international operations (including exports).

Of course, a reduction in corporate tax rates to 30 to 35 percent also has an important and positive impact. While the profits of semiconductor companies vary substantially from year to year (depending on overall economic conditions), in years of prosperity semiconductor companies pay high rates of U.S. tax. In those years substantial tax rate reductions can be of major importance. However, overall the impact of the changes to the three types of provisions listed above can be even more important to most semiconductor companies.

The Treatment of R&D

The Treasury tax reform proposal provides for a three-year extension of the current R&D tax credit, with a narrowing of the definition of qualifying R&D expenditures. Other proposals do not include a credit extension. SIA strongly supports the extension of the credit and the narrowing

of the definition of qualified research (along the lines of last year's Senate-passed legislation).

The semiconductor industry invests in R&D at a rate higher than virtually any other industry in the country; many industry companies spend 10-14 percent of sales revenue on R&D. These investment levels must continue to grow if the industry is to remain competitive with Japanese and other foreign companies in a market where products and technologies change every two to three years and where foreign governments offer major incentives to their companies. 1/ The R&D tax credit is crucial to assuring that U.S. semiconductor companies can maximize their R&D investments.

However, extending the credit for three years is not enough. Planning for R&D inherently is a long run activity; most R&D projects require four to eight years from the time a decision to proceed is made until the project is successfully completed. Extending the R&D credit for three or fewer years can thus reduce its effectiveness as an incentive because companies cannot fully take it into account in making their R&D investment decisions. Recent studies by the Congressional Research Service and by individuals at the Brookings Institution (in conjunction with Data Resources, Inc.) conclude

1/ Japan, for example, has had an R&D tax credit since 1966.

that the R&D credit can be a more effective incentive if it is made a permanent feature of the tax code. SIA urges that any final tax reform proposal make the R&D tax credit a permanent part of the tax code.

Investments in Equipment

The world semiconductor market is growing at a rate of 20 percent per year. Moreover, each new advance in semiconductor manufacturing technology requires the industry to be more capital intensive. This combination of the increasingly capital-intensive nature of the semiconductor manufacturing business and the industry's rapid growth forces U.S. semiconductor companies to make extraordinarily large investments in equipment each year to stay competitive. In recent years, the Japanese semiconductor industry, with a smaller share of the world market, has been investing in new facilities in larger absolute amounts than the U.S. industry. In these competitive circumstances, the tax treatment of the recovery of new equipment costs is extremely important. The various capital cost recovery reform proposals present two serious problems for semiconductor companies.

First, the Treasury proposal eliminates ACRS and attempts to establish depreciation rates and lives which reflect the "economic depreciation" of equipment. However, the depreciation periods established for most semiconductor

manufacturing equipment do not accomplish this goal. Semiconductor manufacturing technology advances to produce new generations of equipment every two to three years. This rate of technological change quickly makes older equipment obsolete; thus, its rate of "economic depreciation" is in fact quite rapid. Yet, under the Treasury proposal semiconductor manufacturing equipment is depreciated at a 12 percent rate over essentially a seventeen year period, a rate of depreciation far slower than true economic depreciation. Under any such "economic depreciation" system, SIA believes that the depreciation rates for semiconductor manufacturing equipment must be refined to reflect the fact of rapid technological obsolescence in the industry.

Second, and more importantly, any system of capital cost recovery is seriously deficient if it eliminates all incentives for new investments in plant and equipment. The Kemp-Kasten proposal and, to a lesser extent, the Bradley-Gephardt proposal provide these kinds of incentives through their systems of depreciation. However, the Treasury's "economic depreciation" proposal, while indexed for inflation, intentionally provides no incentive element. Investments in plant and equipment are the key to increases in productivity in semiconductor manufacturing and in other U.S. manufacturing sectors. The incentives enacted in 1981 have led to a broad expansion of capital goods investments -- much of it oriented

toward high technology electronics equipment which can make U.S. workers more productive and U.S. manufacturers more efficient in all industries. Only through such productivity and efficiency increases can U.S. industry generally remain competitive in international markets while permitting our workers to enjoy a high standard of living. SIA urges that any final tax reform proposal include incentives for new investments in plant and equipment.

SIA further believes that the investment credit rather than some form of accelerated depreciation is the most efficient of all incentives for new investments in plant and equipment. The investment credit is neutral among types of assets and industries. It is an explicit incentive which can be easily understood and taken into account in the decisions of potential purchasers. It has been shown to have a powerful, positive impact on our economy. SIA thus recommends that any final tax reform proposal include a system of economic depreciation indexed for inflation (similar to the Treasury proposal but with properly measured useful lives and depreciation rates for semiconductor manufacturing equipment), but retain the investment credit in some substantial form to preserve needed incentives for new plant and equipment investments.

Treatment of Foreign Operations

Because semiconductor companies are global in nature, U.S. tax laws can have a substantial impact on their ability to conduct worldwide operations in a manner consistent with international competitive conditions. However, the various tax reform proposals would limit the flexibility of U.S. companies to structure their operations in a competitive manner in two respects.

First, most proposals would significantly decrease U.S. tax benefits for exports from the United States. Under provisions enacted just last year, U.S. companies are permitted to establish Foreign Sales Corporations (FSCs) and, in addition, to treat a portion of their income from exports as foreign source income eligible for the foreign tax credit. The Kemp-Kasten and Bradley-Gephardt would repeal the FSC provisions. The Treasury proposal would retain FSC but would generally recharacterize additional foreign source income from exports as U.S. source income. Either type of proposal would substantially increase U.S. taxation of exports. At a time of a record U.S. dollar and record trade deficits, such an increase is ill-advised.

Second, the Treasury proposal would change the calculation of the foreign tax credit in a way that does not recognize the integrated nature of worldwide semiconductor businesses. Under the proposal companies would be required to

compute their foreign tax credit on a separate country-by-country basis rather than on an overall foreign operations basis. This change would in effect force companies to dissect their foreign operations into segments defined by arbitrary country boundaries and compute their foreign tax credit separately on each arbitrarily defined segment. The result will be a serious increase in the level of complexity of the U.S. tax system, a serious increase in the level of disputes between taxpayers and the Internal Revenue Service, and most importantly, a decrease in the ability of U.S. companies to structure their international operations in a competitive manner without substantially increasing U.S. tax costs.

In addition, the Bradley-Gephardt proposal would currently tax all the earnings of all foreign affiliates of U.S. companies. This proposal would put electronics companies at a clear and distinct disadvantage compared to foreign competitors, which would remain free to receive the full benefit of various types of foreign tax reductions.

These proposals related to the international operations of U.S. companies are neither necessary nor desirable as part of an overall tax reform package. SIA strongly urges that they be reconsidered.

Finally, SIA is concerned that one result of any final reform proposal could be to increase the U.S. tax burden on

companies manufacturing in the United States and reduce the tax burden of companies manufacturing abroad. Such a shift in tax burden can only weaken further the competitiveness of U.S. companies. It cannot be tolerated given our current imbalance of trade with many of our major trading partners. If such a shift would occur in any final reform proposal, notwithstanding the inclusion of incentives for R&D and investments in new plant and equipment, the addition of a consumption tax (such as a business transfer tax) which is imposed on imports, rebatable on exports and creditable against other U.S. taxes, should be seriously considered.

Conclusion

SIA and its member companies can be supportive of broad tax reform if the reform proposals recognize the importance of R&D and productivity-enhancing investments in plant and equipment in ways that increase rather than weaken the competitiveness of U.S. companies. Thus, reform proposals must include, as does the Treasury proposal, continued R&D incentives like the R&D tax credit. Similarly, like Kemp-Kasten and, to a lesser extent, Bradley-Gephardt, the proposals must preserve substantial incentives, structured in a neutral fashion, for investment in new plant and equipment. Finally, reform proposals must recognize that tax changes in the international area must be balanced by considerations for

the competitiveness of U.S. exporters and U.S. companies operating abroad. Thus, proposals to eliminate the Foreign Sales Corporation provisions or foreign source income on exports and proposals to tax currently the earnings of U.S. foreign affiliates or to adopt a "per country" calculation of the foreign tax credit should be reconsidered.

Semiconductor Industry Association

TAB 3

REPORT
ON
TRADE POLICY

Semiconductor Industry Association

Since its formation in 1977, the Semiconductor Industry Association has been actively involved in public policy issues relating to international trade. SIA has consistently supported the basic principles of open markets and free trade which underlie the current international trading system. By sponsoring initiatives which have eliminated semiconductor tariffs in the United States and Japan, SIA has contributed directly to the dismantling of international trade barriers.

At the same time, SIA recognizes that the world is far from ideal. The progressive elimination of trade barriers has not been uniform, and some countries have employed market-distorting measures, such as subsidies and "buy national" policies, designed to give their industries an edge in international competition. SIA has favored a constructive and realistic response to such practices, seeking to confront them directly but without seeking drastic retaliatory measures which might jeopardize the system of free trade.

This paper is released against a background of disturbing recent trends in semiconductor trade, including the continuing resistance of the Japanese market to semiconductor imports, and signs that protectionist tendencies in microelectronics are spreading in other countries. Reflecting these trends, SIA's 1985 public policy concerns are directed at three basic goals:

- Improved market access for U.S. semiconductor products abroad, particularly in Japan;

- Avoidance of dumping[†] resulting from foreign companies' installation of excess semiconductor production capacity; and
- Improved protection of U.S. intellectual property, which in an intensely competitive world market, represents U.S. companies' single most important advantage.

This paper explains why SIA regards these goals as important.

Until now the decline of traditional industries has been counterbalanced by the rapid growth of new, technology-intensive U.S. industries which have enjoyed dramatic competitive success in the international marketplace. These industries include computers, telecommunications, data processing, advanced aircraft, precision instruments and microelectronics. Their strong competitiveness is a direct reflection of one of this country's remaining international comparative advantages -- its technological leadership. If the U.S. economy is to remain the most successful in the world during the next decade, this country must retain a strong international market position in these key industries.

[†] The term "dumping" as used throughout this document is used in the context of the legal concept of dumping as contained in the Trade Agreements Act of 1979. Under that act, dumping occurs when sales of an imported product are made in the United States market at "less than fair value". Fair value, in turn, is defined in the Trade Agreements Act of 1979 to mean the price at which the allegedly dumped good is sold in the country from which it was exported (as long as the price is above the cost of production of the product), or in the event insufficient sales above cost of production have occurred in that home market, by:

- a. comparing the price in the U.S. market with the price of the same good in some representative third market, or
- b. constructing a fair value for the good by adding the cost of materials required to create the good, the cost of production of the good, 10% or more for general expenses and 8% or more for profit.

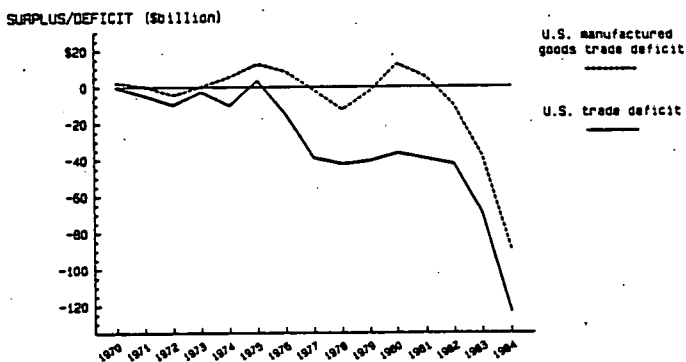
It should be noted that there has been little administrative experience under the Trade Agreements Act of 1979 with standard pricing patterns in the semiconductor industry, including learning curve pricing and forward pricing; nor is it clear how R&D costs should be allocated in determining average costs of production. The standard semiconductor pricing techniques do not accord well with the standard administrative practice in such cases of assuming that current prices will remain unchanged into the future.

As the introductory section of this document made clear, the semiconductor industry heavily influences the level of competitiveness attained by most other technology-intensive U.S. industries, and is playing an important role in restoring international competitiveness to other U.S. manufacturing sectors.

The current issues facing the U.S. semiconductor industry in international trade are therefore worth examining and understanding, since they bear directly on this country's long run economic well-being.

Figure 1

THE DETERIORATION OF THE U.S. TRADE ACCOUNT 1970-1984



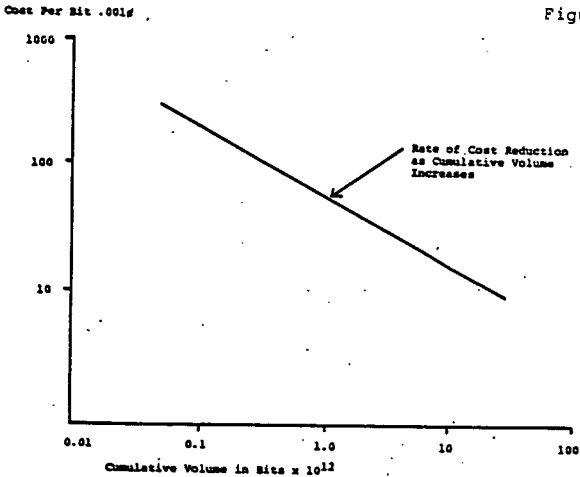
Source: U.S. Census Bureau; U.S. Dept. of Commerce.

THE COMPETITIVE BACKGROUND

The semiconductor was invented in the United States, and virtually every major subsequent breakthrough in semiconductor technology has been achieved by U.S. companies. In the first decades of its existence, the semiconductor industry was led by a rapidly growing number of American companies pushing to achieve advances in semiconductor technology and to commercialize them rapidly, ahead of rival U.S. companies. The intense "leapfrogging" competition between these firms led to the development and dissemination of semiconductor technology throughout the economy in a remarkably short time, in what some observers have characterized as a "second industrial revolution."

U.S. semiconductor companies quickly learned that a key element of competitive success was achieving a high sales volume. Because the cost of making semiconductors declined in a mathematically predictable fashion as cumulative output was increased, the more chips that a company made and sold, the more cheaply it could make the same product in the future. In part this phenomenon was attributable to scale economies, but it also reflected "learning economies," the methods of achieving yield improvements and other cost reductions that are discovered by performing a production task repeatedly. (Figure 2). Market strategies based on high sales volume and rapidly declining costs, when successful, yielded profits that were invested in the next round of innovation.*

* Investment decisions can affect pricing actions. Substantial investment, if written off against early production causes prices to fluctuate downward. This is sometimes referred to as "learning curve pricing". Another pricing technique used in the semiconductor industry is known as "forward pricing." A producer using the forward pricing technique estimates the number of units which will be sold over the product's life, and then divides that number into the forecasted cost of production to establish the unit cost. To this result are added other expenses and a profit factor. The result is generally a more stable pricing pattern over time than will occur with learning curve pricing.

THE LEARNING CURVE

The desire to achieve higher production volume, and hence lower costs, led U.S. companies to seek new applications for microelectronics, giving rise to new products such as digital watches and pocket calculators; the rapidly declining price of such products put them within reach of millions of consumers, leading to further growth in semiconductor sales volume and further reductions in cost. The same competitive quest for higher sales volume sent U.S. semiconductor companies into the international market, seeking outlets for their products in Europe, Japan, and Southeast Asia. They recognized that by increasing their total sales volume through added sales in such markets, they cut the costs of all of their products, including those sold in the U.S., giving them an edge over rivals who failed to pursue such an international strategy. It became evident that in order to be competitive in the United States, a semiconductor company needed to compete aggressively in all semiconductor markets.

Until the early 1970s, international competition in semiconductors was largely a contest waged between U.S. companies. U.S. semiconductor firms dominated the U.S. market and established strong market positions in Europe and in the nations of East Asia, whose growing consumer electronics industries offered a significant outlet for microelectronics products. Although this was a period of high inflation, competition between U.S. companies continually drove down the price of semiconductors and semiconductor-based products.

The Emergence of Japan

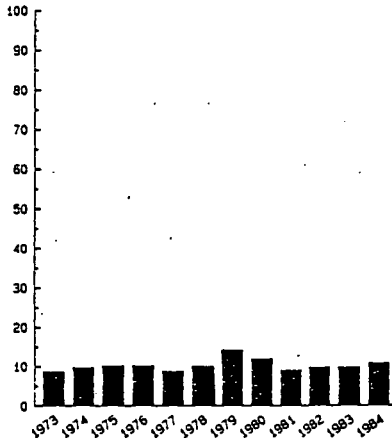
In the 1970s, the first significant foreign challenge to the U.S. industry emerged -- that of Japan. Recognizing the link between semiconductor technology and the development of a broad range of advanced industries, the Japanese government undertook a comprehensive program to establish an indigenous semiconductor industry in Japan, targeting this sector for a variety of promotional policies. Because Japan possessed a huge consumer electronics industry, as well as a growing information technologies sector, there existed in Japan a sufficient demand to support a Japanese semiconductor industry.

The Japanese government negotiated the acquisition of semiconductor technology from U.S. companies, selected a group of Japanese companies to lead the nation's semiconductor development, and sponsored a series of industry-government research and development projects to upgrade the technological level of Japanese microelectronics. During this "catch-up" period, U.S. semiconductor investment in Japan was restricted, and the Japanese domestic market was protected by a system of import licenses and quotas. U.S. companies were able to sell semiconductor products in Japan which Japanese firms did not yet make, but as Japanese companies developed an indigenous capability in a particular product area, U.S. firms' sales tended to disappear. Thus, while U.S. semiconductor firms enjoyed a strong position in all other world markets, they never held more than a foothold in Japan, rarely exceeding 10 percent of the market (Figure 3).

U.S. SHARE OF THE JAPANESE SEMICONDUCTOR MARKET

Percent of Domestic Consumption

Figure 3



The Japanese microelectronics development program made rapid strides. By the late 1970s, Japanese firms began exporting large numbers of semiconductors themselves. The Japanese companies did not at first challenge U.S. firms across a broad range of product lines, but chose to concentrate on a comparatively few standard products, such as computer memories, for which a huge potential market existed. Japanese firms quickly achieved a major penetration of the U.S. market in these product areas and emerged as a major challenge to U.S. companies in East Asia and Europe. By 1983 they had achieved a dominant world market position in one key product area, random access memories, and were rapidly diversifying into other product lines. During 1984, the share of the U.S. integrated circuit market held by Japanese based companies increased five percentage points to 18.3% in the fourth quarter of the year. As this occurred, the U.S. market position in Japan -- despite major efforts by U.S. companies -- was declining during the third and fourth quarters.

New Entrants

By the mid-1980s, international semiconductor competition, began to assume significant multilateral aspects. In addition to Japan, other countries, including most notably Korea and the nations of the European Communities, concluded that they too must promote their domestic microelectronics industries. The example of Japanese targeting and the importance of a vigorous

FRANCE MOVES TOWARD PROTECTIONISM.

- Q. Do you favor the idea of a certain degree of "European protectionism? Do you consider it desirable to strengthen the protective mechanism in certain sensitive markets?
- A. What France hopes is that joint commercial policy will not transform the Community into a watered down free-exchange zone on the world economic map. While respecting our international commitments, our joint commercial policy must be the instrument of our industrial development. . . . [I]nterim action is also possible at this time to spur the creation of industries of the future, such as those stemming from advanced technologies.

Laurent Fabius
 French Minister of
 Industry and Research in
L'Usine Nouvelle,
 October 13, 1983

KOREA ENTERS THE FIELD

The fever in financial circles of the semiconductor industry has been increasing with every passing day. It is reported that the five major semiconductor firms, Samsung, Kumsong, Hyundai, Daewou and Hanguk, have firmly established ambitious short and long-term plans, according to which these companies will invest a total of 1,893.7 billion won during the next five years, and each company will target export goals of up to \$650 million beginning in the late 1980s. . . . [The firms] have each formulated massive investment plans and are doing their best to make another leap in this field because other new firms are in pursuit.

- Hanguk Kyongje Sinmun
 (Seoul)
 July 17, 1984

THE EUROPEAN COMMUNITIES PROMOTIONAL EFFORT

[A] distinctive characteristic of the ESPRIT program is, as its name indicates, its strategic character. Strategic, first, through the mobilization of means: close to 2,000 man-years over 5 years, with a budget of 1.5 billion ECUs. . . . The ESPRIT program also derives its strategic character from the selection of sectors on which research must concentrate. . . . Microelectronics and advanced data processing will receive preferential treatment when resources are allocated.

- ECC Official Gilbert -
Francois Caty in
Futuribles, June 1984

GERMAN SUBSIDIES FOR R&D

Over the past 15 years, Siemens obtained about DM 1.2 billion in direct government research promotion funds. This money, I would say, was well invested. . . . It helped us to catch up technologically in the field of microelectronics.

- Siemens Board Member
Karl Heinz Beckurts
in Wirtschaftswoche,
November 11, 1983

semiconductor industry has not been lost on these countries. Some have determined that one way to "catch up" could be to establish protective barriers around their domestic markets while pressing forward with intensive, government-backed R&D programs. While the precise shape of these nations' microelectronics development programs has not yet emerged, such policies could play a significant role in determining the nature of international semiconductor competition in the late 1980s.

COMPETITION IN THE LATE 1980s

With an increasing number of countries entering the microelectronics arena, the international marketplace will be intensely competitive in the late 1980s. This country has a sizeable stake in the outcome of this competition, since the loss of market position by the U.S. microelectronics sector would be felt across many sectors of the U.S. economy.

Many factors will have a bearing on international competitive outcomes in microelectronics -- including such factors as exchange rates, the comparative cost of capital, and the availability of trained engineers. However, from the perspective of U.S. producers, the same basic factors which have proven decisive in the past are likely to remain critical determinants of their performance:

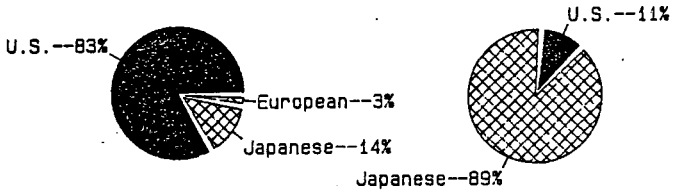
- Sustaining a high sales volume will remain essential if U.S. firms are to hold down costs and stay competitive. This requires maintaining and expanding access to growing foreign markets and reducing and preventing trade barriers.
- The U.S. industry must exploit its one clear competitive advantage -- its technological lead -- to the maximum extent possible. This will require improved protection of U.S. semiconductor firms' intellectual property rights to prevent dissipation of this key asset.

A Competitive Scenario

It is of course impossible to predict the future with certainty, but past and current trends do afford some basis for exploring the possible direction of market developments over the coming years. Figure 4 depicts one scenario for the competitive balance in the world semiconductor market in 1987, based on a realistic projection of existing trends. This scenario reflects neither the "best" nor the "worst" case from the perspective of the U.S. industry; it is simply a best guess as to the likely state of the market in two years if present developments continue.

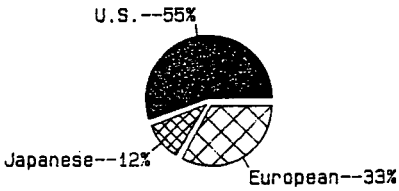
SEMICONDUCTOR MARKET SHARE

1984

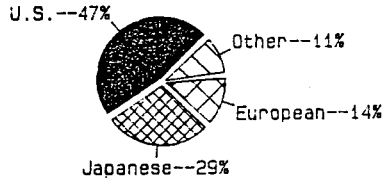


U.S. MARKET
\$11.6 BILLION

JAPANESE MARKET
\$8 BILLION



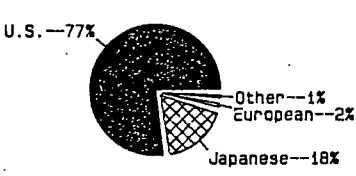
EUROPEAN MARKET
\$4.74 BILLION



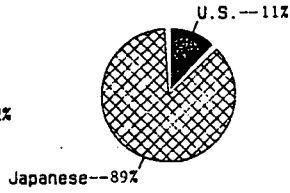
OTHER MARKETS
\$1.7 BILLION

SEMICONDUCTOR MARKET SHARE

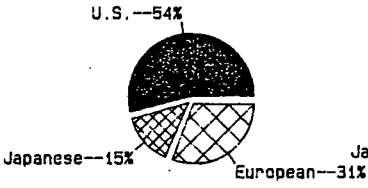
1987



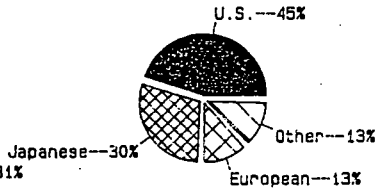
U.S. MARKET
\$18.1 BILLION



JAPANESE MARKET
\$13.65 BILLION



EUROPEAN MARKET
\$6.66 BILLION



OTHER MARKETS
\$2.92 BILLION

Under this scenario, by 1987, the world demand for semiconductors will have grown substantially beyond current levels, with sales volume of both U.S. and Japanese firms increasing in absolute terms. However, the proportional Japanese share of the world market will have increased markedly. The principal reason will be the rapid growth in demand in the Japanese market, coupled with a continued inability of foreign producers to achieve more than a marginal presence in that market. This secure domestic base will enable Japanese firms to expand their position in foreign markets -- most notably in the United States, but also in the rapidly growing markets of East Asia and Europe.

At the same time, new or expanded indigenous semiconductor industries will enter the market with an increasing impact. These new competitors will include most notably the Korean industry, but also those in the member states of the European Community, Taiwan, and even countries such as Brazil, Sweden and South Africa. U.S. and Japanese producers will be foreclosed from a portion of these nation's domestic markets, reflecting in part market competition from these new entrants but growing protectionism. Korean and European producers can be expected to begin capturing some segments of the export market from the Americans and Japanese.

Japanese and European producers will gain some volume advantage through sales to Comecon, a market from which U.S. firms are largely foreclosed by U.S. government export controls. U.S. producers will lose market share to the Japanese, and to a lesser extent, to the Koreans, in the United States market, but reflecting their technological lead, they will retain a reduced, but still majority share of the U.S. market as well as a comparatively strong position in most export markets. Their net sales volume to Japan will increase, reflecting market growth, but their market share will not grow substantially.

In effect, under this scenario, by 1987 the U.S. semiconductor industry will be engaged in a toe-to-toe contest with Japan in virtually all major world markets, with a number of "new entrants" emerging to challenge the industries of both countries. The U.S. industry's principal disadvantages will be the fact that it is wholly or partially foreclosed from several key world markets -- Japan, Comecon, and possibly segments of the European and Korean markets. The principal U.S. advantage will be its continuing technological edge -- provided that this superiority can be translated into market advantage.

Determinants of Success

In this competitive environment, a change in relative market position in one part of the world may significantly effect the competitive balance in all other world markets. For example, if the adoption of protectionist trade measures in the European Communities or Korea were to foreclose U.S. firms from large traditional markets in those countries, the net effect would be an increase in the worldwide costs of U.S. semiconductor firms, and a deterioration in their cost-competitiveness vis-a-vis Japan. Similarly, the continued failure of the Japanese semiconductor market to function efficiently with regard to imports, coupled with rapidly expanding Japanese sales in the U.S. market, will adversely affect the U.S. industry's cost-competitiveness by diminishing U.S. firm's opportunities to build sales volume. Conversely, technological advances by U.S. companies -- whether in the form of new types of "customized" chips or improved, high-volume commodity devices -- can be expected to strengthen and possibly improve the U.S. market position worldwide.

The U.S. semiconductor industry recognizes that it will face an intensely competitive world environment in 1990, and that at best its margin of safety will be very thin. Its principal trade policy concerns today therefore relate to those factors which will be decisive in enabling it to retain a strong international competitive position -- maintaining international market access and protecting U.S. companies' technology from piracy by foreign competitors.

POLICY CONCERN: IMPROVE MARKET ACCESS

On March 1, 1985, following enactment of legislation sponsored by SIA, the U.S. tariff on semiconductors -- already low -- was completely eliminated. The U.S. semiconductor market is now completely open to international trade. Moreover, the rapid growth in foreign sales in the U.S. underscores the absence of non-tariff barriers -- during the fourth quarter of 1984, Japanese firms held 18.3% of the U.S. integrated circuit market, a share that is growing rapidly, and as Korean, European and other semiconductor industries develop, they can be expected to achieve significant sales in the U.S. Such active foreign competition in the U.S. market benefits virtually all U.S. high technology industries, providing them with a wider array of components at low cost. In and of itself, active -- and expanding -- foreign semiconductor penetration of the U.S. market poses no inherent danger to the U.S. semiconductor industry, which has always prospered in an intensely competitive environment.

A major threat is posed, however, when the domestic market of a large producing nation, such as Japan, is wholly or partially closed to U.S. products. Protected markets afford foreign producers a secure, added sales volume base which enables them to achieve greater cost reductions and thus to enhance their competitiveness in export markets. In semiconductors as in other industries, establishment of a protected home market is often a prelude to an export drive characterized by high volume sales and highly aggressive pricing.

Japan

The most important market access problem confronting the U.S. industry semiconductor industry has always been that of Japan. The Japanese government's formal protection of its semiconductor market ended in 1974. Thereafter, however, the foreign share of Japan's semiconductor market showed virtually no increase, reflecting the fact that Japanese semiconductor-consuming firms -- which were often also the leading Japanese semiconductor producers -- pursued an unofficial "buy Japanese" policy. To the extent that U.S. firms achieved sales in Japan, it was usually with products which Japanese companies could not yet make themselves. The result has been that the semiconductor market in Japan is not a free one for U.S. semiconductor companies.

In 1983 the U.S. and Japanese governments engaged in intensive bilateral discussions of the semiconductor market access problem in the so-called High Technology Working Group (HTWG). Japanese government officials, as well as a number of leading Japanese electronics executives, agreed that measures should be taken to increase market opportunities for U.S. companies in Japan. Shortly thereafter, U.S. semiconductor sales in Japan, and the U.S. share of the Japanese semiconductor market, began to increase.

However, after this promising beginning, the situation began to deteriorate. Before any significant growth in U.S. companies' market share had occurred, U.S. sales in Japan leveled off, and after the second quarter of 1984, the U.S. share of the Japanese market began to decline. Figure 5 illustrates the reductions in U.S. semiconductor companies' bookings in Japan -- an indication that future shipments will decline in a similar fashion. A survey of SIA member companies operating in Japan indicates that while the Japanese government's efforts had some initial effect, the government has not made any significant recent effort to encourage increased use of U.S. products or the development of long term relationships between U.S. semiconductor suppliers and Japanese users. Moreover, Japanese government efforts to increase sales have often not been reflected in the decisions of the purchasing managers of the Japanese companies which buy the chips.

**U.S. SEMICONDUCTOR EXECUTIVES COMMENT
ON JAPANESE MARKET OPENING EFFORTS**

- Those companies which are open to foreign suppliers continue to be open. Those that are closed remain so. Net effect is zero.
- We have not seen any tangible evidence of the major Japanese companies wishing to buy more of our products.
- We believe that top management of our large customers attempts to set corporate policy which takes into account international implications. However, further down into the organization the decision makers are usually purchasing managers and engineering managers, and these people tend to recommend Japanese product first.

**SIA MEMBER COMPANIES' BOOKINGS IN JAPAN
BY CALENDAR YEAR QUARTER -- \$ MILLIONS ***

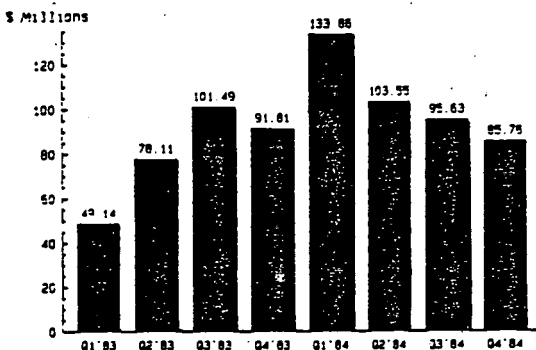


Figure 5

* Based on responses by nine SIA Members, representing 31% of total world semiconductor sales, to a survey conducted in November, 1984.

Thus, the U.S. semiconductor industry, which a year ago was making some progress -- admittedly very gradual -- in expanding its market position in Japan, is now seeing even these modest gains erased. At the same time, the Japanese share of the U.S. market has doubled every year for the past four years, reaching a record high in the fourth quarter of 1984. Even calculated on an annual basis, which dampens the fourth quarter surge of Japanese companies' share of the U.S. market and the slippage of U.S. firms' share of the Japanese market, the Japanese companies enjoy a market share in the U.S. which is more than 25% greater than the level of U.S. companies' market share in Japan. This market imbalance is the number one trade problem confronting the U.S. semiconductor industry today, and is likely to remain so through the end of the decade.

THE NEED FOR A GREATER JAPANESE GOVERNMENT EFFORT

Given the difficulties that structural factors pose for somebody to get into the Japanese market, there are really only two choices. . . . One of them is that, in a series of statesmanlike and dramatic moves, the Japanese government will take some steps to provide for significant foreign participation in its economy. And by significant, I don't mean the token 2-3% market share; we're talking in terms of 20-30% market shares -- the same kinds of market shares that Japanese companies get in the U.S. economy. . . . The alternative to that is that the Japanese, because of the built-in advantage of being protected in their own market and at the same time being able to attack everyone else's market, will move inexorably to dominate major industries, both in high tech and non high tech.

- Clyde Prestowitz
Assistant Secretary for
International Economic
Policy
U.S. Department of
Commerce

Possible Japanese Initiatives

The Japan market access problem is by no means insoluble. Prime Minister Nakasone's commitment to President Reagan at their January 2, 1985 meeting to increase Japanese imports of U.S. products coupled with the strong interest which U.S. companies have in serving the Japanese market provide reason to believe it will be possible to improve U.S. companies access to the Japanese semiconductor market this year. The Market Oriented Selected Sector (MOSS) talks which grew out of the Reagan - Nakasone meeting will focus on the Electronics Sector as one of four areas in which U.S. access to the Japanese market has been kept artificially low. In the context of the current efforts in this area, there are several steps which the Government of Japan should take to cause its market for semiconductors to function efficiently.

For example, the negotiators for the United State Government and the Government of Japan could agree upon a figure which in a free Japanese semiconductor market would represent the share held by U.S. companies. The Government of Japan would then commit itself to taking all actions necessary to reach that target figure. Under Secretary of State Wallis, who led the U.S. delegation which initiated the MOSS talks, estimated that, of the \$36 billion U.S. trade deficit with Japan, \$10 billion was the result of closed Japanese markets in the four MOSS sectors. Secretary of Commerce Baldrige has placed the figure at \$12 billion. The share of the Japanese semiconductor market held by U.S. companies -- which in other major world markets hold market shares of 50% or more -- should be at least equal to the share of the larger U.S. market held by Japanese semiconductor companies during the fourth quarter of 1984. In terms of 1984 sales, this would result in an immediate increase in U.S. semiconductor sales in Japan to \$1.5 billion.

In addition, the measures which the Japanese government has implemented to promote its semiconductor industry in the past have been taken pursuant to a series of "extraordinary measures" laws, authorizing subsidies, loans and tax breaks, and setting targets for efficiency and technological attainment in designated areas. The current extraordinary measures law, Law No. 84 of 1978, expires in 1985, and the Japanese Diet is now considering a successor. If the Japanese government seeks to avert future trade friction in microelectronics, an excellent beginning could be made by designing the new law primarily as a measure to promote semiconductor imports rather than to implement programs which will have the effect of further stimulating Japanese semiconductor exports.

As long as the Japanese market remains only partially open to U.S. products, the danger exists, in the event of an economic downturn, of an abrupt Japanese export drive, characterized by aggressive discounting, as has occurred in past recessions. Such export drives are a natural by-product of closed markets (particularly when combined with a situation of excess capacity such as appears to be developing today in Japan), and the danger of such a phenomenon occurring will remain as long as the Japanese market is not completely open to foreign sales. If a renewed Japanese export drive occurred during a recessionary period, major trade friction could result -- but this problem is preventable. One of the most important achievements of the HTWG was the establishment of a system of trade data collection which provides a detailed, up-to-date picture of semiconductor trade flows between the two countries, and which can detect sudden surges of semiconductor exports. This system needs to be upgraded so that when such a surge occurs, it is possible to ascertain whether the surge simply reflects a response to increased demand, or whether dumping is occurring.

Europe and Korea

Market access in microelectronics is an issue which is likely to involve an increasing number of countries in addition to Japan in the late 1980s. The nations of the European Communities, for example, are launching ambitious new microelectronics promotion plans, and in at least one of these countries, France, this effort features a "buy national" thrust. While the Community semiconductor duty is already high -- 17 percent -- U.S. firms have now been permitted to invest in Europe, and have enjoyed a solid market position for many years. However, U.S. subsidiaries are now being excluded from some European microelectronics development projects, and with the Community's high technology policy acquiring increasingly protectionist overtones, the extent to which the U.S. industry will be able to retain its current position in Europe in the future is an open question.

Korea has traditionally been a large market for U.S. chips, and although that country has undertaken a massive commitment to establish a semiconductor industry, it has not thus far taken steps to restrict U.S. sales. However, Korea banned imports of small computers in 1982 to support the establishment of an indigenous computer industry, and if the Korean government feels that restrictions on semiconductor imports and investment are required to facilitate the development of a Korean microelectronics industry, it is quite possible that it will impose such restrictions.

Multilateral High Technology Negotiations

The growing number of countries entering microelectronics, and the proliferation of protectionist policies, subsidies, cartels and other practices in this industry raises the prospect of serious trade friction over the next decade. In the past, such problems in other industries have been addressed in successive rounds of multilateral trade negotiations, and have resulted in an agreed set of rules governing trade which is embodied in the General Agreement on Tariffs and Trade (GATT) and its satellite agreements. A new round of multilateral negotiations, such as has been proposed by President Reagan in his 1985 State of the Union address and for which the trade ministers of the U.S., Japan, Canada and the European Community have agreed to prepare, should include consideration of the problems surrounding international trade in high technology products.

The GATT should work toward a high technology agreement which incorporates the following principles:

1. the free flow of high technology goods without tariff or non-tariff barriers;
2. protection of new forms of intellectual property;
3. freedom of investment; and
4. freedom of transfer of technology within the West.

An agreement on these high technology items would benefit not only the United States and Japan which have developed high technology industries, but the nations of the European Community and the less developed nations. In fact, this latter class of countries would be the most harmed by the failure of the GATT to develop a new set of international norms to stimulate the free flow of technology and technologically sophisticated goods between nations.

POLICY CONCERN: PROTECTION OF INTELLECTUAL PROPERTY

The U.S. semiconductor industry's strong world market position today is a direct reflection of its continuing technological edge, which represents its one clear international competitive advantage. One manifestation of this advantage is the fact that the U.S. industry has consistently been able to maintain a market share in Japan of about ten percent -- virtually all of which represents sales of products which, despite all of their progress, Japanese firms are still unable to make.

This important competitive advantage can be weakened, however, if U.S. know-how is dissipated to foreign companies without appropriate compensation to the companies who developed it. The development of new semiconductor technologies requires increasingly large commitments of capital, and if a company cannot be sure of reaping the benefits of that investment -- that is, if its technology can be pirated -- it loses the incentive to invest. At the very least, a firm that develops technology must be assured that it can recoup licensing fees and royalties from other firms which seek to exploit its technology.

The Chip Protection Act

In 1984 the U.S. adopted the Semiconductor Chip Protection Act which extended a new form of intellectual property protection to semiconductor mask designs. While this legislation protects U.S. firms from sale of chips based on pirated designs in the U.S., it does not afford protection against such sales in other countries, where the protection afforded U.S. intellectual property rights is often grossly inadequate. In Japan, for example, it is virtually impossible for a U.S. semiconductor firm

THE PROBLEM OF CHIP PIRACY

[I]t may cost \$80 million to develop the complete family of chips. . . . The typical pirate will simply pick the high volume products and make photographic copies of these. He does not have to copy the entire family, only the main chip. A simple photographic copy of the main chip would only cost about \$100,000. The pirate has minimal research and development cost and virtually no market development cost. . . . He is simply interested in making a profit above his manufacturing cost of the chips that he copies. The pirate simply uses price as his weapon.

- F. Thomas Dunlap, Jr.
Corporate Counsel and
Secretary of Intel
Corporation,
August 3, 1983

to secure patent or other protection within a time frame which would make it meaningful as a means of protecting the U.S. firm's technology. Japan is considering, but has not yet adopted, chip protection legislation of the sort enacted by the U.S. Congress in 1984. If U.S. companies are to reap the competitive benefits of their technological leadership, a comprehensive effort to establish international safeguards for intellectual property will be required.

CONCLUSION

During the past decade the world has experienced intense trade friction and economic dislocation in certain industrial sectors, such as steel, shipbuilding and textiles, in which many nations simultaneously sought to pursue ambitious expansion policies. Semiconductors are rapidly emerging as such a sector in the mid-1980s as nation after nation concludes that it must develop or expand its indigenous microelectronics capability. Under such circumstances, trade friction and market disruption are a realistic possibility -- but they are not necessarily inevitable.

SIA's trade policy goals are intended to avert trade friction, preserve the maximum openness of international markets, and at the same time, to ensure a strong market position for U.S. producers, commensurate with their technological achievements. To summarize SIA's trade policy objectives:

1. This country should seek to preserve and expand openness of international markets while taking steps to avoid the dumping of semiconductors. Specifically, this may entail:
 - A renewed commitment from the Japanese government to open the Japanese semiconductor market to U.S. products.
 - Enactment of a successor law to Japan's Law No. 84 of 1978 which primarily emphasizes the liberalization of the Japanese economy, including the expansion of imports.
 - Reinforcement of the U.S.-Japan semiconductor trade data collection system established in 1983.
 - Negotiations with European nations and Korea designed to eliminate tariffs and ensure national treatment for U.S. products.

Multilateral trade negotiations focusing on the problems of international trade in high technology products.

2. This country should seek to secure international protection for U.S. semiconductor companies' intellectual property rights.

TAB 4

REPORT
ON
EXPORT CONTROLS

Semiconductor Industry Association

REPORT ON EXPORT CONTROLSIntroduction

The Semiconductor Industry Association ("SIA") represents a high technology industry vitally affected by export controls. Semiconductor manufacturers are particularly impacted by delays, expenses and lost business that is attributable to unnecessary and ineffective export controls. Because of the fast-changing markets for semiconductors, the large amount of capital needed for research and development and strong foreign competition, licensing delays and added administrative costs can negatively influence the industry's foreign growth potential and development of new products required to remain competitive.

In light of its critical dependence on exports -- over thirty percent of the industry's sales are overseas, SIA has evolved a number of principles which it believes should shape the essential features of the U.S. export control regime. Consistent with these principles, SIA has advocated a wide range of legislative and regulatory positions, many of which have been accepted by Congress and adopted by the Administration, that would streamline the licensing process. As a consequence of its analysis in developing regulatory and legislative provisions, the semiconductor industry accepts that many of its products have

potential military significance. SIA understands and accepts the need for effective control mechanisms in the western world to prevent diversions of militarily critical commodities and technology to potential adversaries of the United States and its allies.

What follows is a summary of SIA's approach to recent issues and its achievements as it continues to grapple with the sensitive and complex issues of export control.

Principles for an Effective
Export Control System

As a preliminary matter, it is useful to review the principles that SIA believes must be observed in establishing any system of export controls.

First, it is both futile and self-defeating for the United States to develop an extensive system of controls on products and technologies that are not mutually controlled and are therefore available from our principal allies and competitors. The United States, with very few exceptions, has no monopoly on militarily critical goods and technology in our industry. U.S. controls on exports of semiconductor products and technology (technical data and know-how), particularly those unilateral controls on exports to Free World destinations should not be imposed indefinitely when uncontrolled sources of comparable technology from other Western nations will eagerly fill the demand on a timely and

unrestricted basis. Western nations that meet this profile are mostly located in the Asian basin.

To overcome the problems posed by foreign availability, export controls should be imposed on a multilateral basis with our COCOM allies, Australia and New Zealand. A simultaneous effort should be made to obtain agreement from other friendly countries on a bilateral basis to ensure, to the extent possible, that these countries monitor and control exports and reexports in a manner consistent with COCOM controls. Effective export controls on products and technology must reflect agreement reached with our friends and allies. Unilateral controls by the United States impose significant competitive obstacles to U.S. industry and create difficulties in enlisting our allies' cooperation in an effective multilateral export control system. It behooves the semiconductor industry in those neutral countries where it has facilities to encourage the governments to cooperate on controlling exports to potential U. S. adversaries. According to press reports, some movement in this direction has already been made in India and Spain.

Second, any approach to the control of commodities and technology must be limited to items directly and significantly related to the military potential of a foreign country whose interests are adverse to U.S. national security. An overly broad definition of what is "militarily critical" leads to an inability to control truly sensitive items.

Many of the firms in the semiconductor industry have assisted in devising the Militarily Critical Technologies List ("MCTL). In its current form, however, the MCTL does not provide an appropriate compilation of militarily critical technologies, at least not for purposes of serving as an export control list. SIA is concerned that extensive new controls on the products, technical know-how and technical data of the semiconductor industry could stifle commercial research and development, and needlessly restrict the ability of U.S. firms to compete in trade with Free World countries.

Third, any change in controls should be based on the concept of permitting exports of even the most sensitive products and technology to reliable consignees and not on product or geographic limitations without regard to the parties involved. Allowing relatively free exports to reliable consignees will strengthen industry's competitive position and encourage private sector cooperation with export controls without reducing the ability to control sensitive products and technology.

Finally, a critical balance must be achieved in the export control regime. Export licensing must be sufficiently restrictive to control the exports of strategic goods and militarily critical technology while sufficiently flexible to allow U.S. companies to trade and compete in the Free World. SIA believes that this objective could best be furthered through bulk licensing mechanisms that take advantage of existing business justified commercial networks of control.

The alternative to bulk licensing--case-by-case licensing--raises the competitive costs for U.S. industry and increases the burden on an already over-loaded licensing system. By accommodating a series of specifically designed transactions and thus assuring the reliable flow of products and certainty of delivery to customers, bulk and multiple licensing mechanisms, such as the Distribution License, afford industry the operating flexibility it needs to compete internationally. Equally important, because they encourage the Government to assess in advance a company's export system rather than review numerous individual transactions, bulk licensing mechanisms offer the best prospect for effective national security control.

Recent regulatory proposals imposing greater reliance on individual transactions are misdirected. Rather than being cut back, bulk licensing arrangements for commodities and technology should be encouraged and should focus primarily on the competence of the exporter, its system of control and the reliability of the foreign consignee.

Recent Developments
Concerning Export Controls

In representing its members before Congress and the Administration, SIA has consistently advocated adherence to the basic principles set forth above. During the past year, there have been a number of legislative and regulatory developments in which SIA has been involved.

Legislative Initiatives

SIA has been at the forefront of a number of successful legislative initiatives during the past three years in the national security area that have resulted in corresponding changes in the regulatory process by the Administration.

Distribution License - Congressional agreement to a provision requiring Commerce to focus the distribution license procedure on the reliability of the exporter and its foreign consignees and imposing requirements for Commerce to justify changes in the distribution license procedure led to Commerce significantly revising the proposed regulations published in January 1984 and discussed below;

Comprehensive Operations License - New Commerce Department proposals to revise technical data regulations provide for bulk licenses that incorporate, in a limited form, many of the concepts adopted by both the House and Senate in legislative provisions advocated by SIA calling for the creation of the Comprehensive Operations License;

COCOM Licensing - Legislative provisions agreed to by both the House and Senate establishing limited licensing review periods for transfers of certain commodities to COCOM countries prompted the implementation of so-called "fast track" licensing procedures for Free World applications by the Commerce Department; and

Embedded Microprocessors - Although the gains in this area have apparently been reversed by the new regulations implementing the 1984 COCOM agreement, strong House and Senate support of a legislative provision decontrolling items controlled solely because they contained an embedded microprocessor encouraged the Commerce Department to decontrol by regulation a wide range of medical and other electronic devices containing embedded microprocessors.

Although no export control legislation has been enacted in the last few years, these initiatives have generated a broad based consensus in Congress, the Administration and industry.

Regulatory Activities

Amendments to Distribution License Procedure - In January 1984, the Commerce Department published new proposed regulations that would severely restrict use of the Distribution License. The Distribution License authorizes U.S. exporters to make multiple shipments to Free World destinations of medium-level technology items over an extended period. Under the Distribution License procedure an exporter need not apply for and obtain a license for each individual transaction. Rather an exporter's distribution system is pre-cleared so that the U.S. exporter can make repetitive shipments quickly and predictably. The distribution license mechanism is vital because SIA members depend on the Distribution License as their principal vehicle for licensing exports.

In conjunction with efforts by other associations representing other sectors of the high-technology industry, SIA took active steps to redirect the Commerce Department's efforts away from restricting distribution license procedures. This effort has produced results. The Commerce Department published significantly revised regulations in September 1984 taking into account many of the objections raised by SIA in its public comment. Nevertheless, the new proposed regulations continue to raise significant concerns for exporters of semiconductors. SIA, in alliance with the Semiconductor Equipment and Materials Institute, Inc. ("SEMI"), submitted written comments to the new proposals addressing these concerns and testified at Commerce Department hearings throughout the country.

SIA is optimistic that the final regulations will embody many of its proposals. It welcomes the prospect for more reliance on internal or proprietary control systems, clear delineation of management responsibility, and longer duration of licensing terms. On the other hand, SIA remains concerned about the geographic and product scope of the distribution license, the tendency of Government officials to seek to impose arbitrary or uniform control systems, and the design of audit procedures.

Proposals to Revise Technical Data Regulations

The Commerce Department also has disseminated informally new proposals to revise controls on technology transfers, that is,

technical data and know-how. These proposals would impose new unilateral validated license requirements on a significant portion of technology transfers to Free World countries that currently qualify for transfer under general license authority.

As a partial response to these new regulatory proposals, SIA was primarily responsible for the development of the Comprehensive Operations License ("COL"). By focusing on existing corporate controls on proprietary information, the COL represents a more stringent licensing mechanism for technology transfer than exists in current regulation but is designed not to burden the Free World operations of U.S. companies. The Comprehensive Operations License could accommodate the special characteristics of high-technology industry with a minimum of interference. It also has the advantage of allowing Government to build upon a corporation's existing network of business justified, self-imposed, self-patrolled controls on the export of sensitive technology to protect trade secrets. No high technology company can stay in business for long without a sophisticated system of internal controls on its technical know-how.

Through its participation in the Industry Coalition on Technology Transfer ("ICOTT"), SIA has developed other responses to the Commerce proposals. In addition, ICOTT's Working Group on Technical Data Regulations is developing alternatives to these

Commerce proposals and refining SIA's original proposal for implementing a Comprehensive Operations License.

New Controls on Software

The Government has taken an additional step in imposing new controls on technology transfers by implementing new COCOM and unilateral United States controls on software. New regulations, published on December 31, 1984 and effective as of January 1, 1985, implement an agreement reached by COCOM in July 1984. For the first time, the COCOM agreement controls transfers of software to East Bloc countries and the People's Republic of China, independent of related commodities.

The U.S. regulations, however, go further than the COCOM agreement and impose controls on transfers of designated software (i.e. CAD/CAM software, network software and software analysis tools) to Free World countries. These regulations continue a disconcerting pattern by U.S. authorities of imposing unilateral controls on exports to Free World countries. Because of the significant concerns raised by industry, Commerce has granted an additional 90 day grace period for all transfers of software, as well as equipment containing embedded microprocessors, that would have qualified for general license treatment before December 31, 1984. SIA is continuing its efforts, in conjunction with other trade groups, to resolve the confusion over the new regulations.

Delays in Processing Applications for
Exports to the People's Republic of China

COCOM also has played a prominent role in the extent to which SIA members have been able to export to the People's Republic of China ("PRC"). Efforts by the Reagan Administration to normalize relations with the PRC have opened to a significant degree the market for semiconductors. American businessmen are aggressively competing to gain their share of the PRC market.

The export licensing system, however, has not been as successful in dealing with the opening of the PRC market. The Commerce Department and COCOM have been inundated with applications to export advanced technology and equipment to the PRC. Applications caught in this flood have taken an inordinate and unpredictable number of months to receive final approval.

SIA has expressed its concerns that licensing delays of this nature damage U.S. industry's reputation as a reliable supplier to the PRC. Industry efforts to initiate government action on this problem have already begun. In fact, one of the major topics at a high-level COCOM meeting held in Paris at the beginning of February was development of an expedited system in COCOM to process applications for the PRC.

Conclusion

SIA has been in the forefront of proposals to develop a workable export control system. By seeking to achieve its goals,

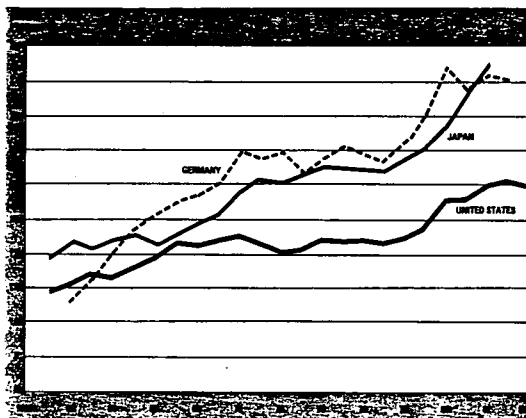
SIA believes that U.S. high technology can be protected from diversion to potential adversaries without undermining the vitality of U.S. high-technology industry. Undoubtedly this will require an energetic effort to assure that proposed regulations are manageable and not unduly burdensome; not a crisp or glamorous task but certainly a critical one.

THE CHALLENGE IN INNOVATION AND PRODUCTIVITY

The United States currently spends more on R&D than Japan, France, and Germany combined; however, roughly half of America's R&D is performed by the Federal Government and two-thirds of this is spent on defense and space programs. While in the past there have been significant innovations from defense and space R&D that have spilled over into the commercial sector, most notably the advances in integrated circuits made during NASA's early days, our current military and space R&D has shifted towards areas with virtually insignificant commercial applications. Thus, in assessing competitiveness, it is the level of civilian R&D that is the most relevant figure, and by that measurement, the United States falls significantly behind our competitors.

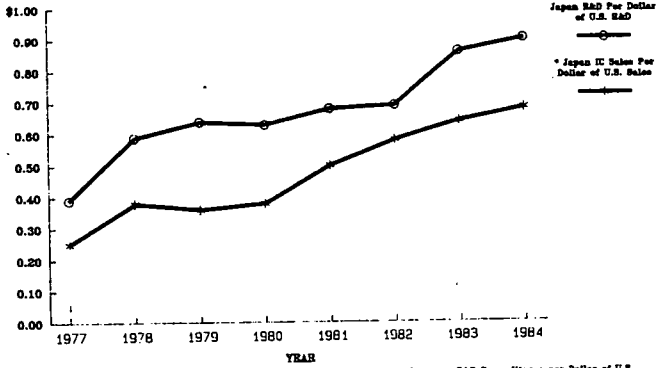
In the semiconductor sector, R&D is the lifeblood of the industry. According to the Business Week survey on R&D, the U.S. semiconductor industry spent 8.3 percent of sales on R&D in 1983, a 21% increase from 1982 and the highest percent of sales devoted to R&D of all industries surveyed. This high level of R&D has resulted in the quadrupling of the density of transistors in successive generations of semiconductor chip products every four years. Despite this high level of R&D, there is the danger that the U.S. merchant industry's R&D effort will be surpassed by the Japanese industry.

CIVILIAN RESEARCH AND DEVELOPMENT EXPENDITURES AS A PERCENT OF GNP



Source: Report of the President's Commission on Industrial Competitiveness

RESEARCH & DEVELOPMENT



SOURCE: DATAQUEST, JAPAN ECONOMIC JOURNAL,
ASA INC., SA

Japanese R&D Expenditures per Dollar of U.S.
R&D Expenditures
* Japanese IC Sales per Dollar of U.S. IC Sales

THE ECONOMICS OF R&D

Our economy is predicated upon the assumption that the marketplace generally offers the best allocation of private resources. This is because individuals who are closest to a decision situation, and hence most knowledgeable about the costs and benefits of a particular investment, are more likely to allocate resources efficiently than is any other individual or group including the government. Further, individual businesses have the incentive to make the most efficient resource allocation because they have the most to gain or lose by the decision. In a competitive marketplace, consumers' needs are met because they receive goods and services at the lowest possible price, namely the marginal cost of producing the good or service.

Relying on the marketplace to allocate resources to research and development shares the general marketplace advantages in that the business person is accountable to the firm's shareholders for effectively performing R&D, and the business person is best able to weigh the potential for technical success with the potential consumer demand for the resulting product. However, reliance on the market for allocating resources to R&D does not lead to a socially optimum result because even if a business, after years of expensive and risky R&D, is successful in developing a new product, that business cannot capture all of the benefits of the R&D. This "appropriability" problem is due to competitors copying or "reverse engineering" the new technology, R&D personnel leaving the firm for competitor companies or to start their own firms, or competitors improving on the new technology to develop competitive products. A conservative estimate by Professor Edwin Mansfield of the University of Pennsylvania finds that the social rate of return for innovation is twice that of the private rate of return. In other words, a business that invests in R&D is likely to capture only half of the benefits that accrue from the R&D. While certainly having technology spilling outside the innovating company is not all bad, it does have the effect of causing businesses to invest less in R&D than is optimum for the larger society.

A second characteristic of R&D that causes the marketplace to undervalue R&D is the inherently risky nature of research. Often the only commercially valuable knowledge resulting from an R&D project is that the tested method does not work. While larger companies can more successfully balance their "portfolios" of research projects to increase the chances of yielding at least one major success, even they can only afford a limited number of large R&D projects. Thus, the riskiness of R&D leads firms to invest less in R&D than is socially optimum, determined at a level where the aggregating of R&D across society eliminates the riskiness of a single R&D project.

Government has a legitimate role in increasing the "capture ratio" or otherwise acting to narrow the gap between the private

sector's ability to assume risk and the socially optimum level. The methods described in this paper include the R&D tax credit; direct government grants; encouraging joint R&D; and improving the protection of intellectual property, both domestically and internationally.

R&D TAX CREDIT

The 1981 Economic Recovery Tax Act provided a tax credit for increased research activities equal to 25% of the increase in the taxable year over an average of the prior three years (the base period). This credit is scheduled to expire on December 31, 1985.

Two studies have been released in 1985 supporting the extension of the R&D credit. A study by individuals at the Brookings Institution and Data Resources, Inc. has quantified the social benefits of the R&D credit as adding between \$2.9 to \$17.7 billion annually to GNP by 1991. A January, 1985 study by the Congressional Research Service of the Library of Congress, recommends making the credit permanent because "To make the credit temporary introduces additional risk into the firm's calculations, because of the uncertainty of obtaining the credit."

Japan has had an R&D tax credit since 1966 that is equal to 20 percent of the excess of current year R&D expenditures over the highest R&D spending level incurred in any year since 1973. MITI has proposed that the Japanese Diet expand this credit to 30% as part of the Technology Promotion Law. Further, Japanese tax allows capital R&D expenditures to be depreciated at more rapid rates than ordinary useful lives for other types of investment.

Two companion bills, S. 58 (Danforth-Bentsen) and H.R. 4475 (Pickle-Frenzel-Matsui), have been introduced to make the credit permanent, clarify the definition of "qualified research" for credit purposes, allow startup companies to use the credit, expand credits for company contributions to university basic research, and enhance the deduction for corporate donations of scientific equipment to post secondary institutions. The Treasury Department's tax simplification proposal endorses a three year extension of the R&D credit.

Legislation to make the credit permanent must be passed immediately to allow companies to plan their R&D expenditures for future years. The R&D tax credit has provided the incentives to maintain America's technological edge, and thus the credit must be made a permanent part of the tax code. America must encourage basic research and scientific and technical education in order to remain competitive internationally, and the provisions in S. 58 - H.R. 1188 facilitate this. SIA strongly supports this legislation.

DIRECT GRANTS

The R&D credit should not replace direct government support for R&D, but rather should be a complimentary strategy to increase our country's level of R&D efforts. There are three areas where government must support R&D because the private sector's efforts are wholly inadequate. The first is support of basic R&D, where the capture ratios for business are small and hence the incentives to devote resources are few. The second is support of "generic" research. This category of R&D can be readily applied, but the industrial applications are so general that no single company has an adequate capture ratio to justify much R&D in the area. An example of generic research is studying the nature of friction. A final category of direct government involvement is in R&D for public purposes. R&D for defense is the most apparent example.

Whereas in private R&D, firms are seeking to increase their capture ratio in order to maximize their return on investment, in government-funded R&D the objective should be the opposite. To increase the rate of technology transfer between Federal labs and the private sector should be a specific mission of the Federal labs.

JOINT RESEARCH

Prior antitrust laws deterred U.S. semiconductor firms from engaging in joint research and development ventures, since a venture that was determined to have negative competitive effects was illegal, and the participants were subject to criminal and civil penalties. Legal uncertainties and the possibility of differing court interpretations meant that U.S. firms choosing to engage in joint research ventures under the prior laws were risking liability for treble damages. Rather than take such risks, individual semiconductor manufacturers duplicated research, an excessive cost reaching millions of dollar per firm in terms of the opportunity lost of the alternative use of the funds, such as capital investment in modernized or expanded plant. Passage of the National Cooperative Research Act, in late 1984 sponsored by Representative Rodino in the House and Senator Thurmond in the Senate, has encouraged joint R&D ventures by greatly clarifying the law by establishing the rule of reason test rather than the per se illegality test, by establishing that successful defendants can collect attorneys' fees from plaintiffs who file unreasonable suits, and by limiting the damages plaintiffs can collect to the actual damages suffered instead of treble damages.

Many of America's foreign competitors have long pooled their R&D resources, often with the assistance and guidance of their governments. Japanese companies, for example, have effectively pooled R&D resources for years under the auspices of the Ministry of International Trade and Industry (MITI) and Nippon Telegraph and Telephone (NTT). The SIA study entitled The Effect of

Government Targeting on World Semiconductor Competition (1983)
documented examples of these activities, such as the VLSI Project, which organized the research talents of NEC, Hitachi, Toshiba, Fujitsu, and Mitsubishi.

The European countries also have a history of promoting joint R&D. Their current effort is a \$1.3 billion matching fund program called European Strategic Program for Research and Information Technology (ESPRIT), which will define a set of research themes and assign companies, academic institutions, and government laboratories to participate. Advanced semiconductor products and processes have a high priority in this multilateral effort. Meanwhile, U.S. antitrust laws deterred our own firms from engaging in similar activities except under the rubric of defense. The ultimate result of such prohibition is a competitive disadvantage for U.S. firms in the worldwide marketplace.

The benefits of joint research convinced the U.S. semiconductor industry to form the Semiconductor Research Corporation (SRC) in 1981. Headquartered in Research Triangle Park, North Carolina, the SIA affiliate uses its \$12 million annual operating budget to grant funds to universities for basic semiconductor research. The results of such research are made available to the SRC membership for subsequent competitive product applications. Among the projects currently being funded by the SRC are computer aided design for semiconductor layouts, advanced electron beam systems for processing new generations of VLSI, and materials science research on submicron devices. To date, the SRC has been very successful in performing research that otherwise would not have been done.

A second joint research effort is the Microelectronics and Computer Technology Corporation (MCC), in Austin, Texas. Although the MCC is not affiliated with the SIA, several SIA member companies have become involved. This program has a broader scope than the SRC addressing the several technological areas necessary to develop the very advanced computer systems of the future.

INTELLECTUAL PROPERTY

The President's Commission noted that "If developers of a new technology cannot be assured of gaining adequate financial benefits from its commercialization, they have few incentives to make the huge investments required." In the case of semiconductor designs, however, intellectual property protection was inadequate under existing copyright and patent laws until the passage of the Semiconductor Chip Protection Act of 1984. This did provide generic protection, similar to copyright law, for chip designs in the United States market from the date of first commercial production. Foreign designers are protected only if their home countries afford reciprocal protection to American firms marketing their products abroad.

In most nations today, the status of chip design protection remains cloudy, and much needs to be done to expand the protections enacted in the U.S. to other countries. The U.S. Government should encourage foreign nations to enact laws to protect semiconductor chip designs. In addition to qualifying for reciprocal protection under U.S. laws, such enactment by foreign governments will provide incentives for their nationals to develop proprietary chip designs and will encourage U.S. companies to license their state-of-the-art designs to local manufacturers. The Government of Japan is developing its own law in this area, and other nations which produce or consume semiconductors -- particularly Korea, Taiwan, the ASEAN nations, and the member states of the European Community -- will undoubtedly be considering such laws in the near future. These laws should be consistent with the principles of the United States Semiconductor Chip Protection Act. The SIA is dedicated, through the U.S. Government, to actively encourage the adoption of laws similar to the U.S. act in all other electronic manufacturing and consuming nations of the Free World.

Ultimately, an international treaty should be developed to forge a consensus on the need to protect chip designs from piracy. The World Intellectual Property Organization (WIPO) is considering the creation of such a treaty. In this regard, SIA was also pleased to hear President Reagan's call in the State of the Union Address for inclusion of intellectual property in the upcoming GATT negotiations.

In addition, U.S. antitrust laws as they apply to licensing practices should be revised to promote the use of intellectual property once it is developed. In particular, licensing tie-in should not be considered per se illegal, but should be judged under the rule of reason and encouraged if they are found to be pro-competitive. At the same time, the courts should be directed to find actual harm to competition before denying enforcement of exclusive rights granted under the patent and copyright laws. By encouraging the licensing of innovative products, the United States Government makes it possible to bring more innovative products to market and thereby encourages increased innovation.

Finally, United States patent laws should be modified to enable the holder of a U.S. process patent to prevent the importation of products made overseas in violation of that process patent. By better protecting this form of intellectual property, this law would encourage innovation utilizing process patents.

EDUCATION & TECHNICAL PERSONNEL

The President's Commission cites the need to "develop a more skilled, flexible, and motivated work force." Already, the United States lags far behind Japan in the number of new engineers it graduates each year per capita. Nowhere is the shortage of technical personnel more acute than in the semiconductor industry.

To address this problem, the SIA formed the Semiconductor Research Corporation (SRC), which today supports over 300 faculty members and students in U.S. universities to pursue fundamental research goals that are responsive to the needs of the industry. A corollary benefit of the SRC projects is that more electrical engineering undergraduates will be motivated to pursue graduate research activities and more promising young professors will be motivated to seek tenured research positions instead of alternative careers in the commercial sector. The R&D credit, mentioned above, also includes a credit for company grants to universities to perform R&D and a credit for company donations of scientific equipment.

SIA strongly endorses measures to strengthen education on all levels in the U.S., particularly in scientific and technical disciplines. Special emphasis should be placed in university engineering school curricula on manufacturing engineering with the long range efforts of higher quality performance in U.S. manufacturing industries and more rapid conversion to commercial products. Further, United States immigration policy should permit foreign workers whose technical expertise is not available in sufficient supply among U.S. nationals, to remain in the United States indefinitely.

ENGINEERING GRADUATES FOR SELECTED COUNTRIES, 1982

| Country | First University Degree | |
|----------------|-------------------------|---------------------|
| | Total | Per 100,000 Persons |
| Japan | 71,888 | 82 |
| West Germany | 6,888 | 11 |
| United Kingdom | 18,320 | 18 |
| United States | 87,488 | 28 |
| France | 11,888 | 22 |

Source: National Science Foundation, International Science and Technology Data Update, unpublished

CONCLUSION

The United States has made significant strides to facilitate the efficient allocation of R&D in our marketplace. Due to initiatives such as enacting the National Cooperative Research Act and the Semiconductor Chip Protection Act of 1984, the government has taken steps to increase the capture ratio of civilian research. As the industry increasingly faces stiff foreign competition, the government must strengthen its efforts to enhance the competitive environment. The R&D tax credit must be extended, joint research must be encouraged, our intellectual property laws must be emulated overseas and our institutions of engineering learning must be strengthened. SIA calls attention to these issues because the power lies in Washington to see them resolved in favor of an industry.

THE NEED FOR A
PERMANENT TAX CREDIT
FOR INDUSTRIAL RESEARCH AND DEVELOPMENT

An Economic Assessment

Prepared By

Martin Neil Bally, Robert Z. Lawrence
and
Data Resources, Inc.

February 1985

Commissioned By: The Coalition For The Advancement
Of Industrial Technology

EXECUTIVE SUMMARY

The value of government efforts to stimulate private research and development (R&D) activities is demonstrated by considering the process of innovation in our society.¹ Benefits from commercial research quickly spread throughout the economy, improving the quality of life, worker productivity, and real Gross National Product.

Yet for individual firms, R&D activities are inherently risky and the rewards are normally impossible to capture fully. For these reasons, Congress enacted an R&D tax credit in 1981. This study analyses the efficacy of the credit but goes beyond prior analyses in that it assesses the impact of the credit on the national economy as a whole, not just its effect on individual private R&D spending.² For the first time, a dollar

1 The study summarized below was conducted by Martin Neil Baily and Robert Z. Lawrence of the Brookings Institution and Data Resources Inc. It was commissioned by the Coalition for the Advancement of Industrial Technology, a broad-based group of private corporations, universities, industry associations, and independent research laboratories. The research and analysis were performed independently of Brookings and of the Coalition, and the results and conclusions are those of the authors alone.

2 Previous efforts to quantify the impact of the R&D credit have been limited to identifying the amount of additional R&D investment generated by the credit, as distinguished from the total benefits produced by the new investment. To reach these estimates of total benefits, the study draws on state-of-the-art academic analyses, to obtain estimates: of the social return to R&D investments; of the "average effective rate" or monetary value of the R&D

estimate is assigned to the additional GNP that the R&D tax credit is likely to generate.

To evaluate the effect of the R&D tax credit more completely, this study presents both a very conservative and a "best-case" scenario.

-Under the most conservative assumptions, a permanent R&D tax credit would generate an extra \$1.2 billion a year by 1986 in real GNP and \$2.9 billion in 1991.

-Under the "best case" scenario, but nevertheless reasonable given past gains from technological breakthroughs, an R&D tax credit would yield \$7.5 billion in annual GNP increases in constant dollars by 1986 and \$17.7 billion by 1991. GNP increases of these magnitudes would produce taxable revenues that should more than offset Treasury revenue losses due to the R&D tax credit.

The Need for Accelerating R&D. Private R&D activities are particularly vital to our economy at this time:

-Since the early 1970s (from 1973 to 1981), productivity gains dropped to an annual average rate of just 0.7%, compared to about 3% over the 1948-73 period. Also during the 1970s,

Footnote continued

credit for individual companies; and, of the "price elasticity" or percentage increase in R&D spending attributable to the credit.

the growth rate of total industrial R&D spending was sharply lower than in the previous decade. Continued and increased R&D spending is necessary to ensure a prolonged recovery in U.S. productivity performance.

-High tech exports are increasingly important and accounted for almost 30% of U.S. merchandise exports in 1982, up from 24% in 1970. The U.S. trade balance in high tech products rose between 1970 and 1980 from \$6.1 billion to \$25.5 billion, although by 1982 it had fallen back to \$17.5 billion.

-There is ample evidence that the American technological lead over competitors is not as great it once was. Japan and Germany, in particular, have increased their civilian R&D efforts at a faster pace than has the United States. Japan and the European Community nations have accelerated direct funding of commercial R&D projects. Japan has had an incremental R&D tax credit since 1966, as well as other incentives to encourage investment. Comparatively, the U.S. has devoted the lowest share of GNP to civilian R&D of France, Germany, Japan, the United States, and the United Kingdom.

Conclusion. The R&D tax credit adopted in the Economic Recovery Tax Act of 1981 has been in effect during a period of impressive increases in R&D spending. Investment in private R&D began to pick up in the late 1970s as oil prices were high and energy-related research was encouraged. Private R&D

remained high into the 1980s and even climbed further despite the subsequent drop in oil prices and the deep recession of 1982. (This performance is in sharp contrast to past recessionary periods, when R&D spending levels consistently fell.)

The findings and analysis presented in this report support a continuing government role in fostering private R&D activities. The R&D tax credit enacted in 1981 increased commercial R&D investment. Without Congressional action, the credit will expire at the end 1985. Without this added incentive, as the report confirms, private companies will spend less on their R&D than is in our country's best interests. A permanent R&D tax credit should therefore be enacted.

Senator BENTSEN. Mr. Myrick, I spent the weekend reading that report by the President's Commission on Industrial Competitiveness. I thought it did have some good points in it. I have a responsibility working with the Commission as the chairman of a Democratic working group on trade, so I'm trying to get as much as I can from the Commission's studies. There are a number of excellent recommendations there; a number of them which haven't been adapted by the administration either, at least thus far. I hope they are adapted and the sooner the better.

We'll move on to the other witnesses and then I'll get back to some questions. Mr. Bowen, would you state your position. And we are very pleased to have you here this morning. Proceed with your statement.

STATEMENT OF C. MICHAEL BOWEN, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, INTECOM, INC., ALLEN, TX, ON BEHALF OF THE AMERICAN ELECTRONICS ASSOCIATION

Mr. BOWEN. Thank you very much, Senator. My name is Michael Bowen. I'm chairman of the board and chief executive officer of Intecom, Inc., in Allen, TX.

I'm privileged to be here today to testify at these very important hearings on behalf of the American Electronics Association, an association that has over 2,700 high technology electronics companies. The stake which all AEA members have in international trade is enormous, whether they are actively promoting their products overseas or competing with foreign suppliers in the very open U.S. market. Therefore, allow me to take this opportunity to thank you, Senator, and all the members of the JEC for calling attention to this topic and allowing the AEA to articulate its views.

The U.S. trade balance in electronic-based products has virtually reversed in recent years. This change has been so dramatic that in 1984 the United States witnessed its first-ever trade deficit in electronic-based products. While as recently as 1980, we enjoyed a trade surplus of \$7.4 billion; in 1984, we experienced a worldwide net deficit of \$6.8 billion. International trade and particularly the ability to export is critical to the health of the U.S. electronics industry. This industry in turn is critical to our Nation's broad economic health and especially to our national security.

Since the 1978 reduction in capital gains taxes which you, Senator, thank you, were instrumental in securing, the electronics industry has become the largest employer of any manufacturing industry in the United States. We now employ over 2½ million Americans. In Texas alone, the industry employs 131,000 people, the fourth largest electronics employment of any State. AEA's figures indicate that every billion dollars in sales produces approximately 11,000 jobs. Had our historic trade surplus held steady in recent years, the electronics industry would have employed an additional 156,200 workers.

Texas alone might have employed an additional 3,250 workers.

Our new deficit in electronics trade is caused by a number of factors. For example, the overly high dollar handicaps our firms trying to export and acts the same as a subsidy for foreign firms competing in our market. The fact that the U.S. economy has

grown more rapidly than other economies is a major reason why imports have increased over 150 percent since 1980, and overregulation in the export control area has clearly been a major factor in holding down the increase in U.S. exports to less than 50 percent. The continuing high cost of capital in the United States also keeps our exporters at a disadvantage compared to our trading partners.

However, foreign trade barriers are also a major cause of our trade deficit. While it is basically impossible to estimate exactly how much greater U.S. exports would be if we had access to other markets comparable to what we give other nations, the number would clearly be very, very large.

Allow me now to turn to telecommunications equipment, an area very close to our heart in Allen, TX.

As you know, trade in this particular area has traditionally been highly restricted. The U.S. market is wide open. Our tariffs are very low. Nontariff barriers are virtually nonexistent and our consumers are fully amenable to purchasing foreign-made goods. Particularly since deregulation of our market, and this recent divestiture of AT&T which was accomplished in a totally nondiscriminatory manner, access to our market by foreign firms is total.

The situation in most foreign markets, by contrast, is radically different. While there are some signs of change, most foreign markets where there is domestic production are virtually closed to U.S. exporters. Clearly, telecommunications today is an area where U.S. technology leads the world. If we had reciprocal access, I'm convinced we would have a significant trade surplus in telecommunications, not the deficit of over \$640 million that we experienced in 1984. In this area, market access is key.

At the present time, Japan is key to our trade situation in telecommunications. In the first instance, Japan is the second-largest market in the world, with 1983 consumption of \$5 billion. Obviously the ability to sell in the world's second-largest market would directly help the U.S. export balance.

More importantly, however, Japan represents the greatest competitive threat in the U.S. market. With our wide open market, U.S. imports of communications products from Japan rose from \$602 million in 1980 to over \$2 billion in 1984. Allowing Japanese producers to compete freely in our market while we cannot sell there is to tie one hand behind our back.

Although the Japanese Government committed to providing market access in telecommunications over 5 years ago, our sales opportunities to date have been limited. The current restructuring of the Japanese market presented a magnificent opportunity for the Japanese ministries to implement their country's commitment to free trade. In spite of this, initial proposals for restructuring almost certainly would have severely limited imports into the Japanese market. We only learned of the initial proposals through extensive digging, and we were never and still aren't completely sure of what is being considered.

Frankly, our impression has been that even today, midlevel bureaucrats in Japan are not committed to a really open market. To deal with the problems in the proposed regulations, U.S. negotiators had to be stationed in Japan full time for about a month, in addition to the need for repeated visits by the U.S. team headed by

Under Secretary Olmer and Ambassador Smith. The U.S. representatives did a truly impressive job and they literally worked around the clock. However, we believe this process would not have been necessary if Japan had clearly begun with the articulated objective of fully opening its market and the process of legislation and rulemaking had been transparent.

The best measure of market access during the months ahead will be the extent to which American companies are actually able to compete and actually able to sell in the Japanese marketplace. The logic of this particular approach lies in the competitive posture of American telecommunications suppliers in comparison with their Japanese counterparts. That is to say, if American telecommunications suppliers are able in the near term to get substantially equivalent competitive opportunities in Japan, we fully believe they will substantially increase the number of sales they are making above and beyond the current levels.

Since Japanese products are no more competitive in telecommunications areas as a whole than are U.S. products, it is reasonable to assume that our import penetration level will be the same as theirs, if their market were fully open. In such an event, we believe Japanese imports of American equipment would have been over \$400 million higher in 1984 than they actually were. Moreover, with the anticipated explosion in telecommunications technology, this market could triple by the end of the decade.

U.S. firms need to be able to manufacture their products in Madison, WI, or Allen, TX, and sell them in Japan if the products are price and quality competitive. This means formal barriers have to be removed and informal barriers have to be minimized. In order to ensure that this is done, the current discussion should not end on April 1. Rather, I would urge that U.S. Government representatives continue the dialog beyond April 1, in order to identify problems which American companies are encountering in Japan in the new regulatory environment, and address them immediately.

Thank you, Senator. I'll be happy to answer any questions that you might have.

[The prepared statement of Mr. Bowen follows:]

PREPARED STATEMENT OF C. MICHAEL BOWEN

Mr. Chairman, my name is Michael Bowen and I am Chairman of the Board and Chief Executive Officer of Intecom, Inc. in Allen, Texas. I am privileged to be here today to testify at these important hearings on behalf of the American Electronics Association, an association with over 2,700 high tech electronics companies. The stake which all AEA members have in international trade is enormous, whether they are actively promoting their products overseas, or competing with foreign suppliers in the very open U.S. market. Therefore, allow me to take this opportunity to thank you, Mr. Chairman, and all the members of the Joint Economic Committee for calling attention to this topic and allowing the AEA the opportunity to articulate its views.

Trade in Electronics-based Products

I would like first to relate some general information on

international trade in the electronics industry, and then focus my testimony on a sector in which my own experience is the greatest, namely trade in telecommunications equipment. Because of the importance of Japan in our telecommunications trade and the critical nature of the current U.S. Government-Japanese talks in this area to the future of our industry, I propose to focus largely on Japan.

Mr. Chairman, the U.S. trade balance in electronic-based products has reversed in recent years. This change has been so dramatic that in 1984 the U.S. witnessed its first ever trade deficit in electronic based products. While as recently as 1980 we enjoyed a trade surplus of \$7.4 billion, in 1984 we experienced a world wide net deficit of \$6.8 billion.

During this period, the trade picture for all major segments of the electronics industry has deteriorated; the 1980 trade deficit in consumer products and office products increased significantly; 1980 trade surpluses in components and communications became deficits in 1984; and our surpluses in computers and instruments were reduced.

International trade -- and particularly the ability to export -- is critical to the health of the U.S. electronics industry. This industry, in turn, is critical to our nation's broad economic health and to our national security. Since the 1978 reduction in capital gains taxes, which you Mr. Chairman were instrumental in

securing, the electronics industry has become the largest employer of any manufacturing industry in the U.S. We now employ over 2.5 million Americans. In Texas alone, the industry employs 131,000 people, the fourth largest electronics employment of any state.

AEA's figures indicate that every billion in sales produces 11,000 jobs. Had our historic trade surplus held steady in recent years, the electronics industry would have employed an additional 156,200 workers. Texas alone might have employed an additional 8,250 workers.

More important than this direct employment effect, however, is the contribution that high technology electronics makes to our economy as a whole. Electronics is contributing to a revitalized competitiveness in a broad range of other industries, for example autos, and the rapid growth of many service industries is attributable to our strong telecommunications network and new computer technology. Additionally, as you well know, the electronics industry is vital to our defense program, which relies increasingly on technology, not manpower.

Sources of the Trade Deficit

Our new deficit in electronics trade is caused by a number of factors. For example, the overly high dollar handicaps our firms trying to export, and acts the same as a subsidy for foreign firms competing in our market. The fact that the U.S. economy

has grown more rapidly than other economies is a major reason why imports have increased by over 150 per cent since 1980. And over-regulation in the export control area has clearly been a major factor in holding down the increase in U.S. exports to less than 50 per cent. The continuing high cost of capital in the U.S. also keeps our exporters at a disadvantage compared to our trading partners.

However, foreign trade barriers are also a major cause of our trade deficit. While it is basically impossible to estimate exactly how much greater U.S. exports would be if we had access to other markets comparable to what we give other nations, the number would clearly be very large.

Telecommunications Trade

Allow me to turn now to telecommunications equipment, an area very close to our heart in Allen, Texas. As you know, Mr. Chairman, trade in this particular area has traditionally been highly restricted. The U.S. market is wide open: our tariffs are very low, non-tariff barriers are virtually non-existent and our consumers are fully amenable to purchasing foreign-made goods. Particularly since deregulation of our market and divestiture of AT&T, which was accomplished in a totally non-discriminatory manner, access to our market by foreign firms is total.

The situation in most foreign markets, by contrast, is radically different: While there are some signs of change, most foreign

markets where there is domestic production are virtually closed to U.S. exporters.

Clearly, telecommunications today is an area where U.S. technology leads the world. If we had reciprocal access, I am convinced that we would have a significant trade surplus in telecommunications, not the deficit of over \$640 million that we experienced in 1984. In this area, market access is key.

Because so many foreign markets are virtually closed to imports, resolving the inflated dollar would not solve all the problems. Even if the dollar were significantly lower in value, say 4 francs or 100 yen to the dollar, instead of today's rates of 10 francs and 260 yen to the dollar, U.S. suppliers would still have difficulty because of restrictions. While the dollar is not the major factor impeding exports of telecommunications products, obviously the exchange rate does affect price sensitive products in the U.S. that compete with imports. However, on the export side, even with the over-valued dollar, given U.S. technology, we could more than off-set current import surges, if we had access to other markets.

At the present time, Japan is key to our trade situation in telecommunications. In the first instance, Japan is the second largest market in the world, with 1983 consumption of \$5 billion. Obviously, the ability to sell in the world's second largest market would directly help the U.S. export balance.

More importantly, however, Japan represents the greatest competitive threat in the U.S. market. With our wide open market, U.S. imports of communications products from Japan rose from \$602 million in 1980 to over \$2 billion in 1984. To underline the importance of Japan in our market, in 1984 Japan accounted for 49.5 per cent of total U.S. imports of communications products. We need to be afforded market access so we can engage Japanese producers on their home turf, in order to understand our competitive challenge. Allowing Japanese producers to compete freely in our market while we can not sell there is to tie one hand behind our back.

Finally, Japan has committed itself to an open market. The U.S. negotiated for this commitment in the trade talks that concluded in the late 1970's and early 1980's. As an example of this commitment, which our industry takes very seriously, Dr. Okito, the then Government Representative for External Economic Relations, wrote to the USTR in December 1980:

"It is the policy of the Government of Japan to provide nondiscriminatory and competitive opportunities in its procurement operations and to guide Government-affiliated agencies such as the Nippon Telegraph and Telephone Public Corporation to do likewise. It is our objective to achieve an open, transparent telecommunications market."

Japan's commitments are also specifically set out in the NTT agreement that Japan and the U.S. agreed to in 1981, and then

extended for three years in 1984. This agreement was reached because the U.S. opened much of the government procurement market to Japan under the procurement code negotiated in the Tokyo Round, while Japan's commitments were significantly less; accordingly, the NTT Agreement was designed to achieve a fair balance.

We particularly value and welcome Japan's commitment for an open telecommunications market because many other countries have refused to negotiate in this sector. We believe that free and open trade contributes to growth in this area, and to a dynamism that protectionism stifles. We believe that as Japan opens its market, its economy and consumers will benefit.

From the first, our industry recognized that Japan could not instantaneously fulfill this commitment, but we have expected continued and major efforts to do so. In fact, NTT's procurement of U.S. products has risen from only \$15 million in 1981 to \$140 million in 1983, and then stagnated in 1984. This level is clearly less than adequate; equally important, purchases have not been infrastructure items, such as transmission equipment or switching systems, that would generate continued business. While this progress has been insufficient, particularly given Japan's growth in our market, we did feel the top leadership in NTT was sincerely trying to open Japan's market.

For the whole market, both NTT and non-NTT procurement, foreign access is and has been far less than we believe it should be.

For example, in 1984 imports accounted for a mere 1.8 per cent of Japan's apparent domestic consumption in telecommunications equipment. This is about half the same ratio for France, a country that has not committed to open its national procurement monopoly to foreign competition.

Another indication of the frustration felt by U.S. telecommunications exporters is apparent in the results of a survey conducted by the U.S. International Trade Commission. The ITC noted that U.S. producers reported 53 barriers in the Japan market, compared to only 16 for France and 15 for West Germany.

Obviously, such figures are somewhat subjective, since we have no way of knowing which complaints are valid. Nonetheless, the fact that there were more than three times as many complaints about Japan as countries that have not committed to an open market is significant.

Japanese Market Restructuring

As this Committee knows, Japan has been in the process of restructuring its market. Three laws passed the Diet in December of 1984, which provided for the privatization of NTT and the future structure of the Japanese market. By itself, this restructuring is not necessarily related to market access or to Japanese commitments to an open market. Rather, this restructuring is something that the Japanese are doing for their own reasons, and principally to increase market dynamism so as to be pre-eminent in the emerging "information society."

However, if conducted correctly, restructuring presents an opportunity for Japan to fulfill its five-year old commitment to an open market. If done incorrectly, it also presents an opportunity for those in Japan who advocate a closed market to undermine the limited progress that has been made over the last five years.

Although Japan's recently passed laws are scheduled to go into effect on April 1, just 12 days from now, the U.S. industry does not know how the laws will be implemented. In spite of the fact that American negotiators as early as January 1984 have repeatedly asked for copies of proposed administrative procedures, we have only recently, starting on February 28, 1985, been given Japanese language drafts. To date, we have only seen a small portion of the regulations.

We suspect that the Japanese industry has a better idea of the evolving picture than do we. For example, last March, a number of the major Japanese producers and large banks, together with NTT, formed a Telecommunications Terminal Equipment Inspection Institute, with a capitalization of \$600,000, organized expressly for the purpose of certifying telecommunications interconnect equipment as complying with Japanese standards. Preparations for this Institute were made back in 1983 by MPT officials. In October 1984, under Ministry of Posts and Telecommunications approval, this institute began processing some equipment, and some U.S. producers have already complained to us about problems.

in obtaining such certification to sell in the Japan market.

This lack of "transparency" has been a source of great frustration to us, and we suspect it has exacerbated overall trade relations. We are not requesting that the Japanese system be transparent in the identical way ours is, where regulations are generally published in the Federal Register with sufficient opportunity for all interested parties to comment, and where Congressional hearings are open to testimony from foreign representatives as well as our domestic interests. However, our markets are inter-related. Japan's exports to the U.S. are 40 percent the size of their domestic consumption in telecommunications.

We believe it is in both of our interests that we in turn should be informed of what is being considered in Japan, and should have an opportunity to provide meaningful input. This is not a process of telling Japan what to do, any more than they tell us what to do. Rather, what we need is a process for friends to talk in a real and meaningful way.

Access Issues

In regard to substantive concerns, Japanese producers have absolutely no difficulty in having their products certified for the U.S. market. Clearly, it is not acceptable to have a Japanese producer association operating as any type of interface for American access to the Japanese market.

The test for access to the U.S. telecommunications market is "harm to the network". This test works well. We believe that the Japanese should also adopt this simple, standard test. Certainly, the standard should not contain extraneous criteria, and the approval process should be simple, clear and provide little room for a Japanese bureaucrat to distort access. Indeed, there is no apparent reason why Japan should not simply type approve American terminal equipment based on the acceptance of U.S. data. In addition, there should be one approval system for all types of equipment, under the direct control of the Ministry.

In the area of value added services, the U.S. is extremely competitive. In services such as airline ticket reservations, credit cards, and a host of other services where computers and telecommunications technology have blended to offer innovative services undreamed of just a decade ago, the U.S. leads the world. We are concerned that the proposed regulations may include prior approval registration requirements for such services -- so called Type II services -- that may be excessive. Certainly, it is easy to see how the need for registration and approval could open up wide potential for distortion. And because these services rely on hardware and software, it is also easy to see how procedures that allowed for significant bureaucratic flexibility could be used to distort trade in products as well. In addition, we are very concerned that proceeds from the sale of NTT stock could be utilized to subsidize telecommunications research and product development.

Overall, a significant step toward transparency could be achieved with foreign participation in the Japanese telecommunications Advisory Council. Other constructive steps in this regard would include a minimum of 60 days to comment on new standards and the establishment of an appeal process external to MPT.

To deal with these problems, U.S. negotiators had to be stationed in Japan full time for about a month, in addition to the need for repeated visits by the U.S. team headed by Under Secretary Olmer and Ambassador Smith. The U.S. representatives did a truly impressive job, and they literally worked around the clock. However, we believe this process would not have been necessary, if Japan had clearly begun with the articulated objective of fully opening its market and the process of legislation and rule making had been transparent.

We remain hopeful that in the regulations that emerge on April 1, these potential concerns, and others that have been voiced by U.S. industry, prove unwarranted. We appreciate Prime Minister Nakasone's reaffirmation of his country's commitment for an open telecommunications market during his visit to the U.S. earlier this year. Certainly, U.S. concerns have been strongly articulated in the working group on telecommunications that the Prime Minister and President Reagan established, subsequent to this visit.

We recognize that the Ministry of Posts and Telecommunications faces an incredibly difficult job in implementing the regulations

for the restructured Japanese market. And we are hopeful that the Ministry will be able to accomplish this feat in a way that fulfills the Prime Minister's commitments. Nonetheless, many questions regarding market access such as those outlined above are still unanswered, even though we are on the eve of the effective date of the new law and regulations. For the foreseeable future, both sides should meet regularly and periodically to ensure that new barriers or distortions do not arise to undermine sales opportunities.

Market Access Objective

To the extent that the regulations to become effective on April 1 do not fully address U.S. concerns, it is imperative that the U.S. side take positive steps to demonstrate to the Japanese our own serious commitment to preserving the strength of our own telecommunications industry. The best measure of market access during the months ahead will be the extent to which American companies are actually able to compete and sell in the Japanese market place. The logic of this particular approach lies in the competitive posture of American telecommunications suppliers in comparison with their Japanese counterparts. That is to say, if American telecommunications suppliers are able in the immediate term to get substantially equivalent competitive opportunities in Japan, we fully believe they will increase the volume of sales that they are making above and beyond their current levels. Since Japanese products are no more competitive in the telecommunications area as a whole than are U.S. products, it is

reasonable to assume that our import penetration level would be the same as theirs if their market were fully open. In such an event, we believe Japanese imports of American equipment would have been \$410 million higher in 1984 than they actually were. Moreover, with the anticipated explosion in telecommunications technology this market could triple by the end of the decade.

U.S. firms need to be able to manufacture their products in Madison, Wisconsin or Allen, Texas and sell them in Japan, if the products are price and quality competitive. This means formal barriers have to be removed, and informal barriers have to be minimized.

Perhaps just as importantly, over the long term, Japan's system that economically and culturally favors domestic production, and is oriented to export growth, needs to adapt to the realities of the 1980's. Robert Samuelson recently had an excellent column in Newsweek in which he noted that Japan's export fixation and bias against imports is fueling protectionism around the world.

More importantly, I do not believe such a bias against imports is in the interest of the Japanese people themselves. Japan has one of the most productive and well-educated work forces in the world. At present, they are working at a furious pace to sell to the U.S. at an exchange rate of 260 yen to the dollar. The U.S. will never be able to pay off the growing foreign debt arising from our trade deficit at that exchange rate. This means that the Japanese will be paid back at perhaps 200 yen to the dollar,

or at currency worth some 25 per cent less.

In short, the U.S.-Japan trade deficit injures both U.S. industry, and the Japanese consumer. Our countries have to begin serious efforts to eliminate this distortion.

U.S. Action Needed

As I noted in the beginning of my testimony, the trade problem is not just a lack of fair market access. We in the U.S. have to own up to a share of the blame. The over-valued dollar traces back to the federal budget deficit. And the Administration itself can simplify the export control process without weakening national security.

The Japanese complaint that U.S. industry itself does not give enough emphasis to exporting to Japan also has had some validity in the past. However, it is important to emphasize that U.S. firms seek markets around the world. If a market is not open or accessible, it is a natural business decision for the firm to concentrate on other markets where its return will be higher.

Nonetheless, the American Electronics Association takes this particular point seriously, and is undertaking to help our companies sell in Japan in several ways. First, our Association opened an office in Tokyo in June of 1984, through which AEA provides on-site resources to companies trying to sell their products. This is the first and only office in Tokyo of any U.S.

manufacturing industry opened on an industry-wide basis.

In the area of telecommunications, AEA is working with both industry experts and government representatives, particularly at the Department of Commerce, U.S. and Foreign Commercial Service, in conjunction with the Tokyo office of FCS to conduct a series of seminars on new Japanese standards and product certification requirements. It is hoped that these efforts will result in a concerted effort by the American electronics industry to take advantage of access to foreign markets and increase exports thereby offsetting the deficit through increases on the export side.

Conclusion

To sum up the AEA approach, American suppliers have competitive products to sell in places like Japan, but only if they undertake to do so in a sophisticated and vigorous manner, and if the foreign markets are open. The time has come for other countries to realize it is in their own interest to provide equal access and buy foreign goods when they are competitive.

All of us have to realize that the trading system is being tested in a fundamental way. If we and other countries do not take these problems seriously now, the present trading system will crumble, and all of us will be the worse off.

Senator BENTSEN. Thank you very much, Mr. Bowen. I would now like to call on an old friend of mine, Mr. Winston Wilson, with U.S. Wheat Associates, who is representing wheat farmers. You may proceed.

STATEMENT OF WINSTON WILSON, PRESIDENT, U.S. WHEAT ASSOCIATES, INC., WASHINGTON, DC

Mr. WILSON. I'm president and chief executive officer of U.S. Wheat Associates, and I'm here today to testify on behalf of our organization and the wheat farmers in the 14 wheat-producing States that we represent, and Texas is one of those States.

We are a market development organization funded by checkoff funds by the farmers in the 14 States, and also we receive funding from the Foreign Agricultural Service of the United States Department of Agriculture. We do not normally become involved in domestic foreign policy issues or legislation in general, but from time to time we do appear before committees such as this to provide information on specific trade issues which we think are impacting U.S. wheat export trade and agriculture in general.

I congratulate you on holding these hearings. I think they are especially timely in view of the rather desperate situation that we find ourselves in in export markets and the current heavy emphasis that's being placed on these markets as the solution to our crisis in agriculture.

We maintain 13 regional oversea offices around the world and work in all of the major wheat markets. Currently we have programs in about 100 countries. In addition to daily communications with our oversea offices, I also travel to the major markets at least once a year and do maintain a fairly good picture of developments in these markets.

I'm not going to spend a lot of time telling you about the export situation. You are certainly very familiar with that. But to give you some idea, in terms of wheat exports in particular, we have seen our sales fall from a little over 48 million metric tons in 1981, almost \$8 billion worth, to sales this year of—I've got a 39-million-ton number here. I think USDA cut that again earlier this week, but that's less than \$6 billion.

In terms of world market share, we have fallen from 48 percent of world market share to now probably somewhere in the 34 to 35 percent range. There are a number of factors that we feel are responsible for this, and I would like to briefly touch on at least three of the major factors.

Of course, it's impossible to talk about exports without mentioning the impact of the strong dollar. You have held hearings on this and certainly I don't want to spend a lot of time on that today. The 35-percent appreciation of the dollar over the past 2½ years has clearly had an impact. At the same time it has impacted export industries such as ours, it's also impacted import-sensitive industries in this country as well.

Unfortunately, many of the steps that have been taken to protect import-sensitive industries have very adversely affected agricultural exports and possibilities for future exports as well. I think we need to look very carefully at any steps that are taken in the im-

mediate future to protect our domestic industries from the impact of the strong dollar without also looking at what impact these steps might have on export industries such as agriculture and several other industries which are very sensitive in this regard.

I am going to be talking about trade barriers or trading practices today that are a little different from what the previous two gentlemen have discussed. Our problems are not so much limits on market access, but trading practices by other producers, competing exporters, which in effect have shut us out of many markets during the past 3 years. I would have to rank the European Economic Community Subsidization Program very high on this list.

In the past year and a half, because of the amazing strength of the dollar, the subsidization has not been as high as that required in the past. Over the years the EC, of course, has adopted a very high domestic support level for their domestic agricultural producers. You mentioned sugar and some of the other examples earlier. The effect of this, of course, has been to increase domestic production much faster than domestic consumption has grown.

For example, in the case of wheat, since 1975 the production of the European Community has gone up by 50 percent while consumption has gone up by less than 10 percent. Consequently, there has been a major effort of the EEC to move this wheat into export markets. They have become a major exporter, and they have engineered this through heavy subsidization practices.

Certainly it's difficult to find a lot of fault with their philosophy in terms of domestic support. That is, in my view, their business. If they feel that concerned about food security and place that high a value on the social aspects of a well-financed domestic agriculture, more power to them. But when it becomes a major factor in world export markets, I think it's time that serious discussions occur.

Without going into a lot of detail as to how the Subsidization Program works, I think it sufficient to say that the Community determines what level of wheat they desire to export and they establish export restitutions accordingly. The most recent numbers that we've received—and I got these this morning—was in most areas the subsidy is running about \$13 a ton on wheat. They frequently adjust these to offset ocean shipping disadvantages which may exist for the Community, particularly when they are trying to get into South America or some countries where they have a built-in freight disadvantage.

Over the years, there's been considerable discussion between the United States and the European Community concerning their subsidization. There's been a number of GATT cases and there's been very little good results from our viewpoint, and I don't think that anything short of economic sanctions will force a change in the European Community's export practices.

I know in the export portion or title of the administration's farm bill there's reference made to further and higher level discussion with the Community on their export policies and some of their import policies. I frankly, first, don't think that more discussion without some action is going to get much results; and, second, solving all of the problems with the European Community is not going to solve all of our export problems in agriculture. I hope that we

don't bank too much on just solving the Community problems, because there are a lot of other problems out there.

I would like to address some of those at this point. In terms of trading practices of other competing exporters, I think it's necessary to mention the pricing practices of the wheat boards of Canada, Australia, and Argentina. These boards are the sole sellers of wheat for export from these countries. They work basically with a system of administered prices and, using U.S. prices as a benchmark, they regularly undercut our prices in order to increase their market share. This is especially true in markets which purchase through private treaty rather than public tenders.

Some recent examples of this, last week the Australian Wheat Board representatives were in Singapore. They agreed to cut their posted prices by as much as \$12 a ton in order to get the business. The statement was made to the wheat trade in Southeast Asia that the posted prices don't really mean that much. They'll cut them to any extent necessary.

Other similar activities that are regularly used by these government organizations include donating commodities in order to bring the effective price down, and more recently there have been several donations of things like grain silos and port facilities and various and sundry other things that the American grain trade, obviously, cannot do because they don't have a lock on the business. But it is a very important competitive factor that's hurting us significantly.

As I mentioned earlier, the U.S. share has gone down from almost 50 percent to well under 40 percent. During this same time period, the Canadians have increased their share from 17 to more than 22 percent, and Argentina, which was almost nonexistent in terms of export competition 5 years ago, now has more than 10 percent of the world trade.

Part of another trading practice which I think has had some impact in this area is the proliferation of long-term grain agreements with importing countries. Frequently, these include pricing mechanisms as well as guaranteed quantities to be supplied. The U.S. marketing system does not lend itself well to these types of agreements. Of course, we have had a Soviet agreement for many years, but it's not quite the same as the agreements that the Australians and the Canadians and now the Argentines are regularly negotiating.

There have been deep philosophical problems with this within the U.S. Government as well as the U.S. grain trade, but we see that we are becoming more and more a residual supplier in a world market with an ever-decreasing residual. We currently estimate that almost 40 percent of the world wheat trade is covered by term agreements.

Now, in addition to the problems and concerns that we have with competing exporters' trade practices, there are also some trade barriers in the same vein that the previous speakers have mentioned. However, I think in total that they are probably not as severe a problem to us in wheat as some of the other agricultural commodities; certainly beef and citrus comes to mind and the years-long battle that has been waged there. And I think the majority of in-

stances have not particularly placed U.S. producers at a disadvantage vis-a-vis other exporting countries.

But two that we are concerned about that were mentioned briefly, is the requirement—and this concerns Japan—that all of the wheat imported into Japan must be sold by a local national company. This has been a longstanding practice in Japan. It appears to be developing as well in Korea. And what this does, it limits competitiveness and it does not allow American companies free direct access to these markets.

A second concern that we have is that in many countries, purchases are made through private negotiations and not through public tenders. We realize that it's going to be very difficult for the U.S. Government to bring about some changes in this, but they have been successful in a few instances in the past. But it does raise serious questions periodically as to what the actual terms of trade were and what incentives might have been used to close the deal. It also makes it very difficult to keep up with what competitors are doing in terms of price cutting, donations, et cetera.

The reason that this is a matter of concern to us, and becomes very important, is over the past 2 or 3 years as we have looked for additional incentive-type programs, whether blended credit programs or whatever else to help our competitive situation, we have constantly run afoul of the State Department and other agencies within the U.S. Government which are being very careful to protect the interests of the Canadians and Australians. Even the Argentines are doing so on the basis that we cannot prove that they are cutting prices regularly. So therefore we would be much more comfortable if there's a bit more visibility as to trading practices around the world.

In terms of other U.S. Government activities, obviously things like the 1980 Soviet grain embargo have had a serious impact and will continue to for many years to come. Other things that have impacted us more recently, the one that comes to mind most readily, of course, is the longstanding textile dispute with the People's Republic of China. We saw a more than 50 percent loss in our sales share in that market in a very short period, primarily, in our view, due to the textile problem.

There has been legislation introduced just this week in both the House and Senate which would tighten worldwide textile quotas, and this would clearly impact not only the PRC, but other Asian markets as well. According to our calculations, these quotas that are being proposed would impact about 35 percent of U.S. wheat exports.

Other U.S. Government activities which we have been concerned about is the periodic use of Credit Programs and other CCC Programs to accomplish diplomatic goals. In many cases the State Department has decided to play hardball with a particular country in order to accomplish some other mission, and in the meantime that country has bought their wheat or other agricultural products elsewhere. I think there needs to be a better understanding that decisions in terms of food supplies have to be made on a timely basis.

I would mention one other item of concern, in terms of U.S. Government action, is the proposed surcharge or origination fee on all U.S. Government-initiated Credit Programs. Credit, frankly, has

been our primary competitive edge that we have had in the past 2 or 3 years since the dollar started to escalate. If the proposal is adopted, in our view it would totally destroy the Credit Programs as an export incentive.

The numbers that are being proposed would amount to about 20 cents a bushel on wheat, or \$183,500 per 25,000-ton cargo of wheat. This would effectively make us noncompetitive. In our view, adopting this proposal would be a total disaster in terms of expanding or even maintaining current export levels. Certainly the Credit Programs have been a valuable tool for us.

I think I would summarize my remarks by saying that obviously the strong dollar is a major impact on our exports, and there are a number of other problems around the world that are somewhat dollar related, but in many cases the trading practices of our competitors are having significant impacts on current trade and eventual trade in the future. We are probably not as concerned about incountry import barriers. There are barriers to our exports, but they are primarily the trade practices of our competitors.

Thank you very much. I appreciate the opportunity to come this morning.

[The prepared statement of Mr. Wilson follows:]

PREPARED STATEMENT OF WINSTON WILSON

Mr. Chairman and members of the Committee. My name is Winston Wilson, and I am President and chief executive officer of U.S. Wheat Associates. I am here today to testify on behalf of U.S. Wheat Associates and the wheat farmers in the 14 wheat-producing states which we represent.

U.S. Wheat Associates is a market development organization funded by check-off funds in 14 states and the Foreign Agricultural Service, U.S. Department of Agriculture. We are an export market development organization and do not become involved in domestic farm policy issues or legislation in general. However, we do, from time-to-time, appear before Congressional committees such as yours in order to provide information on specific trade issues which we believe are having serious impact upon U.S. wheat export trade.

I would like to begin by congratulating the Committee on holding these hearings. I believe that they are particularly timely

in view of the rather desperate situation we find ourselves in with regard to export markets and the heavy emphasis being placed on export markets as a major avenue of relief to the current crisis in U.S. agriculture.

As I mentioned earlier, we are the export development organization representing U.S. wheat farmers overseas. In order to accomplish this goal, we maintain 13 regional overseas offices and are in daily contact with major wheat markets around the world. In addition to daily communications with our offices overseas, I also travel to most major wheat markets at least once a year and consequently maintain a fairly good picture of developments in these markets as they occur.

As I am sure you are aware, the export situation for wheat, as well as other U.S. agricultural commodities, has made an appreciable change for the worse since the high-water mark of 1981. In terms of wheat exports, we have seen our export sales fall from 48.2 million metric tons in 1981 valued at \$ 7,919 billion, to estimated sales during the 1984-85 crop year of 39.4 million tons at \$ 5,949 billion. This represents a decline in market share from 48 percent to approximately 35 percent of world trade. In my view, there are a number of factors responsible for this decline in export volume and market share, all of which are within the scope of interest of this Committee, and I would like to take this opportunity to address what I consider to be three of the major factors in our current difficult situation.

Our most severe, immediate problem today is the impact of the overvalued dollar upon our ability to be competitive in world markets. The dollar has appreciated by more than 35 percent against most of the major currencies of the world, and the impact of this appreciation has been to make our products more expensive to our foreign customers as well as provide our competitors with more room for price cutting in world markets. Clearly the impact of the unexpected and unusual strength of the dollar has extended well beyond U.S. wheat export sales to include all agricultural and non-agricultural exports as well as import-sensitive industries within the United States. Unfortunately, many of the steps taken to protect import-sensitive industries within this country have adversely impacted agricultural exports and wheat exports in particular. I will not elaborate further on the impact of the overvalued dollar since the members of this Committee are certainly well aware of the effects of this phenomenon. However, I would take this opportunity to express a very great concern with some proposals which are currently being discussed in Congress with regard to protection of import-sensitive industries with little or no regard for industries such as agriculture which are heavily dependent upon exports and are just as severely impacted by the effects of the strong dollar.

A second major factor in the current decline of wheat exports has been the trading practices of competing producers. In terms of long-term concerns that we have in regard to wheat exports, I would have to rank the European Economic Community's subsidization programs very high on the list. Recently, the European Community's

reliance on subsidy programs has been lessened considerably by the strong dollar, but in any event, EEC export policies have been a problem for many years and will continue to be a major concern, especially if the U.S. dollar were to weaken considerably. Since EEC domestic support levels are normally substantially above world market prices, it has been necessary for the Community to create artificial economic incentives to export when supply overruns domestic demand, as well as to erect economic barriers to imports in order to protect domestic prices. Clearly the governments of the European Economic Community have made the decision that the protection of domestic agriculture and the social values represented there are a high priority, and we certainly have no quarrel with that. However, the result of extremely high domestic support levels has been an almost 50 percent increase in domestic production since 1975, while domestic consumption has increased by less than 10 percent. Consequently, the EEC has more than doubled wheat exports during that period through the use of substantial export subsidies. Without going into great detail as to the method of establishing subsidization rates, it is sufficient to say that the European Community determines what levels of wheat are to be exported and establishes export restitutions accordingly. These refunds are also frequently adjusted to offset ocean shipping rate disadvantages which may exist for the Community.

Despite the fact that there has been considerable discussion between the U.S. and the EC over the past few years concerning subsidization, there has been very little indication that any means short of economic necessity will bring about a meaningful change in

the program. Unfortunately the current strong dollar situation has given the Community a reprieve on what could have been a very substantial budget problem during the most recent two years. The impact of the decline of most European currencies against the dollar has been that the European Community has been able to export with fairly low restitution levels. Until the Community takes some action to limit the growth in domestic production, it is highly unlikely that mere rhetoric from the U.S. will be very successful in bringing about significant changes in E.C. export policy.

In terms of the trading practices of other competing exporters, it is necessary to briefly mention the pricing practices of the Wheat Boards of Canada, Australia and Argentina. Since these Boards are the sole sellers of wheat for export from these countries, they are able to work on a system of administered prices, and using U.S. prices as a benchmark, quickly undercut those prices in order to increase their market share. This is especially true in markets which purchase through private treaty rather than public tenders. Aided by the strengthening dollar against domestic currencies, Canada and Argentina have been most successful in increasing their market shares. Since 1981, the U.S. share of world wheat trade has gone from 48 percent to well under 40 percent, while Canada has gone from 17.5 to 22 percent, and Argentina has gone from slightly over 4 percent to more than 10 percent of world wheat trade. One major factor which has allowed our competitors to increase their market share has been a proliferation of long-term agreements with importing countries. These agreements frequently include pricing mechanisms and guaranteed quantities to be supplied. Since the U.S.

marketing system does not lend itself well to the negotiation of such agreements and there have been deep philosophical objections to such agreements within the U.S. government as well as the grain industry, we are increasingly becoming a residual supplier in a world market with an ever-decreasing residual. We estimate that 35-40 percent of world wheat trade is currently covered by long-term agreements.

I have briefly outlined some of the practices of competing exporters which have given us serious concern during this period of declining market share and producer prices. There are obviously also concerns from the standpoint of trade barriers in importing countries. However, this has not been as severe a problem to us as that experienced by other U.S. agricultural commodities in most cases, and in the majority of instances has not placed U.S. producers at a disadvantage vis-a-vis competing exporters. I might mention two specific items in this regard. The first is the requirement that all wheat imported into some countries must be sold by a local trading company. This has been a long-standing practice in Japan and appears to be developing in Korea as well. We feel that in many cases this requirement limits competitiveness and does not allow American grain exports free access to those markets. A second concern is that in many grain-importing countries purchases are made through private negotiations and not through public tenders. We realize that it is highly unlikely that the United States can bring about significant changes in these practices, but it does periodically raise serious questions as to what the actual terms of

trade were and what incentives might have been used to close the deal.

As a final note, I would like to very briefly touch on some specific actions by the U.S. Government in recent years which have severely impacted our access to a number of markets. Obviously the series of grain embargoes during the 1970's concluding with the 1980 Soviet embargo have now had a serious impact, not only on our access to markets but also upon production practices of competing nations. Aside from the embargoes, in recent years there have been a series of trade disputes between the U.S. and wheat importing countries which have severely affected our exports to those countries. The most notable example of this has been the textile dispute with the People's Republic of China. In the interest of protecting the domestic textile industry, actions have been taken which have severely impacted our wheat sales to the PRC and probably will affect our sales there for many years to come. It is my understanding that there is currently legislation in both the House and Senate which would extremely tighten worldwide quotas. If this legislation does become law, it will clearly impact not only the PRC market but other Asian markets as well. We feel very strongly that there should be some consideration of the retaliatory effect of these types of actions. Other areas of government activity which have been detrimental to our marketing efforts include periodic use of CCC credit programs to accomplish diplomatic objectives. In many instances, this type of activity has resulted in credit being withheld for a considerable length of time during which the importing country purchased elsewhere. The State Department and

other Government agencies appear to have little regard for the fact that sales of food products must be concluded on a very timely basis.

My final comment is directed toward the proposed surcharge or origination fee on all U.S. Government-initiated credit programs. It is our understanding that the provisions of the proposal from the Office of Management and Budget would result in additional costs of approximately 20 cents per bushel or roughly \$ 183,500 per 25,000 ton cargo of wheat. This level of additional credit cost would more than offset any competitive advantage that our credit programs have been providing us, and in my opinion, over the past two years our credit programs have been the primary factor which has kept us in many foreign wheat markets. In our view, the adoption of this proposal would be a total disaster in terms of expanding or even maintaining current export levels. In the same vein, a recent court decision regarding the applicability of cargo preference rules to the blended credit program, as well as a statement indicating that this should also apply to the guarantee program GSM-102, has for all practical purposes killed the entire CCC export credit program. In our opinion, it is imperative that legislative action be taken immediately to correct this situation.

I appreciate your attention and the opportunity afforded me to appear before you today. Thank you very much.

Senator BENTSEN. Thank you very much, Mr. Wilson. At this point I'll put in the record a written opening statement of Senator Mattingly who is not attending this hearing.

[The written opening statement follows:]

WRITTEN OPENING STATEMENT OF SENATOR MATTINGLY

I WILL BE BRIEF. I AM SURE BY NOW THAT MOST OF US ARE WELL AWARE THAT LAST YEAR THE UNITED STATES RAN UP A TRADE DEFICIT IN EXCESS OF \$123 BILLION. MANY OF US SEARCH FOR WHAT WE BELIEVE TO BE A POSITIVE APPROACH TO THE TRADE DEFICIT; WE ENCOURAGE THE DEVELOPMENT AND MODERNIZATION OF U.S. TECHNOLOGY AND INDUSTRY AND THEN SEEK WAYS TO TRANSFORM THAT DEVELOPMENT AND MODERNIZATION INTO GOODS AND SERVICES THAT CAN BE SUCCESSFULLY MARKETED BOTH HERE AND ABROAD. HOWEVER, AS WE SEEK TO PROMOTE THE EXPORT OF THESE GOODS AND SERVICES IT HAS BECOME EVIDENT THAT GOVERNMENT INTERVENTION IN INTERNATIONAL TRADE FLOWS IS INCREASING. THIS INTERVENTION IS OFTEN TO THE DETRIMENT OF U.S. EXPORTS. ALMOST EVERYWHERE WE TURN WE FIND RESTRICTIONS AGAINST U.S. INVESTMENTS, GOODS, SERVICES, AND EVEN MOVEMENT OF PROFESSIONALS. BARRIERS TO

U.S. EXPORTS MAY TAKE THE FORM OF EITHER INFORMAL PRACTICES OR FORMAL TARIFFS AND QUOTAS AND THEY ARE IMPOSED BY THE MAJOR TRADING NATIONS AS WELL AS THE DEVELOPING NATIONS.

DESPITE ALMOST CONTINUOUS NEGOTIATIONS WITH OUR TRADING PARTNERS AND THE ROUTINE ISSUANCE OF THREATS TO ACT, THE SITUATION CONTINUES TO WORSEN. WHILE THE LIST OF PRODUCTS AND SERVICES WOULD LIKELY REACH FROM THIS ROOM TO THE WHITE HOUSE, I WANT TO SPECIFICALLY MENTION SEVERAL AREAS THAT ARE OF PARTICULAR IMPORTANCE TO MY STATE OF GEORGIA. WE ARE IN THE MIDST OF ATTEMPTING TO WIN GREATER MARKET ACCESS IN JAPAN IN SEVERAL KEY SECTORS, AMONG WHICH IS WOOD PRODUCTS. FORESTRY AND RELATED ECONOMIC ACTIVITIES IN GEORGIA COMPRISE A \$8.6 BILLION INDUSTRY EMPLOYING 80,000 PEOPLE. GEORGIA LEADS THE NATION IN PULP AND PAPER PRODUCTION AS WELL AS A HEALTHY PORTION OF THIS COUNTRY'S LUMBER, PLYWOOD, VENEER, AND WOOD PRODUCTS. WHILE JAPAN DOES NOT IMPOSE QUANTITATIVE RESTRICTIONS ON WOOD PRODUCTS IMPORTS, JAPANESE TARIFFS RANGE FROM 12-20%. JAPAN IMPORTS A GOOD DEAL OF

LOGS, BUT ALMOST NOTHING ELSE FROM THIS CATEGORY. THE JAPANESE PLYWOOD INDUSTRY IS AILING--IS IT LITTLE WONDER THEN THAT THE JAPANESE KEEP OUT U.S. PLYWOOD, VENEER, AND PARTICLE BOARD? THUS FAR THE JAPANESE HAVE POINT BLANK REFUSED TO EVEN CONSIDER REMOVING TARIFFS ON WOOD AND WOOD PRODUCTS IMPORTS AND NEGOTIATIONS ARE UNDERSTANDABLY AT A STAND STILL.

NOW I DON'T WANT TO BE VIEWED AS PICKING ON JAPAN. IN OCTOBER THE BRAZILIAN CONGRESS PASSED LEGISLATION THAT CODIFIES POLICIES DESIGNED TO ACHIEVE THE DEVELOPMENT OF A BRAZILIAN INFORMATICS INDUSTRY. AMONG OTHER RESTRICTIONS, FOREIGN COMPANIES THAT ALREADY MARKET EQUIPMENT MAY CONTINUE TO DO SO, BUT NEW FOREIGN INVESTMENT IS LIMITED TO EXPORT MARKETS. EVEN JOINT VENTURES ARE PROHIBITED BY THE LEGISLATION. GEORGIA HAS DEVELOPED ITS OWN MINI SILICON VALLEY JUST OUTSIDE OF ATLANTA. WHILE MAINTAINING ITS AGRIBUSINESS AND TRADITIONAL MANUFACTURING BASE, GEORGIA HAS ATTEMPTED TO BROADEN ITS HORIZONS TO INCLUDE A STRONG HIGH TECHNOLOGY SECTOR AND I AM PLEASED WITH OUR SUCCESS

IN DEVELOPING SUCH AN INDUSTRY. WE HAVE FURTHERMORE, DEVELOPED OUR HIGH TECHNOLOGY SECTOR WITHOUT CLOSING OUR MARKET AS BRAZIL HAS DONE. AS OTHER NATIONS FOLLOW BRAZIL'S LEAD FLEDGLING HIGH TECH INDUSTRIES SUCH AS GEORGIA'S WILL FIND OVERSEAS MARKETS CLOSED TO THEM WITH OPPORTUNITIES FOR COOPERATION ON VITAL RESEARCH AND DEVELOPMENT SURE TO DISAPPEAR.

LET ME CLOSE BY SAYING THAT I HAVE ONLY MENTIONED TWO CASES IN WHICH TRADE BARRIERS EFFECT VIABLE GEORGIA INDUSTRIES. I MIGHT ADD THAT MY STATE'S AGRICULTURAL PRODUCERS CONTINUE TO FACE A VARIETY OF BARRIERS TO THEIR EXPORTS IN MARKETS ALL OVER THE WORLD. THIS CRIPPLING SITUATION IS NOT GOING TO CHANGE UNTIL THE UNITED STATES GETS TOUGH WITH ITS TRADING PARTNERS. I DON'T MEAN FINDING NEW WAYS TO NEGOTIATE OR THREATEN--I MEAN BY USING EXISTING LAWS INTENDED TO ADDRESS THE PROBLEM. LET'S USE SECTION 301 OF THE TRADE ACT WHICH THE U.S. TRADE REPRESENTATIVE'S OFFICE CAN NOW SELF-INITIATE AND, ABOVE ALL, OUR TRADE OFFICIALS MUST USE THE RECIPROCITY CLAUSE PROVIDED FOR IN THE 1984 OMNIBUS TRADE ACT PASSED BY THE CONGRESS LAST FALL AND FOR WHICH I WHOLEHEARTEDLY VOTED. THE ABOVE ACTION MUST BE UNDERTAKEN WITHIN THE CONTEXT OF TRYING TO DEVELOP A GLOBAL CONSENSUS THAT THESE OBSTACLES TO INTERNATIONAL TRADE MUST BE DONE AWAY WITH. THE UNITED STATES HAS THE ECONOMIC STRENGTH TO DEVELOP SUCH A CONSENSUS--LET'S DO IT NOW!

Senator BENTSEN. Mr. Bowen, let me get to the point of the meeting between President Reagan and Mr. Nakasone in January. I think that the President put his personal prestige on the line in saying Japanese trade barriers would come down. And so did, I think, Prime Minister Nakasone. Talks are underway. But the case is very clear cut. We deregulated the U.S. telecommunications market by forcing AT&T into divestiture. Japanese firms rushed in and their U.S. sales nearly tripled, to exceed \$1 billion in the 2 years from 1982 to 1984. And yet from what you tell me, Japanese imports from members of your association rose a scant \$2 million in 1984, to \$194 million.

We are getting mixed signals on the progress of those negotiations with the Japanese. One of the things they do is they have the right to self-certification that their equipment will not harm our network. Have you seen the latest proposed Japanese regulations? Will American firms have the same self-certification rights of access in Japan as a result of these new regulations?

Mr. BOWEN. Realizing that most of what you refer to as the latest information on the certification process I have not seen, we understand pieces of it, that it will have various levels of certification, various restrictive elements, control elements in it. To be explicit, I haven't seen it, but I do understand that it is fairly restrictive.

Senator BENTSEN. Will Japanese firms have the right to veto United States products coming into their country being sold by United States competitors?

Mr. BOWEN. It appears through the associations that are set up for the certification program, currently you have membership in those associations by the Japanese telecommunications companies themselves. So indirectly, through their representation on the certifying agent, they will have direct control.

Senator BENTSEN. Do you think there's kind of an old-boy network in Japan?

Mr. BOWEN. Senator Bentsen, there's no question about it. Let me make a statement.

You have, obviously, to always come at a situation like this from the national precedents that have been set and how the Japanese culture has evolved. I very well respect their technical ability and their focus. Their focus, as opposed to the U.S. focus. The United States gets out there in an entrepreneurial mode. We go at technology in a very broad front. The Japanese come at a marketplace on a national basis. They pick out that piece that's easiest to enter and then they focus on that and then they spread from there.

There absolutely are two so-called old-boy networks. One is a cross fertilization of people leaving major Government positions and moving out into the industry after their early retirement years. Another one is a more informal type which is kind of the informal industry spokesman that represents their industry and does some self-policing of their industry in accord with the national aims.

So, yes, there are two types of old-boy networks.

Senator BENTSEN. One of the things that worries me is a lot of people say that, well, when we get rid of this so-called imbalance in our dollar relative to the other currencies of the world, these trade

imbalances self-correct. I really don't believe that. I think that there's no question but what the bloated dollar is having a major impact on our competitiveness. Even if miraculously it declines, there are some structural imbalances between Japan and the United States that work to our disadvantage.

For example, the Japanese come in and establish a large market share with strong ties to their retailers; Japanese firms get their marginal costs down by the great volume they develop. They are very difficult thereafter to dislodge. One of you was testifying that even in a time of not very high demand they'd go ahead and add capacity, and they would dump it on the world market hoping that finally the market would recover and they'd be able to sell at a higher price.

The other structural practice is low balling entry prices. The Japanese will come in, like on the television market, the low side, on the low-price items. And once they develop their distribution they began to move up into the more luxury items, more of the high-price items, and finally they just take over the market. I see this type of market seizure long-term taking place there in many U.S. products.

If we don't make substantial progress in these negotiations, would you support efforts in this country to narrow the access of their telecommunications equipment into our market?

Mr. BOWEN. I believe that it is absolutely essential that we send signals, not only to the Japanese but the rest of the world, particularly in the telecommunications area, that all we want is fair access to their market. I guess the best way to do it, if there is only a continuing verbal commitment, and not in actuality a commitment to allow goods in through very restrictive processes, that the best way to send that message is some type of: "We are able to ship into this market on an open basis, therefore you'll be able to ship into our market."

There's no doubt about it, the statement has been made, not just by the Japanese but other countries, that the United States has given all these countries an open hunting license—quote—from some of these people. And we have no such open hunting license. So that's the best way to do it: Give us an open market, we give you an open market.

Senator BENTSEN. You know, I have been a free trader all my life and this goes against the grain. But I don't see what else we are going to be able to do to get those markets open but to take, I hope only on a temporary basis, some kind of restriction to get the Japanese markets to open.

Maybe we have to go through some kind of narrow tunnel to get back to something that more resembles a free market, because they don't seem to respond to any other kind of entreaties on our part to try to accomplish that. You look at these newly industrialized countries like Taiwan and South Korea. They are not free traders. Nor are the Europeans. They are, in effect, state traders.

I was listening to Mr. Wilson talking about the wheat trade boards that control prices. They look at the world prices and they cut their own prices to establish whatever price is necessary to increase that market share. I don't like that kind of approach. Yet, we may have to think of doing some of those kinds of things, it

looks like, in order to try to protect our position in these world markets.

Mr. BOWEN. Let me just make one comment on that, Senator Bentsen. I think it revolves back that the United States does not take strategic views of their penetration in the world markets. We tend to be more tactical and almost every other country, especially Japan, takes a strategic view. Part of that involves help in capitalizing companies, yielding them a very low cost of capital. The government gives the favored firms 10 to 15 years to pay that loan back. The firms focus on gaining an edge—whether it's a labor base or a technological edge—and then, as you pointed out, they expand that very quickly once they get entrenched.

We have, I think, a bias in this country which says that: "Oh, the Japanese are not good at this or not good at that." For instance we have a bias that says they are not good at computer software. That's wrong to assume that. They have just not attacked the software portion of the market yet.

Senator BENTSEN. Well, public attention has been focused pretty well on the Japanese trade barriers and the EC export subsidies. Those practices are very widespread. But the National Association of Manufacturers has identified 36 other nations which practice protectionism or which illegally subsidize exports. They said that the U.S. Government has yet to develop an adequate response to these foreign industrial policies.

That comports with what you said. It seems to me what we are seeing is an ad hoc trade response, that we have not had an overall strategy. We have not centralized the authority and the administration of trade policy in this country. The National Association of Manufacturers' criticism of U.S. trade policy is based on our Government's unsuccessful efforts to reduce these kinds of trade distortions.

I would like to ask any one of you, based on your own experience with our efforts in trying to reduce trade barriers, do you think the NAM's criticisms are valid, that we've substantially failed to reduce trade distortions? Anyone.

Mr. MYRICK. If I may address that one, I would say the answer to the question you put is—has the United States been successful in reducing trade distortions—the answer to that is "No." Certainly in regard to the Japanese, which is the main thrust of our concern, speaking from the semiconductor side, the answer is unequivocally "No."

But that is not because the United States has not tried. I want to emphasize, at least in regard to the semiconductor area which I am familiar with, that the Government has—and I'm speaking of the United States Trade Representative, Commerce Department, and other supporting agencies—has made a valiant and genuine effort. The Japanese have just not responded. The results have not been produced, even though the effort has been genuine.

Senator BENTSEN. One of the big hurdles facing U.S. firms is the low cost of Japanese capital. Moreover, I have noticed among the Japanese a tendency to reduce consumer consumption. They work at it. The interest rate they charge on consumer loans is incredibly high, and yet the long-term loans and the interest rates that they give to business are quite low in comparison to our own.

For a third difference, Japanese debt-equity ratios are about 3:1, where ours are 1:3. They just reverse that ratio and rely heavily on relatively cheap debt to give them a tremendous capital cost advantage. In effect, they have the government trying to assist in targeting financial institutions.

Mr. Wilson, I would like to address this one to you. We have talked about wheat and the fact that the EC heavily subsidizes it. We have had a lot of stories about that. But we've another one on the Japanese side insofar as the grain-buying system.

Do U.S. farmers really have open access to the Japanese market on grain? I would like to compare, for example, the price received by U.S. wheat farmers selling to Japan, with the prices charged by the Japanese merchants when it's resold in Japan. Can you give me an example of that?

Mr. WILSON. Well, most grain purchases by Japan go through the food agency, which is a government agency. They buy from the Japanese company at more or less the world market price, whatever the grain actually cost them. This is, in turn, then resold to the flour miller or wheat processor or whatever, at a rate considerably higher than the purchase price. In many cases its double that.

This is done, I think, for two reasons. One, I think the food agency was formed originally to organize food imports to Japan, because they are certainly one of the most deficient countries in the world in terms of food production. And it has an interest in doing this in an orderly fashion and the fact that in almost all countries of the world some government agency is doing the buying. There are very few exceptions to that, another instance where free trade doesn't really exist except in our hearts and minds in this country.

And this extra profit, if you will, that the food agency makes, some of it is used to support domestic agriculture, particularly in terms of retiring rice acreage and this sort of thing, and for other food-related activities in the country. We have seen several times in the past that this resale price has been increased while the world grain price has in fact gone down. So, in many instances it's a function of the budgetary needs of the Japanese Government and really has no relation whatsoever to supply and demand.

Earlier you mentioned the fact that you have always been a free trader. I think most Americans are, basically. But unfortunately I tend to believe that we might be the only country in the world that really honestly feels that way and tries to be a free trader. When I think about totally open markets, not just for agriculture but for other goods as well, it becomes very difficult to come up with anything but the United States and maybe Hong Kong and Singapore. The rest of the world has got some barrier there.

Senator BENTSEN. And we are developing more ourselves. There has been more protectionist action taken in the last 4 years than I can ever recall in this country. The problem is, it seems to be ad hoc. It seems to be slopped on in response to the latest crisis rather than as a component of an overall strategy, which you gentlemen were talking about earlier.

Let me ask you this: Do our wheat farmers, for example, have equal access to Japan? Are there cases that you know of where the Japanese Government wheat agency has gone around our wheat,

even though ours might be the lowest priced, and bought someone else's?

Mr. WILSON. We have had an instance or two in the last 2 years in Durum wheat sales to Japan, where we have known the price relationships and there seems to have been a decision made to purchase Canadian Durum, which quality wise is about the same, and in several instances we know the price of U.S. Durum has been considerably lower and yet purchases were made from Canada. This was a decision made, either by Japanese grain companies or by the food agency.

One of the problems, as I mentioned in my prepared statement, is that all sales of grain to Japan must be through a Japanese company. U.S. companies cannot sell direct to the Japanese Food Agency, while at the same time we have, I think, approximately 14 Japanese grain companies which are allowed to operate freely within the United States. But we don't have the same equal reciprocity on their side. And that is, I think, a problem. It certainly has some impact on competitiveness and transparency of transactions.

I think in general our access is fairly equal with everyone else, but obviously, particularly in the case of corn and other feed grains, sales could be much higher if prices were lower. I think it would be the development of an attitude to agriculture in Japan that doesn't exist in their current pricing relationships.

Senator BENTSEN. Sometime I think what your association should do is take a full page in some of the Tokyo papers, take it for several weeks, and compare the price for a manufacturer's product in the United States with the artificially escalated price in Japan.

We get lobbied here by all kinds of countries wanting foreign aid. They come in and take a full page ad with the prime minister or somebody else signing it. We read it that morning with our breakfast, those of us in Congress. Maybe if some of the members of parliament over there, or the government forces, would read that morning after morning, maybe some of those housewives would give them a little pillow talk. Maybe we'd get some kind of a reaction where they felt that there were some bargains waiting for them in the world market if they opened up the door to free trade.

I was visiting with the trade minister of France not too long ago and I started talking about the subsidies. He said: "But you subsidize too, on agriculture." I said, "That's right, but there's a big difference." The point—you made it—is that they subsidize to expand production. Now they have a big surplus as a result, and they choose to go out and dump it on world markets. We subsidize to try to curtail production. It's a pretty strange world.

Gentlemen, I appreciate your testimony very much. I think what you have given to us is very responsive, very productive. You have made a very strong case. I know this information will be used and referred to by a great many as they concern themselves with our foreign policy and this trade question.

Thank you very much. The subcommittee stands adjourned.

[Whereupon, at 11:15 a.m., the subcommittee adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record:]



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April 1, 1985

Mr. George Tyler, Economist
Joint Economic Committee
Senate Hart Bldg., Rm. 804
Washington, D.C. 20510

Dear Mr. Tyler:

This is in response to your letter regarding Senator Proxmire's question on my testimony before the Joint Economic Committee. He wanted elaboration on my comments that steps taken to protect import sensitive industries have adversely affected U.S. wheat exports.

My comments related primarily to the textile issue and to a lesser extent, steel and copper. These industries have been adversely affected by the strong dollar and they have attempted, with some success, to restrict imports into this country. Because many of our wheat purchasing countries have seen their exports to the United States affected by these restrictive steps, they have been inclined to look elsewhere for their wheat requirements. We estimate that the textile dispute with the People's Republic of China resulted in a loss of sales of 750 million bushels of wheat valued at more than \$2.6 billion. Thus, I would conclude that trade retaliatory measures--whether they be domestic content legislation, import quotas or an import surtax--encourage retaliation and often affect other innocent bystanders such as the U.S. wheat trade. This is certainly true if such steps are taken abruptly and without giving the other side much of an opportunity to have a fair hearing of their views, as was clearly the case in the textile "country of origin" rule change.

I hope this is helpful to you.

Sincerely,



Winston Wilson
President