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S. HRG. 101-1291

JAPAN'S ECONOMIC CHALLENGE

HEARINGS

BEFORE THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

OCTOBER 16, 18, AND DECEMBER 4, 6, 1990

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

48-136 ⇆ WASHINGTON : 1992

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-039260-8

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JAPAN'S ECONOMIC CHALLENGE

TUESDAY, OCTOBER 16, 1990

U.S. CONGRESS,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The committee met at 10 a.m. in room 2359 of the Rayburn House Office Building, the Hon. Lee H. Hamilton (chairman of the committee) presiding.

Present: Representatives Hamilton and Scheuer, and Senator Bingaman.

Staff Present: Richard Kaufman, Dorothy Robyn, and Carl Delfeld.

OPENING STATEMENT OF SENATOR BINGAMAN, PRESIDING

Senator BINGAMAN [presiding]. The hearing will come to order. Today, the Joint Economic Committee begins a series of hearings on the Japanese economy, focusing on the challenge that the Japanese economy presents to the United States.

We rely to a large extent on a major study which is about to be released by the Committee entitled Japan's Economic Challenge. The study consists of 35 papers on a variety of subjects contributed by scholars and specialists, both in government and in the private sector.

This was planned and coordinated with the help of the Congressional Research Service of the Library of Congress, and we hope it will be issued—and expect it to be issued—very shortly.

Papers by two of the contributors to this study are also testifying today concerning the Keiretsu and the government/business relations, and those papers are being released today.

We believe this study will be an important addition to the literature on Japan's economy and the understanding that Congress has not only of how the system works, but why it works, some of the problems that exist and what the consequences are for the United States in the 1990s.

Japan has become of course the world's second largest industrial power in a relatively short time. It is competitive in many markets and leads the world in a growing list of technologies, and is a model that many developing countries throughout the world are seeking to emulate.

This morning, to help us understand the phenomenon, we have a very knowledgeable and expert panel. Ronald Dore is an Adjunct Professor of Political Science at MIT and a Professor and Director of the Japan-Europe Industry Research Center at the University of London.

Phyliss Genther is Director of the Japan Technology Program in the Technology Administration of the Department of Commerce; and Dick Nanto is head of the Japan Task Force and a specialist in industry and trade in the Congressional Research Service in the Library of Congress.

We welcome all of the witnesses and appreciate your willingness to share your views with us. The format we'll try to follow today is to have about 10 minutes of presentation, a summary of your testimony by each of you. Then, after all of the presentations have been made, we would go to questions at that time.

I'm informed that Chairman Hamilton will be here probably in half an hour to 45 minutes. So we will look forward to him being here, at least for the questioning part.

Did you have an opening statement?

Representative SCHEUER. No. I prefer to let the witnesses speak to us. Certainly, this question is uppermost among all of those facing us:

What lessons do we have to learn from the extraordinary success of the Japanese? What lessons that are applicable to us and to our traditions, our culture, our inheritance?

It seems to me that we do have some lessons in terms of ability to save, ability to invest in research and development and new plant and equipment, about to control a country's zest for excessive consumer spending of the kind we've engaged in, the sort of a binge that has characterized the last decade in America? How we train an adequate flow of young scientists, mathematicians, engineers? And how we produce a technically competent and competitive work force when you have a 25 percent rate of adult illiteracy, and when you have a 25 percent rate of dropouts from high school?

It's going to be tough to really be a competitive economy and a competitive society. So I think there are a great many things that we can learn from the Japanese that are applicable to us and are appropriate for us.

I suppose, above and beyond all that, we have to think about how we can induce the Japanese to open up their society more, to open up their markets more, to reduce this apparently impenetrable thicket of impediments of all kinds that prevent American firms having access to the Japanese markets.

Then, I suppose we have to come to some decision that there may be a limit to what we can do to get the Japanese to open up. There may be some strong cultural and business imperatives, the baggage of the past, that's going to limit the ability of our country to penetrate the Japanese market.

We may at some time have to say, well, this is it. Let's make the best of the bad deal and how we maximize our ability to go on from there, creating as best a relationship as we can with the Japanese.

So, these are all the kinds of things I hope to hear this morning.

Senator BINGAMAN. Thank you very much, Congressman Scheuer.

Why don't we start with Mr. Nanto, then hear from Ms. Genther and Mr. Dore.

Thank you very much for being here.

STATEMENT OF MR. DICK K. NANTO, SPECIALIST IN INDUSTRY AND TRADE, ECONOMICS DIVISION, CONGRESSIONAL RESEARCH SERVICE

Mr. NANTO. I would like to thank the Committee for the invitation to testify in this hearing, and commend it for addressing this most important topic.

As you know, the Congressional Research Service does not take any position with regard to pending legislation.

I would also like to take this opportunity to thank all of the authors who contributed papers to the JEC–CRS Study on Japan's Economic Challenge. Their analysis and insights into how the Japanese economy works have been most useful.

It is apparent from studying the economic challenge of Japan that much of its economic power centers on its corporations. Japan's corporations are huge and strong. In the Business Week 1990 listing of the 1,000 global corporations, 333 were Japanese, while 329 were American.

Out of the top 15 companies in the world by market value, 10 were Japanese while 4 were American. Now, with the 40 percent decline in the Japanese stock market, that could change a little. But, the point, I think, remains: Japan has a considerable number of very large and very powerful corporations, given that their nation's size is one-half that of the U.S.

The sources of Japan's corporate strength derive partly from internal management and effort, but also reflect the environment in which they operate. And I think we've found from the Eastern Block Reforms that the environment that a business operates in, the system that it operates in, greatly affects its growth and its competitiveness.

Today, I would like to focus on one aspect of Japan's business environment. That is the Keiretsu or industrial groups. As the Japanese economy has grown it has developed some fairly distinctive institutions that have only vague parallels in other nations. The Keiretsu are one such institution. These are large conglomerate groups, diversified groups of businesses. There are also what are called the vertical keiretsu, those that operate in one industry and have many companies either under them or farther down the distribution system.

The firms belonging to the keiretsu run the gamut of all the Japanese industries with the exception of government monopolies, and there aren't too many in agriculture. But, they comprise virtually all industries, all manufacturing, all services.

During the recently completed Structural Impediments Initiative, the keiretsu were one of the topics of the talks. The United States claims that such close links among Japanese corporations can promote preferential group trade, negatively affect foreign direct investment in Japan and give rise to anti-competitive business practices.

The United States also claims that the industrial groups can hinder market access by U.S. firms and allow member companies to generate high profits at home, thus, enabling them to lower profit margins and gain market share abroad.

The long-term buyer-supplier relationships also can lock out foreign suppliers, even those with superior products, while supplier-distributor links can prevent retailers from carrying competing products and can hinder price competition.

The cross-share-holdings among keiretsu firms also can impede foreign acquisitions of Japanese companies.

Let me talk first about the conglomerate or the diversified keiretsu. These are usually centered around trading companies or banks. I've included in my statement a figure that summarizes some of the main conglomerate groups.

There are six major groups. Among the six, three have origins in the pre-war industrial combines that are called zaibatsu in Japan. These are Mitsubishi, Mitsui and Sumitomo. There are others that are centered around banks, such as Fuyo, DKB and Sanwa.

For example, the Mitsubishi group, the one that we hear a lot about in the news, is centered on the Mitsubishi Trading Company, the Mitsubishi Bank and Mitsubishi Heavy Industries. Mitsubishi has 35 other companies that are in affiliated industries.

When we ask the question how are these keiretsu organized and how do they operate, we see that they have various ways to tie themselves together. These include the cross-holding of shares, intra-group financing by a common bank, the use of trading companies for marketing, and also presidential councils.

The extent of cross-shareholding runs from about 14 to 22 percent depending on the keiretsu that you're addressing.

Now, in the Japanese economy as a whole, about 60 percent of all stocks are held by other corporations. So, this is not something that's limited to only the keiretsu. These mutual shareholdings help reduce pressures on short-term profits. They can protect against hostile takeovers. They can bolster sagging stock prices. And, they can act as a substitute for a holding company, which is outlawed in Japan.

As for the intra-group financing by member banks, the member banks are allowed to hold 5 percent of the stocks of any corporation. And they can fund up to 30 percent of any corporation's loans. The Presidential Councils comprise the presidents of the major corporations in the group; they meet monthly. This is down from weekly as recently as 10 or 15 years ago. So, it appears that the Presidential Councils are becoming less important. They talk about mutual items of interest, especially promising business activities, research and development and financial conditions.

At the center of several of the large conglomerates are trading companies. Let me take a minute just to talk about the trading companies. These are huge companies that operate diverse businesses on their own while producing many services to member firms. They procure raw materials, distribute products finance activities, organize vast projects, gather intelligence, assume exchange risk, and so forth.

The trading companies traditionally have been the primary link between the domestic and foreign activities of the keiretsu. In 1988, the nine largest trading companies in Japan accounted for 42 percent of all exports and 74 percent of all imports. So, they have tremendous market power. And because there are so few of them, the Japanese government is able to counsel them and to exert adminis-

trative guidance to dampen imports of specific goods that are a problem. This has happened in the past in steel and textiles.

Within the keiretsu, the intra-group buying usually is about 10–20 percent and is declining as the keiretsu become larger and larger.

During a severe recession, however, the conglomerate keiretsu could implode on each other as other firms look to fellow conglomerate members for sales.

The vertical keiretsu in Japan are much like large corporations in other parts of the world. These are independent industrial groups that are usually centered on one or a few industries. There are no strict criteria for defining what a vertical keiretsu is. But, if you look at the 39 groups with sales exceeding one trillion yen in 1987, you see names such as Toyota, Nissan, Honda, Mazda, Sony, Mitsubishi Electric, Hitachi, Toshiba, NEC, Nippon Steel, NTT and Sharp. These are all names that are very familiar to us.

In the vertical keiretsu, you also have cross-holding of shares, exchange of information, and so forth. However, the distinguishing feature of the vertical links is the close relationship between the buyer and supplier. This is one area that gives American businesses a lot of problems. These long-term links tend to pervade all of Japanese businesses, but they are the strongest in the keiretsu.

The supplier participates actively with the final manufacture in designing products and upgrading technology. The buyer is often allowed to examine the supplier's books, so many cost savings are passed on to the final manufacturer to be incorporated into the wholesale price or retail price of the product.

So, the supplier is an integral link in the competitive strategy of a Japanese manufacturer.

This is somewhere in between an in-house producer, which is common in a company like General Motors, and a free, sort of arm's length, open bidding system that is also used quite a bit in the United States.

The ties are bolstered by such things as personnel exchanges. They have very loose contractual relationships. They're based on long-term trust so that, if problems occur, problems are worked out according to the trust that they have in each other, and the fact that they know that they're going to be working with each other for a long time.

The long-term relationships also substitute for legal work in Japan, since, in Japan, most problems are resolved between suppliers and buyers through mutual trust and negotiation rather than by resorting to law and litigation.

The vertical keiretsu also include distribution systems, especially in certain products like consumer electronics, automobiles, cosmetics, confectioneries and musical instruments. This is clear and a manufacturer will actually own the entire distribution system all the way down to the retailer.

Matsushita, which makes Panasonic and national brand name products, has 24,000 of its own shops and sells about half of its home appliances through these shops that it owns.

Japan has an anti-monopoly law that prohibits practices such as resale price maintenance, exclusive dealing stipulations and cus-

tomer restrictions. However, the sanctions are so weak that the law appears to have very little effect.

When successful anti-trust proceedings are brought against a company, the result is usually a cease and desist order rather than a penalty.

This keiretsu system exists in Japan, and any change is likely to be marginal and in response to economic as well as political pressures. As Japan's distribution system is modernized, however, the single-brand stores are likely to decrease in importance relative to large-scale marketers.

In the case of cameras in Japan, in Tokyo there is a large seller called Yodobashi Camera. This camera store discounts cameras and sells a large proportion of all cameras sold in Tokyo. Japan's camera-makers have been forced to deal with this discounter and, in the process, have lost control over much of their prices.

One question is whether the keiretsu in and of themselves constitute illegal cartels. It appears in examining them that they do not in the sense that vertical integration or diversified operations are not illegal, per se. However, the fact that they exist makes violations of anti-trust law easier, and also it's easier to administer guidance by the government, particularly if the government wants to enforce that guidance.

There are cartels in Japan that are legal. There are three types. There are government export cartels—for example, the voluntary export restraints on automobiles are administered through a type of cartel. There are recession cartels that allow companies, industries to adjust to recessionary conditions, and rationalization cartels that allow industries to adopt new technology.

The latter two types of cartels both must be approved by Japan's Fair Trade Commission.

Let me mention a couple of things about the Japan Fair Trade Commission. Japan Fair Trade Commission was modeled after the U.S. Federal Trade Commission; it was created in 1947, and it handles about 500 cases a year.

In the late 1980s, the number of violations that it found seemed to drop, although, in 1988, it has suddenly become a little more aggressive in that it did levy a surcharge of $2 million on Japanese contractors who were conspiring to fix bids for projects on the U.S. Naval Base at Yokosuka.

The contention of the United States is that Japan Fair Trade Commission is under-budgeted, under-staffed and lacks enough clout to prevent abuses of monopoly power. It is one of the weakest agencies in the Japanese government.

The United States also has pointed out the disincentives for private companies or groups to file anti-trust suits in Japan. Such suits are permitted, but they are rare and financial settlements are modest.

Now, in the Structural Impediments Initiative, the Japanese government indicated that it intended to make the keiretsu more open and transparent, that it intended to strengthen the JFTC and have it enforce the anti-monopoly law more strictly. The Japan Fair Trade Commission is to monitor transactions among the keiretsu and publish a detailed analysis of the keiretsu system every two years. It is also to establish guidelines to ensure that transactions

among companies in the keiretsu groups do not discriminate against foreign firms. It will be very important for the United States to follow up and make sure that this happens.

The issue of the keiretsu has also reached the U.S. operations of Japanese companies. The U.S. Federal Trade Commission has begun a probe of Japanese automobile companies and their parts suppliers operating in the United States. This investigation is to determine whether or not their propensity to buy components from suppliers in which they hold a financial interest illegally discriminates against competing parts makers.

To say that keiretsu exists in Japan is not to say that competition in Japan is bridled. Among the keiretsu companies, competition is very fierce. In fact, each of the major groups strives to have competitive firms in each of the major industries. We can see that competition is fierce because of the rate of technological change and the new products coming out of the keiretsu companies.

The keiretsu companies, however, do exclude outsiders. That is, not only foreign outsiders but also Japanese outsiders. This does not imply that U.S. firms cannot be successful in Japan; indeed, the rapid increase in imports of manufactured goods into Japan since 1985 indicates that even the keiretsu are willing to buy competing products from abroad.

In fact, some American companies have used the keiretsu system to get into Japanese markets. In terms of reciprocity and equity, however, the ease with which Japanese companies can buy into U.S. firms compared with the difficulty of U.S. firms to do likewise in Japan because of the cross-shareholdings offends the sense of fairness of many Americans.

Also, the lack of transparency in dealings between the government and the keiretsu continues to be a problem. The U.S. insistence that administrative guidance by the government be given in writing rather than in informal meetings seems to have merit. Even Japan's Keidanren, the voice of big business, supports this change.

U.S. pressures on the system through the Structural Impediments Initiative, another forum, are likely to speed up the process of liberalization and can restore some of the power of the JFTC to pursue abuses among keiretsu companies.

It was interesting that the U.S. demand that the JFTC be strengthened was also supported by the JFTC itself. It also gets some support from Keidanren, although Keidanren considers the keiretsu, in general, to be a strength of Japan.

The fastest changes in the keiretsu system are likely to occur in distribution. The economic rationale for the vertical buyer-supplier relationship is so strong that such keiretsu are unlikely to change much. In fact, many American companies are adopting the same policy.

The conglomerate keiretsu are likely to grow rather than to shrink, although coordination among member companies are likely to diminish as individual companies become more independent and networking outside the keiretsu becomes more common.

Recently, I was at a meeting where Akio Morita, the Chairman of Sony, was speaking. He was asked what he thought about the

keiretsu, referring to the conglomerate keiretsu. His reply was that:

Every firm would like to have a guaranteed market for some of its output. Some day, he would like Sony itself to be a keiretsu.

That seems to be the attitude of most Japanese big business. Stronger anti-monopoly enforcement, therefore, is not likely to lead to the demise of the keiretsu.

Thank you.

[The prepared statement of Dick Nanto follows:]

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Japan's Industrial Groups, The *Keiretsu*

Testimony prepared for the
Joint Economic Committee Hearings on
Japan's Economic Challenge

October 16, 1990

By
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INTRODUCTION

I would like to thank the Committee for the invitation to testify in this hearing and commend it for addressing this important topic. The Congressional Research Service does not take any position with regard to any pending legislation. I would like to take this opportunity to thank all the authors who contributed articles for the JEC-CRS study on Japan's economic challenge. Their analysis and insights into how the Japanese economy works and its interaction with the United States has been most useful.

It is apparent from studying the economic challenge of Japan that much of its economic power centers on its corporations. Japan's corporations are huge and strong. In the *Business Week* 1990 ranking (by market value) of the Global 1000 corporations, 333 were Japanese, while 329 were American. Of the top 15 companies in the world, 10 were Japanese while 4 were American.[1] This is quite remarkable considering that the U.S. economy is twice the size of Japan's.

The sources of Japan's corporate strength derive partly from internal management and effort, but also reflect the environment in which they operate. One lesson the world has learned from the Eastern Bloc reforms is that the environment or system in which a business operates greatly affects its growth and competitiveness. Today, I would like to focus on one aspect of Japan's business environment, the *keiretsu*, or industrial groups.

As the Japanese economy has grown, it has developed some fairly distinctive institutions that have only vague parallels in other industrialized nations. The *keiretsu* are one such institution. They consist of either conglomerate or vertical groupings of companies that are characterized by long-term association, cross-holdings of stock, extensive business dealings, and, sometimes, sharing of company name.

The firms belonging to *keiretsu* organizations run the gamut of the manufacturing and service sectors in Japan. The conglomerate *keiretsu* include firms in finance and insurance, trading and commerce, mining, construction, manufacturing, real estate, warehousing, and transportation—almost all industries except for air transportation, communication, and electrical power in which government monopolies tend to prevail. Vertical *keiretsu* usually are centered on large industrial manufacturers.

The *keiretsu* were one of the targets of the recently completed Structural Impediments Initiative talks between the United States and Japan. The United States claimed that such close links among Japanese corporations can "promote preferential group trade, negatively affect foreign direct investment in Japan,

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[1] The Global 1000. *Business Week*, July 16, 1990. p. 111–142. In the top 15 companies by profits, however, only 1 is Japanese, while 9 are American.

and give rise to anticompetitive business practices."[2] The United States also claimed that the industrial groups can hinder market access of U.S. firms and allow member companies to generate high profits in protected markets at home, thereby enabling them to lower profit margins and gain market share abroad. The long-term, buyer-supplier relationships also can lock out foreign suppliers, even those with superior products, while the supplier-distributor links can prevent retailers from carrying competing products and can hinder price competition. The cross-holdings of shares also can impede foreign acquisitions of Japanese companies.

THE CONGLOMERATE *KEIRETSU*

The conglomerate[3] *keiretsu* usually are centered around trading companies and/or banks. As shown in the following figure, the six major conglomerate groups include three with origins in the prewar industrial combines or *zaibatsu* – Mitsubishi, Mitsui, and Sumitomo – and three that are bank centered – Fuyo (Fuji Bank), DKB (Dai-ichi Kangyo Bank), and Sanwa (Sanwa Bank).

For example, the well-known Mitsubishi Group is centered on the Mitsubishi Corporation (a trading company), Mitsubishi Bank, and Mitsubishi Heavy Industries. The affiliated Mitsubishi companies include 35 firms in insurance, construction, food, textiles, paper, chemicals, petroleum, glass, cement, steel, nonferrous metals, machinery, electronics, transportation machinery, optical instruments, shipping, real estate, and warehousing.[4]

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[2] Comments of the U.S. Delegation on the Interim Report by the Japanese Delegation. Appended to *Japan-U.S. Structural Impediments Initiative, Interim Report by the Japanese Delegation.* April 5, 1990. Released by the White House, Office of the Press Secretary, April 5, 1990.

[3] Some authors refer to the conglomerate *keiretsu* as horizontal *keiretsu*. Horizontal integration, however, usually refers to firms producing similar products, e.g., Chrysler's acquisition of American Motors.

[4] Dodwell Marketing Consultants. *Industrial Groupings in Japan.* 8th Ed. 1988/89. Tokyo, Dodwell, 1988. p. 47ff.

Figure 1.

JAPAN'S INDUSTRIAL GROUPS
THE KEIRETSU
Conglomerate Groups
Six Major Groups
Zaibatsu Origin
Mitsubishi
Mitsui
Sumitomo
Bank Centered Groups
Fuyo
DKB
Sanwa
Tokai
IBJ
Vertical Groups
Total of 39 including:
Nippon Steel
Hitachi
Nissan
Toyota
Matsushita
Toshiba
NEC
NTT
Seibu Saison
Nippon Oil
Mitsubishi Electric
Note: Prepared by CRS

The six major *keiretsu* organized into conglomerates use a variety of methods to tie their enterprises together. These include:

- crossholdings of shares
- intra-group financing by a common bank
- presidential councils
- mutual appointments of officers
- use of trading companies for marketing and organizing projects
- joint investments in new industries.

The extent of stock crossholdings among the conglomerate *keiretsu* ranges from about 14 to 22 percent of total paid-up capital. These holdings of stock are rarely sold.[5] For the total Japanese economy, cross-shareholdings account for about 60 percent of all stock. The mutual share holdings reduce pressures on companies to increase short-term profits, protect against hostile takeovers, help bolster sagging stock prices, act as a substitute for holding companies which are prohibited by law, and sharpen the separation between management and ownership in such Japanese companies.

The main banks in the *keiretsu* not only hold shares of the member companies, but individual companies rely on their main bank for as much as 30 percent of their loans.[6] Member companies also exchange information with the bank and maintain large deposits there. During credit crunches, the *keiretsu* family bank will tend to grant preferential access to loans for member firms and soften repayment terms when necessary.

The presidential councils include the presidents of the leading companies of the group, who meet periodically (usually monthly) to discuss matters of mutual interest. While the councils claim not to be policy making bodies for the group (as were the prewar holding companies), they do discuss such topics as economic and financial conditions, promising business activities, research and development, intra-group trademarks, and labor problems. They also can decide on joint investments in new industries, political contributions, public relations, rehabilitation of troubled member companies, and key personnel appointments.[7]

At the center of several conglomerate *keiretsu* are general trading companies.[8] These huge companies operate diverse businesses on their own while providing many services to member firms. They procure raw materials, distribute products, finance some activities, organize vast projects, and gather and disseminate

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[5] Since most companies carry these stocks at their historical value, many Japanese companies have balance sheets in which net worth is considered to be understated.

[6] Article 11 of Japan's Antimonopoly Law, however, limits holdings by financial companies to 5 percent of the total outstanding stock of any Japanese company.

[7] Dodwell, *Industrial Groupings*, p. 9.

[8] General trading companies are referred to as *Sogo Shosha* in Japanese.

intelligence. Since trading companies are involved in both importing and exporting, they can absorb considerable foreign exchange risk for the group.

The trading companies traditionally have been the primary link between domestic and foreign activities. In 1988, the nine largest general trading companies accounted for 42 percent of all Japan's exports and 74 percent of all imports. Hence, they wield considerable market power and understandably can be reluctant to import products that compete with those of member companies. Since such a high proportion of Japan's imports are concentrated in the hands of these few firms, moreover, the government is better able to exert "administrative guidance" to dampen imports of particular goods. This has happened in the past in steel and textiles.[9]

Within the *keiretsu*, intra-group buying appears to be declining, although it still can be quite significant, particularly for capital goods. On average, intra-group purchases account for 10 to 20 percent of the buying by *keiretsu* firms. As long as markets continue to expand, intra-group trading as a percent of total trade will likely diminish. During a severe recession, however, conglomerate *keiretsu* could implode upon each other as firms look to fellow conglomerate members for sales.

THE VERTICAL *KEIRETSU*

In addition to the huge conglomerate *keiretsu*, numerous vertically integrated groups exist in Japan. These independent industrial groups resemble the corporate behemoths elsewhere in the industrialized world.

The groups usually are headed by one or more large industrial concerns and are commonly concentrated in one or a few industries. Normally, the affiliated firms maintain vertical buyer-supplier relationships, although ties with horizontal firms also are common.

There are no strict criteria for distinguishing a vertically integrated *keiretsu* from other large vertical groupings. One recognized authority identifies 39 groups whose sales exceeded one trillion yen in 1987. The list includes companies whose brand names boast world-wide recognition: Toyota, Nissan, Honda, Mazda, Sony, Mitsubishi Electric, Hitachi, Toshiba, NEC, Nippon Steel, NTT, and Sharp.[10]

As with the conglomerate *keiretsu*, vertical *keiretsu* firms hold each other's shares, exchange information, and cooperate in new ventures. Since the relationship is vertical, however, the closest ties are between buyers and suppliers or between maker and distributor in the group. For example, under Toyota Motor stand 22 firms making auto parts or assembling sister products (such as looms). Toyota also owns dealerships, an insurance company, and three ventures in non-automotive fields.

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[9] Lincoln, Edward J. *Japan's Unequal Trade*. Washington, Brookings Institution, 1990. p. 88.

[10] Dodwell Consultants, *Industrial Groupings*, p. 141.

The distinguishing feature of the vertical links in Japan (and one that U.S. firms also are adopting) is the close relationship between the parent company and its suppliers. Such long-term links tend to pervade all Japanese businesses, but are the strongest within the *keiretsu*. The supplier participates actively with the final manufacturer in designing products, upgrading technology and manufacturing processes, and implementing quality control. The buyer usually is allowed to examine the supplier's books, and cost savings generally are passed on to the final manufacturer to be incorporated into the retail price of the product. The supplier is an integral link in the competitive strategy of a Japanese manufacturer.

The traditional Japanese system of permanent employment reinforces the vertical *keiretsu* system. Not enough jobs always exist for each permanent employee (about a third of the work force) as he is promoted, so *keiretsu* manufacturers rely on suppliers or distributors to accept employees, either upon retirement or on detail. Hence, personnel links buttress the financial and other *keiretsu* ties.

The close links also substitute for legal work in Japan. Contracts often do not contain the detailed specifications and contingency clauses common in the United States. If a problem arises, the relationship of mutual trust allows the companies to work out a satisfactory solution. This reflects the fact that in Japan, resorting to law and litigation is usually regarded as the least preferred means of resolving disputes.[11]

Contracts, however, often will require high levels of quality control, prices that decline over time, and just-in-time delivery. Such exacting requirements on the supplier mean that the buyer and supplier must have a special, close relationship. There must be trust, loyalty, a mode of operation that allows for problems to be worked out in a mutually satisfactory manner, enough confidence in the relationship that the supplier is willing to invest in new technology, and a sharing of production and cost data that normally might be considered proprietary. Such relationships go far beyond arms-length transactions.

While certain efficiency considerations favor the buyer-supplier *keiretsu*, distribution *keiretsu* also exist in Japan. This other side of the vertical *keiretsu* extends from the manufacturer through distributors and even to retailers. Much like automobile dealership franchises, some Japanese makers maintain exclusive wholesale and retail networks. These are common in automobiles, electrical appliances, cosmetics, confectioneries, and musical instruments. Discipline is maintained in the distribution system through providing capital and rebates.

Matsushita Electric Industrial Company, the maker of National and Panasonic brand name products, for example, sells half of its home appliances through

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[11] Hiroshi, Iyori. Antitrust and Industrial Policy in Japan: Competition and Cooperation. In *Law and Trade Issues of the Japanese Economy*, ed. by Gary R. Saxonhouse and Kozo Yamamura. Seattle, University of Washington Press, 1986. p. 62.

24,000 of its own shops. Similarly, 11,000 shops belong to the Toshiba *keiretsu*, 9,000 to Hitachi, 5,000 each for Sanyo and Sharp, and 3,000 for Sony.[12]

Japan's antimonopoly law prohibits practices such as resale price maintenance, exclusive dealing stipulations, and customer restrictions. The sanctions, however, are so weak that the law appears to have little effect. When successful antitrust proceedings are brought against a company, the result is usually a cease-and-desist order rather than a penalty.[13]

One allegation made by several U.S. exporters is that Japan's *keiretsu* distribution system allows Japanese companies to generate large profits at home while raising market share in foreign markets by price cutting. In theory, such behavior can lead to the dumping of products abroad, particularly when excess production capacity exists in Japan.[14] Recent price surveys indicate that prices are high in Japan, although the comparisons vary by product and change as exchange rates fluctuate. Retailers in Japan, moreover, seem to prefer to return merchandise rather than to sell it at a discount, and Japan's exporters often allocate funds for foreign market development that probably originate from domestic profits. Toyota Motors, for example, lost money on its U.S. distribution system for years before it began to turn a profit.

Any change in Japan's vertical *keiretsu* is likely to be marginal and in response to economic as well as political pressures. As Japan's distribution system is modernized, however, the single brand stores are likely to lose business to the large-scale marketers. In the case of cameras, the discounters, such as Yodobashi Camera in Tokyo, sell in such volume that Japan's camera makers have been forced to deal with them. In the process, the camera makers have lost much of their control over prices. The loosening of import restrictions, moreover, means that Japanese firms will no longer be able to continue the practice of charging higher prices domestically, thereby, fattening their profit margins at home in order to shave them abroad.

One question is whether the *keiretsu*, in and of themselves, constitute illegal cartels. It appears that they do not. A cartel is a combination of private enterprises supplying like commodities or services that agree to engage in restrictive practices for a specific product. *Keiretsu*, particularly the conglomerate *keiretsu*, produce thousands of different products. The fact that a small number of very large *keiretsu* firms dominate many Japanese markets, however, implies that collusive behavior, particularly if sanctioned through "administrative guidance" by the government, is easier to enforce.

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[12] Sekiguchi, Waichi. Electronics Firms Aim to Keep Keiretsu. *The Japan Economic Journal*, June 2, 1990. p. 3.

[13] Flath, David. Vertical Restraints in Japan. *Japan and the World Economy*, v. 1, 1989. p. 187.

[14] Most recent antidumping cases against Japan deal with industrial materials or products not sold in Japan through a *keiretsu* distribution system.

The cartels that have existed in Japan are usually of three types: government-organized export cartels designed to ease trade friction, cartels to rationalize industries, and cartels to reduce capacity in depressed industries. In the export cartels, the government monitors industry behavior and enforces the limits on exports. The rationalization cartels are formed by the government at the request of industry to control production while firms undergo modernization – usually to adopt new, lumpy technology. Depressed industry cartels usually allocate production and maintain prices in unprofitable industries while they undergo long-term adjustment to restore profitability. Both types of cartels must be approved by Japan's Fair Trade Commission.

THE JAPAN FAIR TRADE COMMISSION

The Japan Fair Trade Commission (JFTC) was created by the U.S. Occupation authorities in 1947 and serves as Japan's watchdog agency dealing with antitrust laws. The JFTC handles as many as 500 cases per year. Not all, of course, involve the *keiretsu*. In 1975 and in 1976, it found more than 30 violations of the antimonopoly law (mostly price-fixing agreements). After that, however, violations averaged only about 11 per year, and, in 1986 and 1987, dropped to about 5 per year.

As the 1980s ended, however, the JFTC seems to have become more aggressive. In December 1988, it levied a surcharge of ¥290 million ($2.04 million) on 70 firms for conspiring to fix bids for projects at the U.S. Navy base at Yokosuka. It also punished construction companies for similar activities at the Osaka airport project and issued a written warning to 36 firms suspected of forming a cartel to import beef.[15]

The contention of the United States is that the JFTC is underbudgeted, understaffed, and lacks enough clout to prevent abuses of monopoly power. The JFTC is one of the weakest agencies in the Japanese government.

The United States also has pointed out the disincentives for private companies or groups to file antitrust suits in Japan.[16] Such suits are permitted, but they are rare and financial settlements are modest.

In the Joint Report of the U.S.-Japan Working Group on the Structural Impediments Initiative, the Japanese government indicated that it intended to make the *keiretsu* system more open and transparent, strengthen the JFTC and have it enforce the antimonopoly law more strictly. The JFTC is to monitor the transactions among *keiretsu* firms to determine whether or not they are being conducted in a manner that impedes fair competition. Roughly every two years, the JFTC is to conduct a detailed analysis of various aspects of the *keiretsu* groups, including supplier-customer transactions, financing arrangements,

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[15] Holloway, Nigel. Freeing the Watchdog. *Far Eastern Economic Review*, October 19, 1989. p. 48.

[16] Anti-monopoly Law Revision Urged. *The Japan Economic Journal*, February 17, 1990. p. 12.

personal ties, and the role of trading companies. It is to publish the results and take steps, including stricter enforcement of the Antimonopoly Act, to address anti-competitive and exclusionary practices uncovered. The JFTC, with the assistance of an advisory group, is also to establish guidelines to insure that transactions among companies in *keiretsu* groups do not discriminate against foreign firms.[17]

The issue of the *keiretsu* has also reached the U.S. operations of Japanese companies. The U.S. Federal Trade Commission has begun a probe of Japanese automobile companies and their parts suppliers operating in the United States. The investigation is to determine whether or not their propensity to buy components from suppliers in which they hold a financial interest illegally discriminates against competing parts makers.[18]

One question is whether or not *keiretsu* organizations would be legal or subject to antitrust enforcement in the United States. *Keiretsu* organizations, in and of themselves, do not appear to violate U.S. antitrust law. Neither vertically integrated nor diversified business organizations, per se, are prohibited except as they violate laws governing monopolies, restraint of trade, or other specific behavior.

U.S. antitrust law may be applied to the activities of the *keiretsu* in Japan if such transactions have a "substantial and foreseeable effect on U.S. commerce." The decision to pursue such extraterritorial jurisdiction usually requires certain factors to be weighed as a matter of international comity and fairness.[19]

IMPLICATIONS FOR U.S. POLICY

The *keiretsu* are a fact of life in Japan and are not likely to change significantly in the near future. Over time, however, all such arrangements tend to weaken because member companies grow so large that company policies become difficult to enforce, subsidiaries become financially independent, and the product lines of member firms become so complicated that the parent company can no longer provide meaningful guidance for them. Obviously, however, U.S. firms attempting to enter the Japanese market cannot wait for this process to develop.

To say that Japan's *keiretsu* exist is not to say that competition in Japan is bridled. Among the *keiretsu* companies, competition is ferocious. Companies compete, however, more in product quality and new features, rather than just price. The ferocity of this competition is attested to by the speed of technological innovation and the rapid decline in the cost of production in Japan's

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[17] Joint Report of the U.S.-Japan Working Group on the Structural Impediments Initiative. Washington, D.C., June 28, 1990. p. V1-V7.

[18] Trade. *Business Week*, June 4, 1990. p. 71.

[19] See ABA Antitrust Section, *Antitrust Law Developments* (2d ed. 1984). p. 530.

manufacturing sector. This makes the *keiretsu* different from government-sanctioned monopolies or other such uncompetitive (and anticompetitive) entities in other nations. Since competition is so intense, Japan's *keiretsu* companies tend to keep up with world developments in technology, manufacturing processes, and product development.

One important effect of the *keiretsu*, however, is to exclude outsiders, particularly foreign companies. This reflects attitudes in Japanese society as a whole, however. Japanese society tends to be more group oriented and more attuned to human relationships rather than pure price competition.

This does not imply that U.S. firms cannot be successful. Indeed the rapid increase in imports of manufactured goods into Japan since 1985 indicates that even the *keiretsu* are willing to buy competing products from abroad. The system can also be used to an American firm's advantage.

If U.S. firms perceive, however, that the *keiretsu* system is working to block their sales in Japan, pressures can be brought to bear on the system by the U.S. Government. One of the problems, however, is that U.S. firms with complaints are often reluctant to bring them to light for fear of jeopardizing their existing market in Japan.

In terms of reciprocity and equity, moreover, the ease with which Japanese companies can buy into U.S. firms compared with the difficulty of U.S. firms to do likewise in Japan offends the sense of fairness of many Americans.

The United States has not argued that long-term, *keiretsu*-type relationships that make economic sense are wrong. Indeed, relationships based on trust that reduce the need for legal work enhance the efficiency of producers. A problem with the *keiretsu*, however, is that the close coordination among group members facilitates violations of antitrust laws and dealings that can exclude U.S. exporters.

Also the lack of transparency in dealings between the government and the *keiretsu* continues to be a problem. The U.S. insistence that administrative guidance be given in writing rather than in informal meetings seems to have merit. Even Japan's Keidanren, the voice of big business, supports this change.[20]

U.S. pressures on the system through the SII and other fora are likely to speed up the process of liberalization and can restore some of the power of the JFTC to pursue abuses among *keiretsu* companies. The U.S. demand that the JFTC be strengthened was also supported by the JFTC, itself. Keidanren also favors a stronger JFTC, but it still considers the *keiretsu*, in general, to be a strength of Japan.

The fastest changes in the *keiretsu* system are likely to occur in distribution. The economic rationale for the vertical buyer-supplier relationships is so strong, that such *keiretsu* are unlikely to change much. The conglomerate *keiretsu*

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[20] Keidanren (Japan Federation of Economic Organizations). *Keidanren Position Paper on the Structural Impediments Initiative (SII) Talks*. March 13, 1990. Tokyo, Keidanren. p. 5.

are likely to grow rather than to shrink, although coordination among member companies is likely to diminish as individual companies become more independent and networking outside the *keiretsu* system becomes more common.

Recently, in Washington, D.C., Akio Morita, the Chairman of the Sony Corporation, was asked what he thought about the *keiretsu* (referring to the mammoth conglomerate *keiretsu*). His reply was that every firm would like to have a guaranteed market for some of its output. Someday, he would like Sony itself to develop into a *keiretsu*.[21] This seems to be the attitude of most of Japanese big business. Stronger antimonopoly enforcement, therefore, is not likely to lead to a demise of the *keiretsu*.

[21] Address before the Center for Strategic and International Studies' Congressional Staff Working Group, June 5, 1990. Washington, D.C.

JAPAN'S INDUSTRIAL GROUPS, THE *KEIRETSU*

By Dick K. Nanto*

TABLE OF CONTENTS

SUMMARY

As the Japanese economy has grown, it has developed some fairly distinctive institutions that have only vague parallels in other industrialized nations. Japan's *keiretsu*, or industrial groups, are one such institution. These consist of either vertical or conglomerate groupings of companies that are characterized by long-term association, cross-holdings of stock, extensive business dealings, and, sometimes, sharing of company name. The *keiretsu*, per se, do not violate Japan's antitrust laws, but their activities can.

The conglomerate groups consist of "families" of corporations spanning numerous industries and usually centered on trading companies and/or banks. They include three with origins in the prewar *zaibatsu* (industrial combines) – Mitsubishi, Mitsui, and Sumitomo – and three that are bank centered – Fuyo (Fuji Bank), DKB (Dai-ichi Kangyo Bank), and Sanwa (Sanwa Bank). The extent of stock crossholdings among the conglomerate *keiretsu* ranges from about 14 to 22 percent of total paid-up capital.

U.S. businesses have charged that the conglomerate *keiretsu* prefer to buy from other member companies rather than from outsiders, particularly foreign companies. While such intra-group buying appears to be declining, it still can be quite significant, particularly for capital goods. On average, intra-group purchases account for 10 to 20 percent of the purchases by *keiretsu* firms.

The vertically integrated groups include 39 blue chip manufacturers such as Nippon Steel, Toyota, and Matsushita Electric. These groups resemble the business empires found in all industrialized nations of the world. As with the conglomerate *keiretsu*, vertical *keiretsu* firms hold each other's shares, exchange information, and cooperate in new ventures. Since the relationship is vertical, however, the closest ties are between buyers and suppliers or between maker and distributor in the group.

The Japan Fair Trade Commission enforces the antitrust laws, which resemble those in the United States. It tends, however, to be understaffed and underbudgeted and recently has not been aggressive in prosecuting alleged antitrust violations. During the late 1980s, it found fewer than 10 violations per year.

American businesses can work around Japan's *keiretsu* system by pursuing several strategies. The system also has been one of the targets of the Structural Impediments Initiative talks

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From Japan's Economic Challenge, Joint Economic Committee, forthcoming

between the United States and Japan in 1989-90. Japan has promised to strengthen its antitrust laws and enforcement, but given the support for the *keiretsu* by Japan's business, government, and political elite, the *keiretsu* are not likely to disappear soon.

INTRODUCTION

As the Japanese economy has grown, it has developed some fairly distinctive institutions that have only vague parallels in other industrialized nations. Japan's *keiretsu*,[1] or industrial groups, are one such institution. These consist of either vertical or conglomerate groupings of companies that are characterized by long-term association, cross-holdings of stock, extensive business dealings, and, sometimes, sharing of company name. The *keiretsu*, per se, do not violate Japan's antitrust laws, but their activities can.

The *keiretsu* have been one of the targets of the Structural Impediments Initiative talks between the United States and Japan in 1989-90. The United States claims that the close links among Japanese corporations can "promote preferential group trade, negatively affect foreign direct investment in Japan, and give rise to anticompetitive business practices."[2] The United States also claims that the industrial groups can hinder market access of U.S. firms and allow member companies to generate profits in protected markets at home, thereby enabling them to shave profit margins and gain market share abroad. The long-term, buyer-supplier relationships also can even lock out foreign suppliers with superior products, while the supplier-distributor links can prevent retailers from carrying competing products and can hinder price competition. The cross-holdings of shares also can impede foreign acquisitions of Japanese companies and make trading in stocks of certain companies thin.

Many Japanese see the *keiretsu* as a natural outgrowth of their unique economic development and one of their greatest strengths in international competition. Along with the elite government ministries, the core companies of the *keiretsu* are the first choice for employment among Japan's top graduates each year. Japanese also point out that Germany has similar business organizations. Hence, it is the United States, not Japan, that is out of step with the rest of the world.[3]

In this paper, we first examine the types of *keiretsu* organization, discuss briefly Japan's Fair Trade Commission, and outline some implications for the United States.

TYPES OF INDUSTRIAL GROUPS

Japan's *keiretsu* can be classified into two types: conglomerate[4] and vertical. The conglomerate groups comprise firms in a variety of business activities and usually are centered

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[1] The *keiretsu* (kay-ret-sue) also are referred to as *zaibatsu* (financial cliques). *Zaibatsu*, however, has a negative connotation and usually refers to Japan's prewar industrial combines characterized by holding companies. At the end of World War II, Japan's four largest *zaibatsu* controlled about a quarter of the paid-in capital of Japan's incorporated business. (See: Hadley, Eleanor M. *Antitrust in Japan*. Princeton, Princeton University Press, 1970.)

[2] Comments of the U.S. Delegation on the Interim Report by the Japanese Delegation. Appended to *Japan-U.S. Structural Impediments Initiative, Interim Report by the Japanese Delegation*. April 5, 1990. Released by the White House, Office of the Press Secretary, April 5, 1990.

[3] Russell, David. America's Hollow Victory. *Business Tokyo*, v. 4, June 1990. p. 34.

[4] Some authors refer to the conglomerate *keiretsu* as horizontal *keiretsu*. Horizontal integration, however, usually refers to firms producing similar products, (continued)

around trading companies and banks. Firms in a vertical grouping will be centered on a major manufacturer and can include both suppliers and sellers within a specific sector. Vertical groups also can depend on the conglomerate group members for particular functions, such as procurement, financing, and distribution of finished products.

As shown in the following figure, the conglomerate groups include three with origins in the prewar *zaibatsu* (industrial combines) – Mitsubishi, Mitsui, and Sumitomo – and three that are bank centered – Fuyo (Fuji Bank), DKB (Dai-ichi Kangyo Bank), and Sanwa (Sanwa Bank). For example, the Mitsubishi Group, a descendent from a prewar *zaibatsu*, is centered on the Mitsubishi Corporation (a trading company), Mitsubishi Bank, and Mitsubishi Heavy Industries. The affiliated Mitsubishi companies include 35 firms in insurance, construction, food, textiles, paper, chemicals, petroleum, glass, cement, steel, nonferrous metals, machinery, electronics, transportation machinery, optical instruments, shipping, real estate, and warehousing.[5] As a group, Mitsubishi's sales are about twice the level of those of General Motors, the world's largest industrial corporation.

******Figure on Japan's Industrial Groups about here**********

The vertically integrated groups include 39 blue chip manufacturers such as Nippon Steel, Toyota, and Matsushita Electric. These groups resemble the business empires found in all industrialized nations of the world.

CONGLOMERATE TIES

The six major *keiretsu* organized into conglomerates use a variety of methods to tie their enterprises together. These include:

- crossholdings of shares
- presidential councils
- intra-group financing by a common bank
- mutual appointments of officers
- use of trading companies for marketing and organizing projects
- joint investments in new industries.

The cross-holdings of shares in Japan stems from three factors. First, when the U.S. occupation authorities after World War II liquidated the Japanese holding companies and forced them to sell their stock, the major buyers with funds to purchase them were other companies. Second, as Japan liberalized its capital markets in the 1960s and 1970s, companies began to fear hostile takeovers from abroad. They protected themselves by having friendly companies serve as stable stockholders. Third, Japan's antimonopoly law proscribes holding companies. Hence, the cross-shareholding substitutes for vertical shareholding possible through holding company structures prevalent in other countries.

The extent of stock crossholdings among the conglomerate *keiretsu* ranges from about 14 to 22 percent of total paid-up capital. The purposes of the mutual holdings of stock include cementing relationships and precluding hostile takeover attempts. The holdings of stock are

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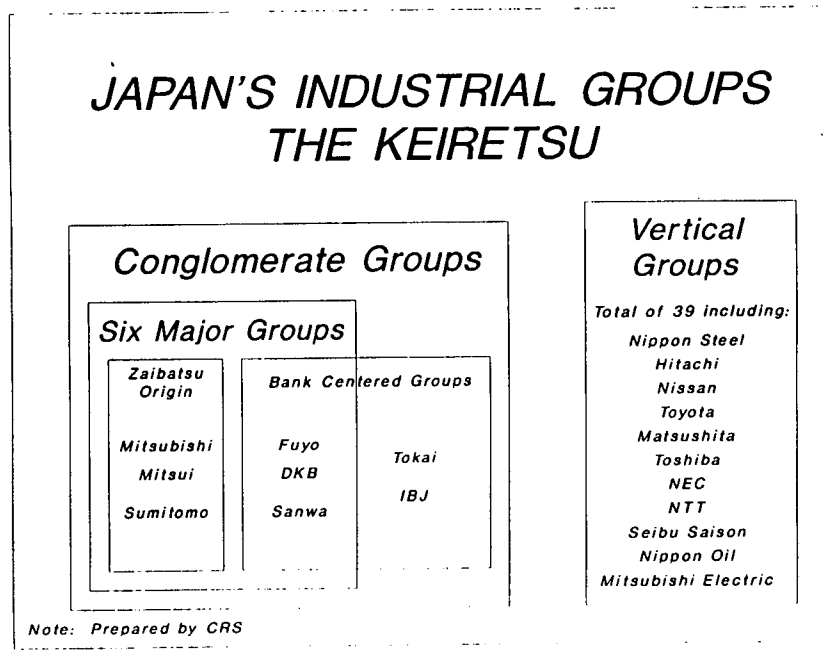
(continued) e.g., Chrysler's acquisition of American Motors.

[5] Dodwell Marketing Consultants. *Industrial Groupings in Japan*. 8th Ed. 1988/89. Tokyo, Dodwell, 1988. p. 47ff.

Figure 1.


JAPAN'S INDUSTRIAL GROUPS
THE KEIRETSU
Conglomerate Groups
Six Major Groups
Zaibatsu Origin
Mitsubishi
Mitsui
Sumitomo
Bank Centered Groups
Fuyo
DKB
Sanwa
Tokai
IBJ
Vertical Groups
Total of 39 including:
Nippon Steel
Hitachi
Nissan
Toyota
Matsushita
Toshiba
NEC
NTT
Seibu Saison
Nippon Oil
Mitsubishi Electric
Note: Prepared by CRS

rarely sold.[6] The mutual share holdings also reduce pressures on companies to increase short-term profits.

In the bank-centered *keiretsu*, the holding of shares by the bank in the group companies signifies a relationship that also is buttressed by other means. The companies exchange information with the bank and usually deposit large amounts of cash there just to maintain satisfactory relationships. They also, however, make such deposits with other banks, just to ensure that ample credit will be available during periods of tight money and .that no single bank will exert undue influence on the corporation.[7]

Given the debàte in the United States over the cost of capital for businesses, one question is whether or not the members of a bank-centered *keiretsu* are able to gain access to loans under preferential conditions. Even though interest rates might be the same for inside and outside borrowers with similar credit ratings, member firms probably have received preferential access to available funds during credit crunches. They also can receive favorable terms of repayment and extensions, if necessary. The bank may step in and provide management to a firm that is facing bankruptcy. At one time, *zaibatsu* banks were referred to as "organ" banks or an integral part of the organization.[8] The current surplus of capital in Japan and the ready availability of other sources of finance, however, indicates that the importance of this "captive" bank is diminishing. As long as cheaper sources of capital exist in world financial markets, firms will continue to diversify their borrowing away from their primary bank.

Under the postwar dissolution of the *zaibatsu* and subsequent laws, the *keiretsu* banks were forced to diversify their lending activities. Likewise, borrowing firms began to limit their loans from their primary banks to about 30 percent. Even bank-centered *keiretsu* companies, therefore, borrow from several other banks. However, ties still are strong. In the case of Nihon Dennetsu, a member of the Mitsui *keiretsu*, it had been obliged to consult with Mitsui prior to borrowing money outside the group.[9]

The presidential councils comprise the presidents of the leading companies of the group, who meet periodically (usually monthly) to discuss matters of mutual interest. The importance of these councils appears to be diminishing, since in the 1960s such councils met weekly. While the councils claim not to be policy making bodies for the group (as were the prewar holding companies), they do discuss such topics as economic and financial conditions, promising business activities, research and development, intra-group trademarks, and labor problems. They also can decide on joint investments in new industries, political contributions, public relations, rehabilitation of troubled member companies, and key personnel appointments.[10]

During the recent merger of Mitsubishi Metal and Mitsubishi Mining and Cement, Takeshi Nagano, President of Mitsubishi Metal, said that the merger was not discussed in the Presidential Council for fear of allegations of insider trading. Other *keiretsu* members were informed of the decision personally after the decision had been made.[11]

At the center of several conglomerate *keiretsu* are general trading companies.[12] These huge companies operate diverse businesses on their own while providing many services to

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[6] Since most companies carry these stocks at their historical value, many Japanese companies have balance sheets in which net worth is considered to be understated.

[7] Abegglen, James C., and George Stalk, Jr. *Kaisha, The Japanese Corporation*. New York, Basic Books, 1985. p. 165-166.

[8] Hadley, *Antitrust in Japan*, p. 157.

[9] Nihon Dennetsu Flies Free of Parent Mitsui. *The Japan Economic Journal*, June 2, 1990. p. 21.

[10] Dodwell, *Industrial Groupings*, p. 9.

[11] Thompson, Robert. Deriding the Conspiracy Theory. *Financial Times*, May 22, 1990. p. 24.

[12] General trading companies are referred to as *Sogo Shosha* in Japanese.

member firms. They procure raw materials, distribute products, finance some activities, organize diverse projects, and gather and disseminate intelligence. Since trading companies are involved in both importing and exporting, they can absorb considerable foreign exchange risk for the group. The trading company usually is considered to be the lead company or shares leadership with a bank or other major company in the group. Mitsui & Co. (the trading company), for example, shares leadership with Mitsui Bank, and Mitsui Real Estate Development in their *keiretsu*.

Trading companies, moreover, engage in transactions not only for Japanese firms, but also among buyers and sellers in third countries. Such transactions might include, for example, arranging for a sale of a U.S. chemical plant to the Soviet Union or importing Romanian urea into Bangladesh.[13] In the early 1980s, Japanese trading companies handled as much as 10 percent of all U.S. exports.[14] In 1987, the nine leading trading companies reported that 17 percent of their sales were exports from Japan, 19 percent were imports, 20 percent were third-country sales, and 44 percent were domestic sales.[15]

Japan's general trading companies enter into a variety of transactions. Each company will handle as many as 20,000 different products with numerous suppliers. This enables them to arrange multi-product deals that encompass many facets of a project. An example would be the export of a turnkey petrochemical plant to Singapore that required equipment, technology, and consulting services of many different firms.[16] About half of the sales of the nine leading trading companies were in metals and machinery. Other major categories were fuels, chemical products, foodstuffs, and textiles. In 1987, the top nine trading companies in Japan handled 74 percent of all Japan's imports, 42 percent of its exports, and carried even greater shares of certain products, such as steel and grain.[17]

General trading companies wield considerable market power. Through control of key ports and shipping facilities, they can exert pressure on member companies in their buying and selling decisions, and can hinder U.S. exports. Since such a high proportion of Japan's imports are concentrated in the hands of a few firms, moreover, the government is better able to exert "administrative guidance" to dampen imports of particular goods. This has happened in the past in steel and textiles.[18] Most of the imports handled by trading companies, however, are bulk commodities. Hence, they are less influential in either promoting or hindering imports of manufactured goods.

In terms of new business ventures, the *keiretsu* often form committees to study promising areas. Mitsubishi, for example, used a study committee to plan how the group would move more rapidly into advanced communications. Mitsui coordinated member company efforts in new media research, and Sumitomo in commercial uses of space.[19]

U.S. businesses have charged that the conglomerate *keiretsu* prefer to buy from other member companies rather than from outsiders, particularly foreign companies. While such intra-group buying appears to be declining, it still can be quite significant, particularly for capital goods. On average, intra-group purchases account for 10 to 20 percent of the purchases

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[13] Young, Alexander K. *The Sogo Shosha: Japan's Multinational Trading Companies*. Boulder, Colorado, Westview Press, 1979. p. 9–10.

[14] Yoshino, M.Y., and Thomas B. Lifson. *The Invisible Link, Japan's Sogo Shosha and the Organization of Trade*. Cambridge, Mass., The MIT Press, 1986. p. 2.

[15] Nihon Keizai Shimbun. *Japan Economic Almanac, 1988*. Tokyo, Nihon Keizai Shimbun, 1988. p. 226.

[16] Young, *Sogo Shosha*, p. 4–9.

[17] Keizai Koho Center. *Japan 1990*. Tokyo, Keizai Koho Center, 1989. p. 46.

[18] Lincoln, Edward J. *Japan's Unequal Trade*. Washington, Brookings Institution, 1990. p. 88.

[19] Prestowitz, Clyde V., Jr. *Trading Places*. New York, Basic Books, 1988. p. 159–160.

by *keiretsu* firms. In 1981, for the six largest firms in the distribution sector, the share of purchases from fellow *keiretsu* firms amounted to 3.1 percent for textiles and clothing, 0.5 percent for agricultural products, 9.9 percent for minerals, metal products, and chemicals, and 21.1 percent for machinery and equipment.[20]

In a 1985 survey of Japan's machinery manufacturers by Japan's Ministry of International Trade and Industry, 95.1 percent of the respondents said they would pick the superior good whether in-group or imported, while 2.0 percent favored in-group goods even if imports were superior, and 2.9 percent said they favor imports, even if in-group goods were superior. (This last group of respondents were all affiliates of foreign companies.)[21]

The three major U.S. complaints about Japanese conglomerate *keiretsu* are their intra-group trading, control over markets, and cross-shareholding which makes hostile takeovers extremely difficult. The conglomerate's trading companies, however, have been used by some exporters to facilitate exports to Japan. The conglomerates no doubt will continue to grow, but future growth will likely come at the expense of the traditional "family" ties. Individual companies in the conglomerates are likely to become more and more independent in the future as they develop their own marketing mechanisms and establish links with firms in other countries and industries.

Two major trends are developing in industries in the three developed markets of the world: North America, Europe, and Japan. The first trend is toward consortia of firms in a specific industry to link together to market products simultaneoulsy in all three markets. General Motors, for example, has ties with Isuzu and Suzuki in Japan and its subsidiaries in Europe.

The second major trend is for corporations to establish networks by which they link with other firms to share technology, jointly develop products, or cover markets. The recent agreement between Mitsubishi and Daimler-Benz conglomerates to cooperate over a wide range of business activities is one such example. The tie-up is expected to spawn joint projects in automobiles, electrical machinery, aerospace technology, and corporate telecommunications networks.[22] Hence, even the largest and most centralized of the conglomerate *keiretsu* is finding it necesary to network with the largest German conglomerate in order to remain competitive in world markets.

As long as markets continue to expand, intra-group trading as a percent of total trade will likely diminish. During a severe recession, however, conglomerate *keiretsu* could implode upon each other. They would likely support fellow conglomerate members in adverse business conditions.

The cross-shareholdings of stock also could diminish. Given the heights reached by the Tokyo stock exchange, some companies are questioning the value of keeping a portfolio with so many shares of other companies, when the value of those stocks has risen so much and those funds could be used for other purposes.

VERTICAL TIES

In addition to the *keiretsu* integrated into conglomerates discussed above, numerous vertically integrated groups exist in Japan. Some of these vertically integrated groups also maintain

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[20] Batzer, Erich, and Helmut Laumer. *Marketing Strategies and Distribution Channels for Foreign Companies in Japan*. Boulder, Westview Press, 1989. p. 111.

[21] Keizai Koho Center. *Trading with Japan*. Tokyo, Keizai Koho Center, 1985. p. 22.

[22] Smith, Charles. Two's Company. *Far Eastern Economic Review*, May 24, 1990. M'bishi, Daimler-Benz Mull 7 Joint Projects. *Mainichi Daily News*, May 24, 1990.

horizontal ties. These independent industrial groups resemble the corporate behemoths elsewhere in the industrialized world.

The groups usually are headed by one or more large industrial concerns and are commonly concentrated in one or a few industries. Normally, the affiliated firms maintain vertical buyer-supplier relationships, although ties with horizontal firms also are common. The Nissan Motor Corporation, for example, has links with Fuji Heavy Industries (makers of Subaru automobiles), but its primary relationships are with its twenty-two upstream suppliers of parts and downstream distribution-related companies, such as Nissan Motor Sales, Nissan Auto Transport, and Nissan Motorist Service. Hence, the relationships go both down the supply chain from manufacturer to raw material provider or component maker and up the distribution system through the wholesaler and retailer.

There are no strict criteria for distinguishing a vertically integrated *keiretsu* from other large vertical groupings. Dodwell Consultants lists as *keiretsu* 39 vertically integrated groups whose sales exceeded one trillion yen in 1987. The list includes companies whose brand names boast world-wide recognition: Toyota, Nissan, Honda, Mazda, Sony, Mitsubishi Electric, Hitachi, Toshiba, NEC, Nippon Steel, NTT, and Sharp. Some of the vertically integrated groups also are members of conglomerate *keiretsu*.[23]

As with the conglomerate *keiretsu*, vertical *keiretsu* firms hold each other's shares, exchange information, and cooperate in new ventures. Since the relationship is vertical, however, the closest ties are between buyers and suppliers or between maker and distributor in the group. Under Toyota Motor, for example, stand 22 firms making auto parts or assembling sister products (such as looms). These include Toyota Auto Body, Toyoda Automatic Loom Works, Aichi Steel Works, and Koito Manufacturing. Toyota also owns dealerships, an insurance company, and three ventures in non-automotive fields. This is similar to General Motors or Ford.

The distinguishing feature of the vertical links in Japan (and one that U.S. firms also are adopting) is the close relationship between the parent company and its suppliers. Such links tend to pervade all Japanese businesses, but are the strongest within the *keiretsu*. Relationships that initially are forged by the mutual buying of each other's stock are expected to continue for a long time. The supplier participates actively with the final manufacturer in designing products, upgrading technology and manufacturing processes, and implementing quality control. The buyer usually is allowed to examine the supplier's books, and cost savings generally are passed on to the final manufacturer to be incorporated into the retail price of the product. The supplier is an integral link in the competitive strategy of a Japanese manufacturer.

The close links also substitute for legal work in Japan. Supplier-buyer contracts often do not contain the detailed contingency clauses common in American contracts. If a problem arises, the relationship of mutual trust allows the companies to work out a satisfactory solution. The long-term nature of the relationship, moreover, means that if one side has to take a loss because of unforeseen difficulties, it may be favored the next time a problem arises. Hence, equity can be attained.

The traditional Japanese system of permanent employment reinforces the vertical *keiretsu* system. Although permanent employment covers only the core employees of a company and only about a third of the total work force, it usually is standard in the *keiretsu* companies. Under permanent employment, new hires are kept on the job until they retire (at age 55 to 60), and their salary rises with their years of service.

The problem with permanent employment is that every company has an organizational structure shaped like a pyramid. Every person hired cannot be promoted continually. Not enough jobs exist in management. The company can solve the problem by growing fast enough

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[23] Dodwell Consultants, *Industrial Groupings*, p. 141.

to create new managerial jobs as the permanent employees rise in the organization, but eventually every company runs out of positions, even for highly capable individuals.

It is in solving this employment problem that subsidiaries and suppliers in the *keiretsu* play a critical role. The subsidiaries and suppliers usually are required to accept retiring (voluntary or forced) employees from the lead manufacturer. This also helps the supplier, since the retiree usually turns around and deals with people in the parent company whom he formerly supervised. Such personnel transfers add to the difficulty of an outsider firm to break into a *keiretsu* buyer-supplier relationship.

Japanese manufacturers also do not change suppliers without first consulting existing ones. If a competing supplier comes in with a lower price or new product, the existing supplier often is given a chance to match it. U.S. automotive parts suppliers, in particular, have complained that they cannot even get specifications for parts from Japanese automakers. They are told that they have to enter the process earlier. The existing suppliers have already been involved in developing those specifications and manufacturing processes.

A supplier also will supply parts under a contract that will have provisions for falling prices, zero defects, and just-in-time delivery. The philosophy of Japanese contracting is that as a company moves out on the experience curve for a given product, the price of that product should fall. Also, manufacturers often require their suppliers to insure that their products are 100 percent defect-free. Such parts can be delivered directly to the manufacturer's assembly line and not reinspected or stored. Parts also must be delivered as they are needed on the assemby line. This just-in-time delivery means that the supplier may be required to make several small-lot deliveries at specific times each day.

Such exacting requirements on the supplier mean that the buyer and supplier must have a relationship that goes beyond that specified in the contract. There must be trust, loyalty, a mode of operation that allows for problems to be worked out in a mutually satisfactory manner, enough confidence in the relationship that the supplier is willing to invest in new technology, and a sharing of production and cost data that normally might be considered proprietary. Such relationships are difficult to cultivate without closer ties than those developed through arms-length transactions. Hence, in Japan vertical *keiretsu* have developed.

The complaints of outsiders, not just foreigners but including Japanese companies who are not members of the privileged few suppliers, is that breaking into existing buyer-supplier relationships is nearly impossible. The best chance for an outside company to break into the existing buyer-supplier chain is with a unique product. Even a unique component, however, will usually be incorporated into a new, not existing, product. The buying firm will maintain its links with the existing suppliers.[24] Rarely can a new firm break in on the basis of price alone.

The size of the *keiretsu*, moreover, makes it easier for the lead companies to establish cartels and divide up markets or exclude outsiders.

Distribution *Keiretsu*

Vertical *keiretsu* also extend from the manufacturer through distributors and even to retailers. Much like automobile dealership franchises, some Japanese makers maintain exclusive wholesale and retail networks. These are common in automobiles, electrical appliances, cosmetics, confectioneries, and musical instruments. Discipline is maintained in the distribution system through providing capital and rebates. Capital is usually supplied by purchasing large blocks of the wholesaler's stock, holding promissory notes while goods are moved, and other

[24] Batzer and Laumer, *Marketing Strategies*, p. 103.

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forms of trade credit.[25] Rebates also are provided both to increase profit margins and as sales promotions.[26]

Matsushita Electric Industrial Company, the maker of National and Panasonic brand name products, for example, maintains its 25 percent share of Japan's domestic refrigerator market through 24,000 "National" shops which sell its brand-name products. More than half of Matsushita's home appliance products are still sold through such shops. Similarly, 11,000 shops belong to the Toshiba *keiretsu*, 9,000 to Hitachi, 5,000 each for Sanyo and Sharp, and 3,000 for Sony.[27]

In 1990, Matsushita indicated that in response to U.S. pressures it intends to overhaul its *keiretsu* distribution system for home electrical appliances. The company will abolish special rebates for companies that sell a large volume of its products and revise the system by which retailers could make a deposit with Matsushita worth 1 percent of their transactions with the company and receive returns at the same rate as Matsushita stocks (about 20 percent currently). Matsushita also indicated that it would revise its use of officially suggested retail prices.[28]

Japan's antimonopoly law has provisions aimed at most monopoly practices in distributing products from the manufacturer to the customer. Resale price maintenance, exclusive dealing stipulations, and customer restrictions seem to be disallowed in the law, but the sanctions are so weak that the law appears to have little effect. When successful antitrust proceedings are brought against a company, the result is usually a cease and desist order rather than a penalty.[29]

In Japan, vertical restraints generally are treated as unfair business practices rather than as private monopolizations. In 1982, Japan's Fair Trade Commission (JFTC) designated practices it considered to be unfair. These included unjust exclusive dealing, unjust resale price maintenance, and unjust customer relations. Actual examples from the files of the JFTC include firms that stipulated minimum retail prices or maximum wholesale prices, prohibited firms from upsetting a discriminatory price structure, assigned exclusive territories, or required salesmen to deal exclusively in their products. Each of these cases can be explained by standard economic arguments common in the United States and other industrialized countries and not unique to Japanese culture, custom or tradition.[30]

One allegation made by several U.S. competitors is that Japan's *keiretsu* distribution system allows Japanese companies to generate large profits at home and then use those profits to cover their fixed costs and to charge prices close to variable costs or even less than variable cost in export markets. In theory, such behavior can lead to the dumping of products abroad, particularly when excess production capacity exists in Japan.[31]

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[25] Yamamura, Kozo, and Jan Vandenberg. Japan's Rapid-Growth Policy on Trial: The Television Case. In: Saxonhouse, Gary R., and Kozo Yamamura, eds. *Law and Trade Issues of the Japanese Economy*. Seattle, University of Washington Press, 1986. p. 243-244.

[26] Dodwell Marketing Consultants. *Retail Distribution in Japan*. Tokyo, Dodwell Marketing Consultants, 1988. p. 80.

[27] Sekiguchi, Waichi. Electronics Firms Aim to Keep Keiretsu. *The Japan Economic Journal*, June 2, 1990. p. 3.

[28] Matsushita to Overhaul '*Keiretsu*' Practices. Nikkei Top Articles by *Nihon Keizai Shimbun*, April 22, 1990.

[29] Flath, David. Vertical Restraints in Japan. *Japan and the World Economy*, v. 1, 1989. p. 187.

[30] Flath, Vertical Restraints, p. 202.

[31] Most recent antidumping cases against Japan deal with industrial materials or products not sold in Japan through a *keiretsu* distribution system.

The philosophy of many Japanese firms is that a loss can be taken in developing new markets if the potential for long-term profits is high enough. Toyota, for example, took years before it began to turn a profit in the U.S. market. The *keiretsu* distribution system in Japan tends to support such market behavior abroad.

Any change in Japan's vertical *keiretsu* is likely to be marginal and in response to economic as well as political pressures. As Japan's distribution system is modernized, however, the single brand stores are likely to lose business to the large-scale marketers. In the case of cameras, the discounters, such as Yodobashi Camera in Tokyo, sell in such volume that Japan's camera makers have been forced to deal with them. In the process, the camera makers have lost much of their control over prices. The loosening of import restrictions, moreover, means that Japanese firms will no longer be able to charge higher prices domestically, thereby, fattening their profit margins at home in order to shave them abroad.

THE JAPAN FAIR TRADE COMMISSION

The Japan Fair Trade Commission (JFTC) was created by the U.S. Occupation authorities in 1947 (based on the American model) and serves as Japan's watchdog agency dealing with antitrust laws. Under the antimonopoly law established at the same time, and as elaborated in a 1953 notification by the JFTC, the six categories of business practices considered to be unfair include boycotts and refusals to deal; discrimination in prices, terms, or access to concerted activities; unreasonably high or low prices; exclusive dealing; vertical restrictive agreements including tying and (generally) resale price maintenance, and abuse of a dominant bargaining position.[32]

The JFTC uses summary investigation procedures when a violation is not substantial or is limited in scope. In formal investigations with sufficient evidence of a violation, the JFTC will take formal action. Where the evidence is insufficient, the commission usually issues a warning to eliminate the activities in question. Only in exceptional cases will the JFTC file a criminal accusation against a company; the most recent example was against a 1974 oil cartel.[33]

In total, the JFTC handles as many as 500 cases per year. Not all, of course, involve the *keiretsu*. In 1975 and in 1976, it found more than 30 violations of the antimonopoly law (mostly price-fixing agreements). After that, however, violations averaged only about 11 per year, and, in 1986 and 1987, dropped to about 5 per year.

The 1977 revision of Japan's Antimonopoly Law allows the JFTC to assess surcharges against violators. The surcharges are based on the sales volume by the firms during the period of violation. The following table shows how the surcharges have varied.[34]

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[32] Caves, Richard, and Masu Uekusa. Industrial Organization. In: Patrick, Hugh, and Henry Rosovsky. *Asia's New Giant*. Washington, The Brookings Institution, 1976. p. 485–486.

[33] Hiroshi, Iyori. Antitrust and Industrial Policy in Japan: Competition and Cooperation. In: Saxonhouse and Yamamura, *Law and Trade Issues of the Japanese Economy*, p. 65–66.

[34] Ostrom, Douglas. Japan's Competition Policies. *JEI Report*, no. 20A, May 19, 1989. p. 9.

TABLE 1. Surcharges for Illegal Cartels in Japan, 1981–1987

Japanese Fiscal Year	Number of Cases	No. of Firms and Individuals	Amount (¥ millions)
1981	6	149	¥3,759.5
1982	8	170	737.4
1983	10	92	1,466.0
1984	2	5	353.1
1985	4	32	153.7
1986	4	32	275.5
1987	6	54	147.6
Total	58	877	¥9,797.9

Source: Japan Fair Trade Commission

In the mid-1980s, therefore, both the number of violations and the amount of the surcharges declined. Whether this was because of a greater awareness of the antitrust guidelines by businesses or because of more lax enforcement is not possible to determine.

Since then, however, the JFTC seems to have become more aggressive. In December 1988, it levied a surcharge of 290 million yen ($2.04 million) on 70 firms for conspiring to fix bids for projects at the U.S. Navy base at Yokosuka. It also punished construction companies for similar activities at the Osaka airport project, and issued a written warning to 36 firms suspected of forming a cartel to import beef.[35]

The contention of the United States is that the JFTC is underbudgeted, understaffed, and lacks enough clout to prevent abuses of monopoly power. The JFTC's staff and budget are about one-quarter the level of the combined U.S. antimonopoly force. The JFTC is one of the weakest agencies in the Japanese government. The chairman of its five-man commission usually comes from the Ministry of Finance, and MITI always has a representative there. Neither agency is a strong supporter of antitrust enforcement.

The United States also has pointed out the disincentives for private companies or groups to file antitrust suits in Japan.[36] Such suits are permitted, but they are rare and financial settlements are modest. During the oil crisis in 1973-74, for example, two consumer groups alleged that the oil companies were overcharging them. They eventually settled for the sums of $985 and $577 after the cases reached the Tokyo High Court. In another case, the consumers rejected a proposed settlement of $1,808, but went on to lose the case on appeal to the Supreme Court.[37]

In the Interim Report by the Japanese Delegation to the Japan-U.S. Structural Impediments Initiative (April 5, 1990), the Japanese government indicated that it intended to strengthen the JFTC and have it enforce the antimonopoly law more strictly. The JFTC is to monitor the transactions among *keiretsu* firms to determine whether or not they are being conducted in a manner that impedes fair competition.

The JFTC, with the assistance of an advisory group, is also to establish guidelines to insure that transactions among companies in *keiretsu* groups do not discriminate against foreign

[35] Holloway, Nigel. Freeing the Watchdog. *Far Eastern Economic Review*, October 19, 1989. p. 48.

[36] Anti-monopoly Law Revision Urged. *The Japan Economic Journal*, February 17, 1990. p. 12.

[37] Ostrom, Competition Policies, p. 10.

firms. Furthermore, the JFTC is to publish biennial analyses of the *keiretsu* groups including supplier-customer transactions, financing arrangements, personal ties, and the role of trading companies in the groups.

The issue of the *keiretsu* has also reached the U.S. operations of Japanese companies. The U.S. Federal Trade Commission has begun a probe of Japanese companies and their parts suppliers operating in the United States. The investigation is to determine whether or not their propensity to buy components from suppliers in which they hold a financial interest illegally discriminates against competing parts makers.[38]

IMPLICATIONS FOR U.S. POLICY

The *keiretsu* are a fact of life in Japan and are not likely to change significantly in the near future. Over time, however, all such arrangements tend to weaken because member companies grow so large that company policies become difficult to enforce, subsidiaries become financially independent, and the product lines of member firms become so complicated that the parent company can no longer provide meaningful guidance for them. Obviously, however, U.S. firms attempting to enter the Japanese market cannot wait for this process to develop.

To say that Japan's *keiretsu* exist is not to say that competition in Japan is bridled. Among the *keiretsu* companies, competition is ferocious. Companies compete, however, more in product quality and new features, rather than just price. The ferocity of this competition is attested to by the speed of technological innovation and the rapid decline in the cost of production in Japan's manufacturing sector. This makes the *keiretsu* different from government-sanctioned monopolies or other such uncompetitive (and anticompetitive) entities in other nations. Since competition is so fierce, Japan's *keiretsu* companies tend to keep up with world developments in technology, manufacturing processes, and product development.

On a practical level, U.S. firms assessing potential customers in Japan should first look at existing *keiretsu* links. They should examine the number of employees received by suppliers from the buying company and the positions they occupy, the crossholdings of stock, and the nature of the buyer-supplier relationships already in place. Once the U.S. firm has gauged the extent of the *keiretsu* ties, it has several options.

First, the U.S. firm can focus on those buyers without *keiretsu* ties. These usually will be smaller firms often located outside of Tokyo or they may be entrepreneurial firms such as Sony or Honda. While the entrepreneurial firms may be vertical *keiretsu* themselves, they often are more open to outside products because they have had to battle the entrenched conglomerate *keiretsu* from their inception. Taiwanese exporters pursued this strategy. They began by establishing contacts in second-tier cities such as Osaka and Fukuoka. There, they found companies whose major problem also was trying to compete with the *keiretsu* firms and who were searching for new products that might give them an advantage.

Second, the U.S. firm can attempt to link up with a supplier who is already a member of the *keiretsu* or its supply network. U.S. companies such as Borg Warner and Honeywell have followed this strategy by forming joint ventures or licensing local production. This avenue can achieve short-term results, but it has the long-term danger that the Japanese partner could adopt the technology and improve upon the U.S. firm's product so much that it becomes independent and takes over the market by itself.[39]

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[38] Trade. *Business Week*, June 4, 1990. p. 71.

[39] See, for example: Reich, Robert B., and Eric D. Mankin. Joint Ventures with Japan Give Away our Future. *Harvard Business Review*, v. 64, March-April 1986. p. 78–86.

A typical joint venture might result in 20 Japanese engineers sent to the U.S. parent company to learn about the American technology and one American engineer sent to Tokyo to help the Japanese partner adopt it. Nowhere in the process are American engineers sent to Tokyo to learn about Japanese technology.

In terms of distribution, a U.S. firm might link up with either a similar company or one in a different sector but servicing the same clientele. Sales of Tiffany products by Mitsukoshi department stores, for example, reached $26 million by 1988.[40] Honda is starting to distribute Chrysler Jeeps in Japan, and Diner's Club worked with Japan Travel Bureau as its partner at an early stage.

Third, the U.S. firm might establish a relationship with some other part of the buying company. One method is for the American company's engineers to provide the engineering staff in the *keiretsu* company with technical help on an informal basis. This bypasses the purchasing department entirely. After the Japanese engineers begin to feel indebted to the U.S. company's engineers and see how the U.S. product might solve their problems, the U.S. company's engineers then suggest that the Japanese engineers ask their purchasing people to buy the U.S. product. This is a tactic that has been used successfully by European machine tool makers.[41]

A similar strategy is to begin working with the potential buyer long before the buying decisions are made. In May 1990, for example, the Nippon Telegraph and Telephone Corporation announced that AT&T International, Motorola, and Ericsson of Sweden had been selected, along with seven Japanese companies, to develop its next generation mobile-telephone system. When the actual purchases are made, these foreign companies should be able to compete equally with Japanese companies because they will have been in the market from the beginning. Similar opportunities are available for U.S. semiconductor suppliers for high-definition TV.[42]

Fourth, if the U.S. firm has deep pockets, it can establish its own subsidiaries and distribution system and confront the *keiretsu* on their home turf. This has been the route followed by companies such as IBM and Coca-Cola.

If U.S. firms perceive that the *keiretsu* system is working to block their sales in Japan, pressures can be brought to bear on the system by the U.S. Government. One of the problems, however, is that U.S. firms with complaints often are afraid to bring them to light for fear of jeopardizing their existing market in Japan. Occasionally egregious cases, such as soda ash[43] or amorphous metals, will come to light, but alleged violations often go unreported if the risks of complaining are greater than the probable gains.

The United States has not argued that long-term, *keiretsu*-type relationships that make economic sense are wrong. Indeed, relationships based on trust that reduce the need for legal work enhance the efficiency of producers. The existence of *keiretsu*, per se, is not the problem. The problem is that the close coordination among group members facilitates violations of antitrust laws and dealings that can exclude U.S. exporters.

In terms of reciprocity and equity, moreover, the ease with which Japanese companies can buy into U.S. firms compared with the difficulty of U.S. firms to do likewise in Japan offends the sense of fairness of many Americans.

U.S. pressures on the system through the SII and other fora are likely to speed up the process of liberalization and can restore some of the power of the JFTC to pursue abuses among *keiretsu* companies. The U.S. demands that the JFTC be strengthened are also supported

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[40] Mitsukoshi Increases Share in Tiffany. *Business Tokyo*, v. 3, November 1989. p. 52.

[41] This was explained in a briefing by Dirk Vaubel, President of Vaubel & Partners, Ltd., Tokyo, Japan, in March 1990.

[42] Schlesinger, Jacob M. Japan's NTT Loosens Its 'Family' Ties. *The Wall Street Journal*, May 21, 1990. p. A8.

[43] Prestowitz, *Trading Places*, p. 162–163.

by the JFTC. During the SII talks, the U.S. Embassy in Japan kept in close contact with the JFTC to insure that the U.S. demands were reasonable. After the SII talks are complete, oversight and monitoring will be important.

The fastest changes in the *keiretsu* system are likely to occur in distribution. The economic rationale for the vertical buyer-supplier relationships is so strong, that such *keiretsu* are unlikely to change much. The conglomerate *keiretsu* are likely to grow rather than to shrink, although coordination among member companies is likely to diminish as individual companies become more independent and networking outside the *keiretsu* system becomes more common.

Recently, in Washington, D.C., Akio Morita, the Chairman of the Sony Corporation, was asked what he thought about the *keiretsu* (referring to the mammoth conglomerate *keiretsu*). His reply was that every firm would like to have a guaranteed market for some of its output. Someday, he would like Sony itself to develop into a *keiretsu*.[44] This seems to be the attitude of most of Japanese big business.

Japan's Keidanren (Federation of Economic Organizations), a powerful voice representing big business, favors a review of Japan's competition policy and some increased enforcement of the antimonopoly law. It points out, however, that if the law were to be revised without also changing the statutory waivers from applications of the law for selected industries, inequities would develop. They favor establishing the rule of "free in principle, subject to regulation only in exceptional circumstances" and more transparency in administering the law and applying regulatory guidelines. They agree with the United States that governmental administrative guidance should be given in writing, and not just orally.[45]

Keidanren, however, comprises nearly all the *keiretsu* companies in Japan. While it favors a stronger JFTC, it still considers the *keiretsu*, in general, to be a strength of Japan. Stronger antimonopoly enforcement, therefore, is not likely to lead to a demise of the *keiretsu*.

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[44] Address before the Center for Strategic and International Studies' Congressional Staff Working Group, June 5, 1990. Washington, D.C.

[45] Keidanren (Japan Federation of Economic Organizations). *Keidanren Position Paper on the Structural Impediments Initiative (SII) Talks*. March 13, 1990. Tokyo, Keidanren. p. 5.

Senator BINGAMAN. Thank you very much.

Before we go to any questions, let's hear from the other witnesses here.

Ms. Genther, why don't you go right ahead?

STATEMENT OF PHYLLIS GENTHER, DIRECTOR, JAPAN TECHNOLOGY PROGRAM, OFFICE OF TECHNOLOGY POLICY, U.S. DEPARTMENT OF COMMERCE

Ms. GENTHER. Senator, I welcome the opportunity to testify on Japan's government/business relationship. I am testifying today as a student of the Japanese economy, not as an official of the U.S. Department of Commerce.

It's important to understand why and how Japan's government officials and its business community interact if we are to develop an effective response to cope with Japan's economic challenge.

In addition, I feel it is at least equally important to understand how our own perceptions affect how we analyze Japan's government/business relationship.

Today, I would like to stress how the analyses by those who discuss government/business relations as an aspect of United States-Japan relations contribute to our understanding of these interactions and then briefly touch upon a framework which I think we can use to understand the primary factors that have shaped Japanese government/business interactions and continue to shape them.

First, our differing perceptions of the role of government/business interactions are rooted in the way we analyze the nature and role of the international, American and Japanese economies. These analyses provide the foundation for which we can explore complex interactions.

American policymakers have traditionally paid little attention to how interactions between government and business within countries affect global economic competition or to how the international economy in turn affects such interactions.

There has also been little recognition that such interactions change over time or of the factors that lead to change.

When attention did turn to these interactions as part of the industrial policy debate in the early 1980s, a conceptual problem arose that still exists.

Many scholars are unable to separate their study of government/business relationships in global competition from the preferences concerning the role of government in the American economy. Many studies seek proof of existing preferences rather than looking at how and why interactions occurred in Japan at different periods of time.

In order to help simplify some of these concepts and help us understand Japanese government/business interactions, we need to look briefly at three different schools of thought.

The first views the relationship as a reflection of cultural and historical factors.

The second group concentrates on the concept of industrial policy and the role that government plays in economic growth.

The third looks at government/business relationships in Japan as an interactive partnership.

The first group, cultural and historical factors. Studies in this group describe the relationship as the missing element that explains Japan's post-War economic performance. They stress the special and unique way in which the Japanese government guided the economy's development, a way that they feel was strongly influenced by Japan's culture and history.

Historically, this group thinks that it is the close communication between the government and the business community that has existed since the Meiji era. That is one of the most important elements to look at; because Japan was forced to open its market, it had to design policies to achieve the rapid and forced growth of industry to avoid being partitioned like China.

Thus, the unique relationship between government and business, a special coalition, grew out of the Meiji government's attempts to foster modern industry through various subsidies.

The cultural elements cited in the study stem from Confucianism and native traditions. They are often behind references to consensual decision-making or the group spirit.

In the context of government/business relations, this view implies that Japanese leaders are conditioned by their culture to preserve harmony in their relations. It also implies, for example, in terms of the keiretsu, that horizontal business mergers are difficult to achieve because they go against predispositions toward vertical relationships.

I think that this group of studies provides only a partial insight into government/business interactions. Policymakers are, to some extent, guided by cultural norms and historical experiences. This factor offers insight into such practices as the formation of coalitions. They provide policymakers with historical lessons and remind us that culture affects how we perceive events and concepts.

But, if cultural and historical contexts are the primary shapers of the government/business relationship, I would expect the relationship to change quite slowly and we would be able to explain all current behavior as some extension of some previous pattern.

These patterns, however, are often over-ridden by other considerations. The second perspective that people write from is the industrial policy perspective. This examines the government/business relationship within the context of industrial policy and the role of government policy in economic development.

It asks whether government or business is primarily responsible for Japan's rapid economic development. It includes two approaches. One supports the supremacy of the State, the other the importance of markets.

The Statist approach often represents political institutions, such as the Ministry of International Trade and Industry, as the primary determinants of the relationship.

Proponents of this view attribute a large role to the State in economic development and see a world in which bureaucrats wield exceptional power and influence.

Some want the United States to learn from the Japanese government and perceive success in facilitating development. Others use

this concept as justification for an activist U.S. policy to offset effects on global competition caused by the intervention of the Japanese State.

Political institutions can predispose a relationship to be cooperative or adversarial and can place constraints on business actions. As such, they offer insights into how government perceives and attempts to carry out its role in economic development.

For example, many Japanese bureaucrats still perceive their role in promoting industrial development as a method to maintain control of the home market. However, this group of studies often fail to pay sufficient attention to the actions and initiatives of the private sector. And so fail to account fully for variations in government/business relationships across industrial sectors and for instances in which public policies fail.

Advocates of the market approach often depict political institutions as playing only a small role in promoting economic development. Their studies correctly point out the existence of a strong private sector and the developmental effects of competition within Japan. They stress that Japan's economic development resulted from a free market typified by intense competition and successful entrepreneurs and cite instances where the Japanese government failed to impose its ideas on business.

In this context, the only legitimate government role is the creation of a macroeconomic environment conducive to business and the imposition of regulations to achieve social goals.

However, in their attempt to demonstrate the supremacy of the private sector, they discount the role of States and, thus, the importance of government/business interactions in shaping economic development.

This assumptions hinders the study of government business relations by imposing an ideal in which there is as little interaction as possible.

The third and final perspective, I call the interaction perspective, looks at interactions between government and business over a period of time. These studies recognize interaction between economic actors and government and record instances of political conflict and compromise.

Studies using an interaction perspective record instances of government and private initiatives that result in market transformations. But, they try not to presuppose the supremacy of the State or of the market. They rely heavily on a detailed knowledge of interest group interactions within specific industries. They propose no monolithic government or business exists; rather, there are many players and levels of interactions because a detailed knowledge of each industry is necessary. These studies are sometimes dismissed as presenting concepts that are unique to a specific industry and not transferrable to other sectors or to economic development in general.

They do, however, delineate domestic and international factors that place constraints on or encourage interaction. And interactions are what create policy. They recognize that no single factor such as culture or the market can fully explain either the interactions themselves or economic development.

They also imply that changing circumstances can alter both the interactions themselves and the role of individual factors in determining outcomes. Thus, I believe that the interaction perspective provides the best, although not perhaps the easiest, framework within which to analyze government/business interactions.

I think this framework will also become increasingly useful in terms of current high-technology industries in Japan because there is more and more pressure from the international environment to shape what happens.

I'd like briefly to set up a framework within which I think government/business interactions can be discussed.

First, you have to start with the premise that interactions are complex and that they vary considerably, depending on the situation. But, at the same time, there are elements of continuity. Interactions reveal that no monolithic government or private sector controls the relationship; rather that many actors shape it, including Japanese government agencies, Japanese and foreign companies, foreign governments, multi-lateral organizations and individuals.

Most importantly, each of these actors can precipitate interactions that result in public policies. Understanding that government/business relationships are complex interactions and contain elements of continuity and change is not sufficient to comprehend the ramifications of these relationships in global competition. The framework must include the factors that shape the relationship.

The primary factors that I believe shape the government relationship are, first, cultural and historical relationships that influence the behavior and decisions of policymakers.

Second, administrative rules, which are the perimeters or government rules, agreed to by consensus or imposed by force in which the government makes and carries out policy.

Third, the competitiveness of an individual industry.

And, fourth, the importance, real or perceived, of an industry to economic development.

Each of these factors affects the relationship by creating tendencies towards continuity or change and by interacting with one another to create a dynamic environment. The potential effect of each factor must be carefully evaluated in relation to the others to discover how it affects any particular situation.

In the article which I did for the Joint Economic Committee Study, I used the auto industry as an example, but I believe these four factors can be taken and applied to any industry, either past or current.

In general, cultural and historical lessons have been especially important. First, government and business accept that each plays a role in policy formation. Both suggest policy initiatives, although the government drafts the actual policies.

Each side's acceptance of the other's role creates a tendency to formulate policy through negotiation. Government and business are also aware of the close association between the international environment and competitiveness. The awareness of this connection creates a sense of urgency and provides an incentive to work together.

Continuity does not mean that the Japanese government and business always cooperate and agree. Quite often, they do not. Con-

tinuity does not prevent change because the factors that create change override it.

Industry's competitiveness and, thus, its ability to oppose and shape government policy initiatives changes; the auto industry, for example, in opposing and working with the voluntary export restraints, had much more control over its destiny than it did in the 1950s when it was trying to import technology.

The rules of the international environment, such as the negotiations of new GATT protocols and, thus, the government's ability to enforce policies or even pursue certain policies changes. Again, for example, the Japanese government could no longer control business by allocating foreign exchange.

As an industry's importance to the economy changes, it alters the types of policies that are needed. As I said, you can take these four factors and apply them to specific industries. We have automobiles, biotechnology and semi-conductors. And to understand how the government/business relationship with that industry operates now on how it might develop.

Up until now, the result of the interaction of these four factors in most industries has been a Japanese government/business relationship that is dynamic and effective. Its effectiveness grew out of its interactiveness and out of the way in which various factors affected each other during particular periods of time.

In the 1990s, some of the factors affecting the Japanese government/business relationship will change. The elements of continuity remain, but the competitiveness of the Japanese economy and the international environment change; if there is a change in the ruling party, administrative rules might change.

In addition, interest is beginning to increase in policies that stress the achievement of broader social roles, such as better living standards for consumers. MITI's recently released vision for the 1990s stresses a need for human-oriented international trade and industrial policies rather than the past emphasis simply on manufacturing policies.

The existence of strong, competitive Japanese multinationals and the increase in total strategic alliances will undoubtedly have an impact. It's too early to predict whether the relationship's dynamism will remain and whether the acceptance of negotiation in policymaking will remain as strong.

[The prepared statement of Dr. Phyllis A. Genther follows:]

PREPARED STATEMENT OF DR. PHYLLIS A. GENTHER

JAPAN'S GOVERNMENT-BUSINESS RELATIONSHIP

Mr. Chairman, I welcome the opportunity to testify on Japan's government-business relationship. I am testifying today as a student of the Japanese economy, not as an official of the U.S. Department of Commerce.

It is important to understand why and how Japan's government officials and its business community interact in order to develop coherent and effective policies to cope with Japan's economic challenge. In addition, it is at least equally important to understand how our own perceptions affect how we analyze Japan's government-business relationship.

Today, I would like to stress how analyses by those who discuss government-business relations as an aspect of U.S.-Japan relations contribute to our understanding of these interactions, and then briefly touch upon a framework which can be used to understand the primary factors that shape Japanese government-business interactions.

Perspectives on Government-Business Relationships

Our differing perceptions about the role of government-business interactions are rooted in the way we analyze the nature and role of the international, American, and Japanese economies. These analyses provide the foundation from which to explore the complex interaction of Japan's government and industry.

Policy makers traditionally have paid little attention to how interactions between government and business within countries affect global economic competition or to how the international economy in turn affect such interactions. There also has been little recognition that such interactions change over time or of the factors that lead to change.

When attention did turn to these interactions as part of the industrial policy debate in the early 1980s, a conceptual problem arose. Many scholars were unable to separate their study of government-business relationships in global competition from their preferences concerning the role of the government in the American economy. Many studies sought proof of existing preferences rather than looking at how and why interactions occurred in Japan at different times.

For the purpose of examining and simplifying concepts that will help us understand Japanese government-business interactions, we need to examine three basic schools of thought. The first group views the relationship as a reflection of cultural and historical factors. The second group concentrates on the concept of industrial policy and the role government plays in economic growth. The third group looks at Japanese government-business relationships as an interactive partnership.

1. Cultural and Historical Factors

Studies in the first group describe the relationship as the "missing element" that explains Japan's postwar economic performance. They stress the "special and unique way in which the Japanese government guides the economy's development," a way influenced by Japan's culture and history.

Historically, this group thinks it is the close communication between government and the business community that these writers believe has existed since the Meiji era that is one of the most important elements in Japanese government-business relations. Because Japan was forced to open its market, it had to design policies to achieve the rapid and forced growth of industry to avoid being partitioned like China. Thus, the unique relationship between the government and business—a special coalition—grew out of the Meiji government's attempts to foster modern industry through various subsidies.

The cultural elements stem from Confucianism and native traditions. They often are behind references to "consensual decision making" or the "group spirit." In the context of government-business relations, this view implies that Japanese leaders are conditioned by their culture to preserve harmony in their relations. It also implies, for example, that horizontal business mergers are difficult to achieve because they go against cultural predispositions toward vertical relationships and group cohesiveness.

This group of studies provide only a partial insight into government-business interactions as a trade issue. Policy makers are to some extent guided by cultural norms and historical experiences. These factors offer insights into such practices as the formation of coalitions, provide policy makers with historical lessons, and remind us that culture can affect how events and concepts are perceived. But, if cultural and historical contexts are the primary shapers of the government-business relationship, we would expect the relationship to change quite slowly and we would be able to explain all current behavior as extensions of some previous pattern. These patterns, however, are often overridden by other considerations.

2. Industrial Policy Perspective

The industrial policy perspective examines the government-business relationship within the context of industrial policy and the role of government policy in economic development. It asks whether government or business is primarily responsible for Japan's rapid economic development. It includes two approaches; one supports the supremacy of the state, the other the important of markets.

The statist approach often presents political institutions, such as the Ministry of International Trade and Industry (MITI), as the primary determinants of the government-business relationship. Proponents of this view attribute a large role to the state in economic development and see a world "in which bureaucrats wield exceptional power and influence. Some want the United States to learn from the Japanese government's perceived success in facilitating development; others use the concept as justification for an activist U.S. policy to offset the effects on global competition caused by the intervention of the Japanese state.

Political institutions can help predispose a relationship to be cooperative or adversarial and can place constraints on business actions. As such, they offer insights into how the government perceives and attempts to carry out its role in economic development. For example, some Japanese bureaucrats perceive their role as promoting industrial development as a method to maintain control of the home market. However, these studies often fail to pay sufficient attention to the actions and initiatives of the private sector and so fail to fully account for variations in government-business relationships across industrial sectors and for instances in which public policies fail to achieve their stated purposes.

Advocates of the market approach depict political institutions as playing only a small role in promoting economic development. Their studies correctly point out the existence of a strong private sector in Japan and the developmental effects of competition. They stress that Japan's economic development resulted from a free market typified by intense competition and successful entrepreneurs and cite instances where the Japanese government failed to impose its ideas on business. In this context, the only legitimate government role is the creation of a macroeconomic environment conducive to business and the imposition of regulations to achieve social goals. However, in their attempt to demonstrate the supremacy of the private sector, they discount the role of states, and thus the importance of government-business interactions in shaping economic development. This assumption hinders the study of government-business relations by imposing an ideal in which there is as little interaction as possible.

3. The Interaction Perspective

The final perspective looks at interactions between government and business over a period of time. These studies recognize interaction between economic actors and government, and record instances of political conflict and compromise in Japan.

Studies using a interaction perspective record instances of government and private initiatives that result in market transformations but try not to presuppose the supremacy of the state or the market. They rely heavily on a detailed knowledge of interest group interactions within specific industries. They propose no monolithic government or business exists; rather there are many players and levels of interaction. Because a detailed knowledge of each industry is necessary, these studies are sometimes dismissed as presenting concepts that are unique to a specific industry and not transferable to other sectors or to economic development in general.

They do, however, delineate domestic and international factors that place constraints on, or encourage, interaction. And, interactions are what creates policy. They recognize that no single factor such as culture or the market can explain fully either the interactions themselves or economic development. they also imply that changing circumstances can alter both the interactions themselves and the role of individual factors in determining outcomes. Thus, the interaction perspective provides the best, although not the easiest, framework within which to analyze Japanese government-business interactions.

A Framework For Discussion

The changes in, and the types of, Japanese government-business interactions are complex. Interactions vary considerably depending on the situation, but at the same time there are elements of continuity. Interactions reveal that no monolithic government or private sector controls the relationship; rather many actors shape the relationship including Japanese government agencies, Japanese and foreign companies, foreign governments, multilateral organizations, and individuals. Most importantly, each of these actors precipitate interactions within the relationship that result in public policies.

Understanding that government-business relationships are complex interactions and contain elements of continuity and change is not sufficient to comprehend the ramifications of these relationships in global competition. The framework must include the major factors that shape the relationship.

The primary factors that I believe shape the government-business relationship are: 1) cultural and historical lessons that influence the behavior and decisions of policy makers; 2) the administrative rules, the perimeters agreed to by consensus or imposed by force, within which the government makes and carries out policy; 3) the competitiveness of an industry; and 4) the importance, real or perceived, of an industry to economic development.

Each of these factors affects the relationship by creating tendencies toward continuity or change, and by interacting with one another to create a dynamic environment. The potential effect of each factor must be carefully evaluated in relation to the others to discover how it affects any particular situation.

In general, cultural and historical lessons provide continuity throughout the relationship. Two such lessons have been especially important in Japan's postwar economic development. First, government and business accept that they each play a role in policy formation. Both suggest policy initiatives, although the government drafts the actual policies. Each side's acceptance of the other's role creates a tendency to formulate policy through negotiation. Second, government and business are aware of the close association between the international environment and competitiveness. Their awareness of this connection creates a sense of urgency and provides an incentive to work together.

Continuity does not mean that Japanese business and government always cooperate and agree; quite often they do not. Continuity also does not prevent change because the factors that create change often override it. Industry's competitiveness, and thus its ability to oppose and to shape government policy initiatives, change. The rules of the international environment such as the negotiation of new GATT protocols, and thus the government's ability to enforce policies or even to pursue certain policies, changes. And, an industry's importance to the economy changes, altering in turn the type of policies needed.

You can take these four factors and apply them to a specific industry, be it automobiles or biotechnology, and understand how the government-business relationship in that industry developed, operates now and how it might change.

Up to now, the result of the interaction of these four factors in most industries has been a Japanese government-business relationship that is dynamic and effective. Its effectiveness grew out of its interactiveness and out of the way in which the various factors affected each other during particular periods of time.

In the 1990s, some of the factors affecting the Japanese government-business relationship will change. The elements of continuity will remain, but the competitiveness of the Japanese economy and the international environment will change. If there is a change in the ruling party, administrative rules might change. In addition, interest is beginning to increase in policies that stress the achievement of broader societal goals such as better living standards for consumers. Indeed, MITI's "Vision for the 1990s" stresses the need for "human-oriented" international trade and industrial policies. The existence of strong competitive Japanese multinationals and the increase in global strategic alliances also will undoubtedly have an impact. It is too early to predict if the relationship's dynamism will remain and whether the acceptance of negotiation in policy making will remain as strong.

JAPANESE GOVERNMENT-BUSINESS RELATIONS

By Phyllis A. Genther*

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SUMMARY

As Japan has challenged the supremacy of older industrialized countries in technology-intensive products, perceived differences in government-business relations and their roles in global competitiveness have become an important aspect of the bilateral trade debate. Because this issue has been dealt with only peripherally in previous U.S.-Japan trade discussions over visible Japanese tariff and nontariff barriers, American policy makers are just now becoming aware of the complexities of Japanese government-business relations.

The government-business relationship is the institutional structure within which a nation and private companies interact and work together, or fail to work together, to formulate and implement commercial policy. While relationships differ across nations and across industries within nations, the need to define competition globally and to learn from Japanese economic development requires understanding how and why specific interactions occur.

Within this institutional structure, formal and informal interactions occur between government and business. These interactions are similar to those in other industrialized nations. They occur formally through mechanisms such as industry advisory councils and public hearings, and informally through the day-to-day contacts among government bureaucrats, industry

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* The author is the director of the Japan Technology Program, Technology Administration, U.S. Department of Commerce. This report is an analytical document and should not be construed as a statement of U.S. Department of Commerce policy. It is based on an excerpt from Genther, Phyllis A. *A History of Japan's Government-Business Relationship, The Passenger Car Industry*. Ann Arbor, Michigan, Center for Japanese Studies, University of Michigan, 1990.

From Japan's Economic Challenge, Joint Economic Committee, forthcoming

executives and trade association officials. Government attempts to direct industry through laws concerning subjects as diverse as taxes and land use, administrative regulations and various types of administrative guidance. Industry in turn attempts to influence government through political contributions, lobbying, petitions and industry consensus.

If the framework and tools of the government-business relationship are similar to those elsewhere, how is Japan different, and, if so, does it matter? The fundamental difference in Japan is that the acceptance of negotiation, and thus the acceptance of government and business involvement in commercial policy, facilitates the development and implementation of policies of which both industry and government approve. The Japanese government-business relationship matters because it affects Japan's economic development, which in turn affects global competition.

Because American policy makers frequently use perceived differences in U.S. and Japanese government-business relations to support or oppose domestic industrial policies and to justify both protectionist or free trade actions, it is essential to examine the realities involved. The realities in turn help determine if the Japanese government-business relationship is relevant for other nations' economic development and what role, if any, it should play in trade policy debates.

This article examines these realities by looking at Japanese government-business interactions. The first section delineates how U.S. policy makers and scholars have portrayed the Japanese government-business relationship. By understanding the perspectives used to analyze the relationship, we can establish a framework that is useful both for describing the realities of the relationship and for policy making. The second section describes the major factors that have affected how Japanese government and industry have interacted over time. It uses the automobile industry as an example to show how these factors affected policy choices. The conclusion discusses the relevance of the Japanese government-business relationship for trade policy decisions.

PERSPECTIVES ON JAPANESE GOVERNMENT-BUSINESS RELATIONS

U.S. perceptions of the relationship between Japanese government-business interactions and economic competition affects the development of U.S. trade policy. Without first understanding U.S. perceptions, it is impossible to understand the realities of Japanese government-business relations.

Differing perceptions about the role of government-business interactions are rooted in the way we analyze the nature and role of the international, American, and Japanese economies. These analyses provide a foundation from which to explore the complex interactions between Japanese government and industry. They approach the issue from several different perspectives, each of which contributes to our understanding of how and why specific interactions occur.

Since the late 1960s, awareness of international economic issues has increased substantially among American scholars and policy makers. Attention focused first on how the activities of global actors, such as multinational corporations and regional economic associations, affected the power of nations. There was an implicit assumption by most policy makers that economic issues were important because they affected political relationships and therefore were not assigned the same importance in and of themselves as political and defense issues. This assumption has been accepted by many policy makers and has reemerged in discussions over appropriate trade policies and the weight that should be given to economic versus political considerations in relationships among nations. A recent example is the internal U.S. debate during negotiations with Japan over the FSX aircraft.

As a result, policy makers paid little attention to how interactions between government and business within nations affected global trade competition or to how the international

economy, in turn, affected such interactions. There was little recognition that such interactions changed over time or of the factors that led to change.

When attention did turn to these interactions during the industrial policy debate of the early 1980s, another conceptual problem arose. Many policy makers were unable to separate their view of government-business relationships in global competition from their preferences concerning the role of the government in the American economy. Many studies sought proof of existing preferences rather than looking at how and why interactions occurred in Japan at different times. Thus, these studies dealt primarily with the ability of government to influence business or the ability of business to resist government intervention. This approach is not adequate to understand Japanese government-business interactions.

THE DOMESTIC PERSPECTIVE

Scholars who study American government-business relations often refer to the relationship as a static condition facilitating or hindering economic development by positing a fundamentally adversarial relationship in the United States versus a cooperative relationship in Japan.[1] They tend to transfer the way the relationship is dealt with as a domestic issue – primarily as the effect of regulatory policies – to the international arena. Since regulatory relationships involve the imposition of costs to achieve social goals or to control undesirable behavior, the studies do not have the tools to analyze instances of mutual cooperation.

In depicting government-business relationships as adversarial, scholars almost exclusively discuss interactions as effects of the domestic environment – legislation, culture, and historical experience. This perception leads them to trade policy options that stress that if weaknesses resulting from domestic, social, and technological changes are resolved, American businesses would be competitive and as such would resolve any international trade problems.

Because of this emphasis, some scholars writing about Japan from the domestic perspective discount the relevance of comparative studies of government-business relations in foreign countries altogether, ignoring the impact of the international environment and disregarding relevant foreign experiences.[2] While they show that interactions can be adversarial, they fail to discuss instances of cooperation or the existence of mutual goals. The traditional approach thus sheds light primarily on regulatory interactions and does not by itself offer a framework for understanding Japanese government-business relations.

THE JAPAN PERSPECTIVE

Policy makers have discussed government-business relations in the context of U.S.-Japan relations. For the purpose of examining and simplifying concepts that help us to understand Japanese government-business interactions, these studies fall into three basic groups. The first group views the relationship as a reflection of cultural and historical factors. The second group concentrates on the concept of industrial policy and the role government plays in economic growth. The third group looks at Japanese government-business relationships as an interactive partnership.

Historical and Cultural Determinants

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[1] For example, see Marcus, Alfred A. *The Adversary Economy*. Westport, Conn., Quorum Books, 1982; and, Gujarati, Damodar. *Government and Business*. New York, McGraw-Hill, 1984.

[2] Jacoby, Neil H., ed. *The Business-Government Relationship*. Pacific Palisades, Ca., Goodyear Publishing Company, 1975. p. 162.

Studies in the first group, which sees the government-business nexus as a reflection of cultural and historical factors, describe the relationship as the "missing element" that explains Japan's postwar economic performance.[3] They stress the "special and unique way in which the Japanese government guided the economy's development," a way influenced by Japan's history and culture.[4]

Historically, this group thinks the close communication between government and the business community, which these writers believe has existed since the Meiji era (1868-1912), is one of the most important elements in Japanese government-business relations. Because Japan was forced to open its country to the rest of the world, it had to design policies to achieve the rapid and forced growth of industry to avoid being partitioned like China. Thus, the unique relationship between government and business – a special coalition between the bureaucracy and the private sector – grew out of the Meiji government's attempts to foster modern industry through various subsidies.

The cultural elements stem from Confucianism and native traditions. They often are behind references to "consensual decision making," the "group spirit," or "the vertical society."[5] In the context of government-business relations, this view implies that Japanese leaders are conditioned by their culture to preserve harmony in their relations, as for example in the postwar practice of consensual decision making, *ringi sei*. It also implies that horizontal business mergers are difficult to achieve because they go against cultural predispositions toward vertical relationships and group cohesiveness.

This group of studies, like studies done from the domestic approach, provide only a partial insight into government-business interactions as a trade issue. Policy makers are to some extent guided by cultural norms and historical experiences. These factors offer insights into such practices as the formation of coalitions, provide policy makers with historical lessons, and remind us that culture can affect how events and concepts are perceived. But, if cultural and historical contexts are the primary shapers of the government-business relationship, we would expect the relationship to change quite slowly and we would be able to explain all current behavior as extensions of some previous pattern. These patterns, however, are often overridden by other considerations.

Industrial Policy Perspective

This category of study examines the Japanese government-business relationship within the context of industrial policy and the role of government policy in economic development. It asks whether government or business is primarily responsible for Japan's rapid economic development. This category includes two approaches; one supports the supremacy of the state, the other the importance of markets.

The statist approach often presents political institutions, such as Ministry of International Trade and Industry (MITI), as the primary determinants of the government-business relationship.[6] Proponents of this point of view attribute a large role to the state in economic development

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[3] U.S. Department of Commerce. *Japan, The Government-Business Relationship*. Washington, U.S. Govt. Print. Off., February 1972.

[4] Ibid.

[5] For example, see: Nakane, Chie. *Japanese Society*. Berkeley, University of California Press, 1970.

[6] For example, see: Johnston, Chalmers. *MITI and the Japanese Miracle*. Stanford, Stanford University Press, 1982.

and see a world "in which bureaucrats wield exceptional power and influence."[7] Some want the United States to learn from the Japanese government's perceived success in facilitating development; others use the concept as justification for an activist U.S. trade policy to offset the effects on world trade caused by the intervention of the Japanese state.

Political institutions can help predispose a relationship to be cooperative or adversarial and can place constraints on business actions. As such, they offer insights into how the government perceives and attempts to carry out its role in economic development. For example, some Japanese bureaucrats perceive their role in promoting industrial development as a method to maintain control of the Japanese home market.[8] However, these studies often fail to pay sufficient attention to the actions and initiatives of the private sector and so fail to account fully for variations in government-business relationships across industrial sectors and for instances in which public policies fail to achieve their stated purposes.

Advocates of the market approach depict political institutions as playing only a small role in promoting economic development. Their studies correctly point out the existence of a strong private sector in Japan and the developmental effects of competition. They stress that Japan's economic development resulted from a free market typified by intense competition and successful entrepreneurs and cite instances where the Japanese government failed to impose its ideas on business. In this context, the only legitimate government role is the creation of a macroeconomic environment conducive to business and the imposition of regulations to achieve social goals. However, in their attempt to demonstrate the supremacy of the private sector, they discount the role of states, and thus the importance of government-business interactions in shaping economic development.

The separation of politics and economics reflects an academic tradition dating to 18th-century classical economic theories and to later 19th-century neoclassical economists such as Alfred Marshall.[9] Theorists separated the two disciplines by arguing that while economics is a system based on production, distribution, and consumption that operates under natural laws, politics is a system of power, influence, and public decision making that disrupts natural laws but is necessary to provide essential services such as defense. Therefore, the disruptive influence of government should be excluded from the harmonious economy. This underlying assumption obviously hinders the study of government-business interactions by imposing an ideal in which there is as little interaction as possible.

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[7] Halberstam, David. *The Reckoning*. New York, William Morrow and Company, 1986. p. 27.

[8] Tsuruta, Toshimasa. *Sengo Nihon no Sangyo Seisaku*. Tokyo, Nihon Keizai Shimbunsha, 1982. p. 1–187.

[9] Many liberal economists, who espouse the preeminence of the market mechanism and price competition, trace their ideas to the work of the British philosopher, John Stuart Mill. Mill emphasized the primary value of liberty [individualized choice]. Therefore, he preached that the power of the government in any form should be minimized, stating that "laissez-faire should be the general practice; every departure from it, unless required by some greater good, is a certain evil" (idem, *Principles of Political Economy* [London, 1864], p. 569). Many Japanese, on the other hand, believe that "excessive competition" can result in overproduction, price cutting, loan defaults and the bankruptcy of major companies. Therefore, there is a legitimate role for government in strengthening the economy in preparation for international competition.

Interaction Perspective

This group looks at interactions between government and business over a period of time. Richard Samuels terms this interaction "the politics of reciprocal consent," in which a partnership exists in a constant state of negotiation and renegotiation. Other recent studies also recognize interaction between economic actors and the government, and record instances of political conflict and compromise in Japan.[10]

Studies using an interaction perspective record instances of government and private initiatives that result in market transformations but try not to presuppose the supremacy of the state or the market. They rely heavily on a detailed knowledge of interest group interactions within specific industries. They propose that no monolithic government or business exists; rather there are many players and levels of interaction. Because a detailed knowledge of each industry is necessary, these studies sometimes are dismissed as presenting concepts that are unique to a specific industry and not transferable to other sectors or to economic development in general.

They do, however, delineate domestic and international factors that place constraints on, or encourage, interaction. They recognize that no single factor such as culture or the market can explain fully either the interactions themselves or economic development. They also imply that changing circumstances can alter both the interactions themselves and the role of individual factors in determining outcomes. Thus, the interaction perspective provides the best framework within which to analyze interactions between Japanese government and business.

A FRAMEWORK FOR JAPANESE GOVERNMENT-BUSINESS INTERACTIONS

The changes in and the types of Japanese government-business interactions are complex. Interactions vary considerably depending on the situation, but at the same time there are elements of continuity. Interactions also reveal that no monolithic government or private sector controls the relationship; rather many actors shape the relationship including Japanese government agencies, Japanese and foreign companies, foreign governments, multilateral organizations, and individuals. Most importantly, each of these actors precipitate interactions within the relationship that result in public policies.

Understanding that government-business relationships are complex interactions and contain elements of continuity and change is not sufficient to comprehend the ramifications of these relationships in global competition. But this understanding does lead to three further questions. What are the major factors that shape the relationship by creating change and providing continuity? How did the government-business relationship contribute to Japan's global industrial competitiveness? And, what insights exist into the development of policies to cope with the government-business relations issue in the context of international trade?

Complex government-business interactions are easiest to conceptualize by analyzing a specific industry. The Japanese automobile industry is a particularly provocative and instructive example because it reveals that the effectiveness as well as the ineffectiveness of certain Japanese public policies and partially reflects the way government and business interact. Changes in the government-business relationship in the automobile industry also often have presaged changes in the Japanese government-business relationship overall. Finally, because interactions in the Japanese automobile industry reflect many different patterns, it is possible to use this

[10] Samuels, Richard J. *The Business of the Japanese State*. Ithaca, Cornell University Press, 1987. p. 1-290.

industry's government-business relationship to support opposing positions in the trade debate and in analyses of the role of industrial policy in Japanese economic development.

THE FACTORS

Interactions in Japan depend on several major factors. These factors are revealed in the history of the relationship between the Japanese government and the automobile industry from its origins to the 1980s. They are: (1) cultural and historical lessons that influence the behavior and decisions of policy makers; (2) administrative rules, the parameters agreed to by consensus or imposed by force within which the government makes and carries out policy; (3) the competitiveness of an industry; and (4) the importance, real or perceived, of an industry to economic development.

Cultural and Historical Lessons

Culture and history provide continuity in the relationship. Culture helps to reinforce the constant of negotiation in the government-business partnership. History provides policy makers in government and business with lessons they remember and creates common perceptions of the competitive environment that are reflected in policy.

Japanese culture, through its emphasis on harmony, promotes consensus building. Consensus building in turn reinforces a policy making pattern based on negotiation, negotiation being the recognition of the interdependence between government and business that results in formal and informal bargaining and accommodation. Thus, while there was much disagreement during the development of the Japanese automobile industry between government and business, conflict did not result in polarized positions and rarely in open confrontation. Each side accepted the other's right to a role in policy formation even when it was not enamored of the other's position. Ultimately, compromises were worked out that helped grant a certain legitimacy to public policies. This resulted in a pattern of negotiated policies. The effect of this pattern was directly apparent in relations between the Japanese government and the automobile industry in the development of emissions policies in the 1970s and the role of advisory commissions (*shingikai*) in the postwar period, and indirectly evident in the acceptance of the right of all parties to have a role in policy formation.

In contrast, cultural tendencies toward vertical relationships heightened adversarial relations when MITI attempted to create horizontal mergers among the automobile companies in the 1960s in an attempt to create a few strong producers who could withstand internationalization. The industry rebelled even though the businessmen who were members of the relevant advisory committee agreed in principle with the government's concern over excessive competition. They rebelled partially because horizontal mergers went against the cultural tendency toward vertical value order and because no company wanted to be the one shut out of the market.[11]

Policy implementation through administrative rather than legislative means reveals another indirect effect of culture. Culture reinforces the tendency to avoid the direct confrontations more common with legislative methods of policy implementation, especially with regulatory policies. Thus, while culture does not create administrative guidance, it reinforces the industry's responsiveness to the Japanese government's frequent use of it.

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[11] For an example of a study that includes culture as a factor, see: Dore, Ronald. *Taking Japan Seriously: A Confucian Perspective in Leading Economic Issues.* Stanford, Stanford University Press, 1987.

History, through the lessons it teaches, also provides continuity in the relationship. In the 1950s, Japanese government and business policy makers remembered their lessons about the possible negative impact of foreign capital and unrestrained imports on an uncompetitive infant domestic industry during the 1930s when American vehicle makers almost overwhelmed Japanese domestic producers. These lessons grew out of experiences common to most of Japanese industry during the prewar period.

Because government and business learned the same lessons, they sought, and cooperated in creating, policies that lessened the vulnerability of the industry through protective measures or technological innovation. These experiences led to a widespread awareness of the international environment's role in creating and in undermining competitiveness. Everyone knew that General Motors, Ford, and other foreign companies were not only competitors but also models to emulate.

History also teaches that Japanese exports might be discriminated against and denied access to foreign markets. Discussions over Japan's membership in multilateral organizations reinforced this lesson in the 1950s as did tension over textiles in the 1930s. It helped shape protectionist and developmental policies during the internationalization period in the 1960s and 1970s and created a sense among policy makers during the U.S.-Japan automobile crisis of 1979-80, especially in the Ministry of Foreign Affairs and eventually in MITI, that Japan would have to compromise to preserve its overall market access.

While culture and history provide continuity in the relationship, other factors, especially administrative rules and competitiveness, often override them to create change.

Administrative Rules

The administrative rules under which the government operates affect the relationship – rules being the parameters agreed to by consensus or imposed by force within which the government made and carried out policy.[12] Administrative rules need not be formal. The rules arose from the domestic environment (e.g., military or civilian government) and from the international environment (e.g., the Occupation authorities and multilateral trade agreements). The rules on interactions are most apparent for the automobile industry when comparing the wartime and postwar periods.

From approximately the time of the Manchurian Incident in 1931 to 1945, the relationship between the automobile industry and the Japanese government was characterized by the subordination of industry to military needs. Subordination did not mean that interaction and negotiation did not occur; Toyota and Nissan held discussions with the Ministry of Commerce and Industry (MITI's predecessor) about the Automobile Manufacturing Law in 1935 which sought to exclude foreign producers and establish truck production, and the formation of the Survey Committee for the Establishment of the Automobile Industry in 1931 that included government, industry and academic representatives are evidence to the contrary. However, subordination did place strong constraints on business by specifying what type of vehicles could be produced (trucks), what companies would produce them (Toyota, Nissan and Diesel Jidosha Kogyo), and who would get raw materials. Nissan and Toyota used this period to gain entrance into the Japanese automobile market, but they had to develop production plans within the boundaries set by what the government felt was important. Most importantly, the government did not permit them to make passenger cars and forced them to work through the government-mandated control associations to obtain materials and to sell.

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[12] Several studies stress the importance of institutional structures in policy formation including: Johnston, *MITI and the Japanese Miracle*.

Beginning in the Occupation period (1945-1952), industry was able to exert greater and more direct influence over public policy. The wartime control associations evolved into voluntary trade associations. Regulations prohibiting passenger car research and production were repealed. Companies no longer had to be authorized in order to produce, which allowed new companies to enter the industry. The government worked more closely with the industry, sought its advice, and received unsolicited advice, when developing initiatives to propose to the Supreme Commander for the Allied Powers (SCAP). MITI's 1952 policy paper on the automobile industry that argued the importance of the motor vehicle industry for economic development also incorporated industry's views. In fact, in the late 1940s one of the first tasks of the Automobile Manufacturers Association (one of the predecessors of the Japan Automobile Manufacturers Association) was to lobby SCAP and the Japanese government to support the industry and to help build an industry consensus – a role it continued to play during liberalization in the 1960s, the negotiation of export restraints, and up to the present. When industry's views were overlooked, as occurred during the People's Car Project in 1955 when MITI sought to fund a single producer to make a small car, business was likely to oppose government policies.

Japan's parliamentary structure also affects interactions. It helps reinforce the tendency, along with culture, to use administrative rather than legislative methods of policy implementation. It also is responsible for the existence of an elite bureaucracy that takes the governmental lead, rather than the legislature, in policy formation. This structure permits more cooperation and negotiation because issues are not politicized as often. When issues are politicized, as in the case of auto emissions in the 1970s, there was much less room for government and business to maneuver in their negotiations. In addition, the bureaucracy has more respect and influence under Japan's parliamentary system, which helps make close and continuous consultation with industry possible.

The rules continued to change after independence, albeit more subtly. The changes in the rules in the 1950s and 1960s reflected constraints put in place by the international environment more so than any change in domestic institutions. In the 1950s, the government controlled foreign exchange allocation, which gave it leverage in its negotiations with business. It threatened to cut off foreign exchange for those automobile companies that did not fulfill the domestic content provisions of technology tieup agreements it had agreed to for four major producers in the early 1950s to speed up their technological development, but at the same time allocated companies foreign exchange to import machine tools. It was able to enact protective policies that restrained imports and developmental policies that promoted demand and technological innovation because of its transitional status under multilateral arrangements and because the United States wanted Japan to be an economic bulwark against communism in Asia and so tolerated Japanese protectionism. Automobile-related businesses, especially the larger companies, benefited from these controls that kept imports (and some smaller Japanese companies) out of the market.

After Japan joined the IMF, the OECD and the GATT, the government lost some control over foreign exchange and had to liberalize its market. These changes lessened the government's leverage over industry. The government sought new forms of influence, which resulted in the ill-fated Special Measures Law for the Promotion of Designated Industries of the 1960s which sought to merge companies to create larger firms that many Japanese felt would be more able to survive foreign competition after liberalization. Thus, because the international environment created changes in the administrative rules in Japan, in spite of the endorsement of the merger concept by special industry advisory committees, the government could not force business to accept merger schemes, and it lost much of its control over foreign capital investment in the 1970s. As a result, even though the government preferred mergers among domestic companies to tieups between domestic and foreign companies, Mitsubishi, Isuzu, and Mazda concluded partnerships with foreign firms.

Administrative rules constrain how government and business interact to create policy and affect the amount of leverage government has over business. Again, interaction and negotiation remain, but they operate under different constraints at different times.

Competitiveness

The automobile industry's competitiveness strongly affects its relationship with government – competitiveness being the ability of industry to compete globally without government protection or, in other words, the industry's vulnerability in the international environment.

A competitive mature industry with wide-ranging influence on the economy and a vulnerable infant industry with potential can both be perceived as economically important. However, the relationship between government and business differs in these two cases because of competitiveness.

The competitiveness of the Japanese passenger car industry was low and its vulnerability high through the 1950s. In the 1930s, General Motors, Ford and Chrysler had onshore assembly plants. Japanese domestic production was small and of bad quality. The industry survived primarily because the American companies were forced out of the market. In the 1950s, European small car exports and foreign companies' attempts to establish sales subsidiaries threatened the Japanese domestic producers again. The still uncompetitive passenger car industry needed and accepted protective and developmental incentives that involved a high level of government direction but gave it room to experiment with new technology and to adapt industrial practices to meet local conditions.[13]

As the automobile industry became competitive, its interactions with the government grew more adversarial. During the 1960s and 1970s, companies increasingly opposed government policy initiatives that they felt were not in their best interest even though they still often agreed on the basic problems being addressed. The Mitsubishi/Chrysler tieup and Honda's decision to manufacture passenger cars in the 1960s are clear examples of industry opposition to government wishes. However, even in this period, industry cooperated with the government in forming policies to delay liberalization. This cooperation continued until some companies saw that it was not in their best interest, a decision possible because of changes in competitiveness and administrative rules.

An industry's competitiveness affects public policy options. Initially, government and business used protective and developmental policies to help the automobile industry grow. After the industry matured, policies expanded to include regulatory controls on emissions, safety requirements, and restraints on exports. There were fewer incentives for the industry to cooperate with these intrinsically restrictive regulatory policies than with the earlier developmental policies. (It is always easier to cooperate when someone else is being penalized, i.e., a foreign producer, and when someone else is responsible for implementing an agreed upon policy, i.e., the government.) After much hesitation the industry did cooperate with the government on emissions controls, but only after the smaller companies perceived an opportunity to use the controls to increase market share. The industry strongly opposed export controls. It accepted them only to prevent the threatened enactment of restrictive American local content legislation. The industry's competitiveness in the 1970s also allowed it to have its own listening posts in Washington, adding an independent source of information and yet another dimension to its negotiations with the Japanese government on trade over export restraints and auto parts procurement in the 1980s.

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[13] Cusamano, Michael A. *The Japanese Automobile Industry*. Cambridge, Harvard University Press, 1985. p. 7.

Economic Importance

The automobile industry's importance – real or perceived – to the economy also influences how government and business interact. Those who argue that industrial policy did not affect the automobile industry's economic development point out that this industry was not at the center of economic development plans and was only one of many "key" industries. However, these facts do not negate the relationship or the possibility that assistance, even if not as large as in some industries, was provided because the industry was perceived as important.

Prior to the 1930s, the industry was so small that interaction was limited to a small military subsidy program for trucks. As the industry proved crucial to foreign exchange conservation and to military strength, the relationship grew more active. The government attempted to create a national vehicle, the "Isuzu," in 1929. When this attempt failed, the government worked with Toyota and Nissan in the mid-1930s to create a domestic truck industry.

After World War II, the industry lobbied the government to support the industry's interests with the Occupation authorities. The government cooperated but did not place the same importance on the automobile industry as it did on other more basic industries such as steel. Toward the end of the Occupation, a discussion between MITI and certain members of the financial community on the feasibility of developing a domestic passenger car industry revolved around different perceptions of the industry's economic importance. MITI argued that it was important for the development of the machinery industry; members of the financial community were unconvinced. Ultimately the industry's potential for economic development, demonstrated by procurement of Japanese vehicles during the Korean War, swayed those who had previously been unenthusiastic. The government then supported the industry through a variety of protective and developmental policies. These policies in turn created an atmosphere conducive to cooperation.

The industry, however, still was not at the center of economic development plans and received just enough assistance to provide minimal survival security. The decision to provide only minimal financial support did not lessen the amount of interaction that occurred, it just occurred on other issues. By the mid-1950s and even more so by the 1960s, the government fully agreed with the industry that it was central to economic development and, so, sheltered the industry from liberalization for as long as possible.

The industry's and government's similar goals in the initial postwar period contributed to a cooperative relationship and to the economic development of the industry. Agreement on the economic importance of the industry, however, could not sustain a cooperative relationship when substantial disagreement developed about specific methods and policies at the same time that competitiveness had increased the industry's leverage and the administrative rules had changed.

SUMMARY

Each factor affects the government-business relationship by creating tendencies toward continuity or change, and by interacting with one another to create a dynamic environment. The potential effect of each factor must be carefully evaluated in relation to the others to discover how it affects any particular situation.

Cultural and historical lessons provide continuity throughout the relationship. Two such lessons are especially important. First, government and business accept that they each play a role in policy formation. Both suggest policy initiatives, although the government drafts the actual policies. Each side's acceptance of the other's role helps create a tendency to formulate policy through negotiation. Second, government and business are aware of the close association between the international environment and competitiveness. Their awareness of this connection creates a sense of urgency and provides an incentive to work together.

Continuity does not mean that business and government always cooperate and agree; quite often they do not. Continuity also does not prevent change because factors that create change often override it. Industry's competitiveness, and thus its ability to oppose government policy initiatives, changes. The rules of the international environment, and thus the government's ability to enforce policies, change. And, the industry's importance to the economy changes, altering in turn the type of policies needed.

The result has been a Japanese government-business relationship that is dynamic and effective. It is important, however, to understand that the effectiveness of the relationship grew out of its interactiveness and out of the way in which the various factors affected each other during particular periods of time.

CONCLUSION

Government-business relationships are relevant for trade policy decisions. They are relevant because they affect economic development, which in turn affects global competition. Global competition then in turn affects every country's government-business relationship. Because true competitiveness increasingly is found and tested in the global arena, not the domestic market, policy makers at the very least need to know why different relationships exist and how they interact. This understanding will help policy makers develop better methods to influence behavior and to reach solutions acceptable to all parties.

The Japanese example shows that ideologically-based explanations of government-business relationships are invalid and culture bound. The trade debate over industrial policy and the role of government-business relationships tends to use such explanations to justify policy actions. However, such explanations fail to reveal the interactiveness of relationships and fail to take into account differing situations among countries and among industries within a country. Policies need to adjust to the fact that relationships change as the factors around them change. Therefore, policy makers need to seek out those factors for specific industries that promote continuity and discover how, or if, they will be overridden by other factors that create change.

Japan also shows that different government-business relationships lead to different policy choices and to different degrees of success for policy implementation. Whether or not the resulting policy choices and their implementation will encourage or discourage competitiveness is highly dependent on the interaction of many factors, including the international environment. It challenges a long-held assumption that government-business relationships arise purely out of domestic issues and that these relationships are not pertinent to trade policy formation.

The Japanese government-business relationship and the policies it engendered facilitated the development of Japan's automobile industry by protecting the industry in its formative stages and by providing developmental incentives. These measures gave industry the minimal security it needed to experiment and to grow before it had to test its competitiveness in export markets and in its home market against foreign competitors. These measures grew out of interactions among many governmental and private actors, not simply from a prescient government or a competitive market. The current government-business relationship does the same for newly developing industries, but interactions are subject to greater constraints from the international environment than existed in the 1950s and 1960s.

Given this, it is necessary to remember that, just as the government-business relationship reflects the interaction of several factors, many factors contribute to the creation of a successful industry. The Japanese automobile industry grew because of strong entrepreneurs, a competitive market, an educated population, and developmental timing. The list of factors for the automobile industry, and for other Japanese industries, is infinite.

However, just as certain factors are more important than others in shaping government-business interactions, some factors are more important in economic development. For Japan, one of those factors has been the government-business relationship.

The relationship is important to economic development first because of the acceptance of negotiation, and thus the acceptance of the involvement of both government and business, facilitates the development and implementation of policies of which both industry and government approve. In instances where consensus cannot be achieved, often industry is competitive enough to no longer need help.

Negotiation existed in Japan before the postwar period but did not lead to as dynamic an industry because business initiative was inhibited. The creation of a market economy and changes in administrative rules removed restrictions on business and gave it a stronger role in the partnership. Thus, in postwar Japan both government and business are free to play roles in policy making.

A negotiated set of public policies is the aspect of the relationship often cited by those seeking protectionist policies in the United States. They see these policies as evidence of a collusive partnership to overtake world markets. The partnership, however, rather is one that recognizes a mutual goal to develop competitive industries to protect the home market, which results in the added benefit of competitive exports. The policies developed often are not systematically planned but result from negotiation, an awareness of the international environment, and the perceived economic importance of specific industries. Whether or not the ramifications of this goal still are acceptable to other nations or will have to be modified given Japan's new economic strength currently is being discussed.

Finally, without the acceptance of negotiation in policy formation, important viewpoints from government and business go untapped in developing policies to meet global competitive challenges. Without international pressure on Japan to meet its obligations under multilateral agreements, Japanese industry would not feel as pressured to become competitive quickly.

In the 1990s, some of the factors affecting the Japanese government-business relationship will change. The elements of continuity will remain, but the competitiveness of the Japanese economy and the international environment will change. If there is a switch in the ruling party, administrative rules might change. In addition, interest is beginning to increase in policies that stress the achievement of broader societal goals such as better living standards for consumers. The existence of strong competitive Japanese multinationals and the increase in global strategic alliances also will undoubtedly have an impact on the Japanese government-business relationship. It is too early to predict if the relationship's dynamism will remain and whether the acceptance of negotiation in policy making will remain as strong.

Senator BINGAMAN. Thank you very much.
Mr. Dore, we're pleased to have you here. Go right ahead.

STATEMENT OF MR. DONALD DORE, ADJUNCT PROFESSOR, DEPARTMENT OF POLITICAL SCIENCE, M.I.T.

Mr. DORE. Thank you, Mr. Chairman. I've been asked to talk about Education and Training, Labor Relations and Technology. And I suppose I shall not be conveying any news to anyone when I start by noting that the general education system in Japan delivers young entering cohorts into the labor market who have a very high level of numeracy, literacy, and oracy—of general education—as is demonstrated by a very impressive accumulation of international studies in which, I must say, your country and my own country, the United Kingdom, come out rather badly.

One or two points about that. First of all, these results are achieved by a very considerable intensity of schooling. Japanese children go to school for more hours a day, for more days a week and for more weeks a year than is normal in North America or in Europe.

A colleague calculated that, in 12 years of general education in Japan, children pack in as many classroom hours as would be included in 16 years in the United States. And that's a very considerable difference.

Second point. The teachers in the Japanese general education system have relatively high prestige in society and are well-paid. They're better paid than policemen, for example. And entering graduates teaching in high school are better paid than entering graduates teaching in universities.

Another point. There is no tracking in Japanese schools until the age of 15, and there is only a very small flight of the middle classes from the State system into private education, a total of about 3 percent of the junior high school education, most of them in selective special ability private schools.

A third point which relates to the no tracking you see to attain these very high levels of achievement in schools in which children of all abilities are kept together until the age of 15 does require not only very high-quality teachers, but it also requires patterns of organization; training children to help each other.

And this has pay-offs in other ways, as well. It means that children learn not only to read and write and count, they also learn to cooperate. And this social product—what one might also call the moral product—of the schools is equally important to understanding the quality of Japanese working life. It's not just what the school does in cultivating brains, it's also what it does to cultivate conscientiousness.

I think it's characteristic of the products of the Japanese school system to feel that sloppiness is a sin, that doing a good job as an end in itself is a moral duty, something which we used to call the Protestant Ethic, but which, given the distribution of these qualities around the globe these days, I think people are increasingly calling the Confucian Ethic.

One final point about the Japanese school system. Economists divide the function of education into the human capital investment

function and the screening functions, what schools do to transform people's capacities substantively on the one hand and what schools do by giving certificates to label people are being more or less bright than other people.

One of the characteristics of the Japanese system is that the screening function as opposed to the human capital investment is much more salient and much more clearly marked and much more transparent. Perhaps the best way of making this point is to suppose that the S.A.T.—of which the Japanese have many equivalents—were the only criterion for admission to universities in this country and that the only people who got in to Harvard and the Ivy League universities were the people with the highest scores in the S.A.T. test.

Imagine also that there is another S.A.T. for 15-year-olds, that the high school you get into is also determined by your score on something like the S.A.T. test.

Imagine also that the labor market that most young people at school are concerned with is the labor market for the large corporations which select very carefully for careers, not just for jobs. They select people for lifetime employment. And they select people not according to what their certificates say about what they know already, but according to what their certificates say about how bright they are, how good learners they're going to be for the rest of their career.

Given that, it is not surprising that the motivation to learn is as high as it is in Japan. And it is not surprising also that the intensity of schooling, as I mentioned earlier, is maintained and, in fact, reinforced by a very considerable investment on the part of a large number of parents who send their children to special cram schools, private cram schools.

The second general area that I want to mention, the way in which employment systems and the educational system reinforce and complement each other—I've already referred to the way in which the lifetime employment practice reinforces the screening use of education certificates in Japanese society.

I think also one can say that the work ethic aspect of it is reinforced by the patterns of employment. If I can put it very crudely and roughly, I think one can divide the capitalist systems of the world on a spectrum at one end of which are the countries where the corporation, the business corporation, is primarily defined as a piece of property owned by shareholders and, at the other end of the spectrum, societies where a corporation is primarily defined as a community of people, of managers and their subordinates.

I think my own country, Britain and the United States are probably at the extreme property end of that spectrum and Japan at the extreme community end. But, other countries, like Germany and Sweden, for example, also find themselves closer to Japan than they do to us.

Now, what does this mean? It means, for example, that hostile takeovers are practically unknown in Japan, as Dick Nanto has mentioned when talking about the keiretsu.

It means that the notion of buying a company simply by acquiring its shares in the stock market over the opposition of its managers and employees simply is socially outrageous. It also means that

in times of recession dividends are cut, and top managers' salaries are cut before there is any talk of making people redundant and showing them the door.

That, of course, gives the ordinary worker in the firm, who has a lifetime guarantee of employment, who joins that firm for a career, and not simply to do a job at an attractive wage, that the members of that firm do have personal incentives to see the firm prosper.

This I think is, as it were, institutional reinforcement in the company of the work ethic that the schools initially provide.

Now, let me get on to technological change because the paradox about Japan, obviously, is that a lifetime employment system prevents firms from making the sorts of adjustments that are increasingly necessary for business firms in a technologically rapidly changing economy.

And, yet, it does seem that Japanese corporations, in spite of the fact that they do not have the option of dismissing the labor force in factories that are producing goods that the market no longer wants, Japanese firms turn out to be more flexible than their competitors.

The answer as to why is, first of all, because the very fact that corporations are committed to employing their employees means that when they see signs of a market decline, of the contraction of a market for one of their products—when they see that in one of their markets, the growth rate is less than the growth rate of GNP—then they know they have to begin to plan to move into new markets, or to do something to revitalize the markets that they have.

And that means that the long-range planning and investment for diversification within companies is given an extra motive by lifetime employment.

Secondly, a natural consequence of lifetime employment is that labor unions in Japan are enterprise unions, which include junior managers, which include all those, in other words, who are sufficiently far from the decision-making centers of the corporation that they may need collective representations when they feel that their interests are not being taken care of.

That is a short definition of the function of enterprise labor unions in Japan. Being enterprise labor unions, unions which unite the employees of single companies, they are easily persuaded that their activities must contribute to the prosperity of the company.

And the third reason why the system leads to greater flexibility is because of the training aspects. It is because, since firms have got people for life, they can be sure that their investments in the training of their employees are going to pay off in subsequent service, in the work which those employees will give them over the rest of their careers.

This means that diversification plans which depend not on acquisition of other companies but on building project teams internally and developing new lines of production out of the internal resources of the company, that the training inputs that are necessary for this payoff are worthwhile.

This is one of the features that ensures that Japanese companies are learning organizations.

Now, just two words about what lessons one might learn. I suppose there are some simple, easily transferrable lessons, like pay teachers more in order to recruit them from a higher position in the ability spectrum. But, primarily, I think we have to think about ways in which employers in a society like ours, in which lifetime employment isn't going to happen and in which labor is inevitably going to be mobile, we have to think of ways in which employers in a labor-mobile society can have the same incentives for training their employees as employers in a society like Japan, who have their employees for life.

I think that means thinking up of a lot of ingenious schemes for collectivizing, if you like, the costs and benefits of training so that the conscientious employers who do a lot of training and then lose their people to other firms do not lose out.

[The prepared statement of Ronald J. Dore follows:]

PREPARED STATEMENT OF RONALD J. DORE

EMPLOYEE TRAINING AND STRUCTURAL CHANGE IN JAPAN [1]

I. FLEXIBILITY IN LABOR MARKETS

The combination of cyclical resilience and capacity for structural change has many sources in the Japanese economy: high savings rates and a propensity to put a high proportion of savings into manufacturing investment; the financial structure of Japanese enterprises (and strong conventions prohibiting contested take-overs) which permit investments with long time horizons; good mechanisms for procuring consensus on macroeconomic and industrial policy; and a dynamic and hard-working (some would say workaholic) managerial cadre with an entrepreneurial flair. But one essential element, also, is a capacity for rapid manpouer adjustment.

"Flexibility in labor markets" has, in recent years, become the standard code phrase used by economists to describe the preconditions for rapid manpower adjustment. It refers to two different processes which it is best to keep separate:

(a) The ability of economic agents to adjust their inputs of labor (their effort in the case of the self-employed, the numbers of their employees or their work hours, and hence their wage bill in the case of employers) to changes in the level of demand with fluctuations in the business cycle.

(b) The more long-term and dynamic process by which workers—research workers, managerial workers, technicians and clerks, and operatives—adjust to the changes brought about by new products and services, by new technologies, and by new patterns of demand, both those new demand patterns brought by changing consumer tastes, and those resulting from changing patterns of comparative advantage, including those caused by fluctuating exchange rates.

The former involves consideration of the practices of dismissal, lay-off and recruitment, the latter a much more complex study of the way individuals and organizations whereby men and women acquire the new skills that are needed; how far the opportunities for training go to the right kind of people; how far those who get training have the right kind of opportunities to use their new skills and how they find those opportunities; and how far those whose hitherto useful skills become redundant are accommodated in the jobs which remain or are newly created.

The well-known "lifetime commitment" pattern of employment in Japan's major corporations and government bureaucracies means that market processes play a much smaller, and administrative processes a much larger part in adjusting work hours, less a matter of hire and fire. Long-range dynamic adjustment is more a matter of intergeneration transition and internal redeployment, less a matter of markets, either external or internal.

(a) How exactly does the internal redeployment system work, how efficient is it in making a source of flexibility out of the seeming rigidity of lifetime employment, and how pervasive is it in the economy?

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[1] The material in this statement is drawn from Japan at *Work: Markets, Management and Flexibility* (OECD 1989), Ronald Dore, Jean Bounine-Cabales, and Kari Tapiola, and "Employee Training in Japan" (OTA 1990), Ronald Dore and David Cairncross.

(b) Is there any apparent change in the balance between the importance of external mid-career labor markets and that of internal redeployment mechanisms in securing change? What does the Japanese experience show about the role of public policy in improving the: (1) Process of generational transition by facilitating retirement and updating/adjusting pre-career vocational training systems to the demands of expanding industries; (2) mechanisms of the external mid-career labor market, particularly by the provision of retraining opportunities; and (3) mechanisms of internal redeployment by assistance for internal training or intra-enterprise relocation; and about the relative value-for-money of the last two—the relative efficiency, that is, of public training investment to support training in the external labor market and that to support training within the enterprise?

(c) A successful economy requires that the loss of jobs in industries in decline or subject to rapid substitution of capital for labor should be matched by the growth of new forms of production providing equivalent numbers of new job opportunities (plus or minus demographic change and change in the desire to participate). European economies have seen the growth of structural unemployment as a result of the latter job-creating process failing to match the former job destroying one. The Japanese economy has succeeded in holding down rates of unemployment which, if seeming secularly to increase, will remain below 3 percent. Clearly, this capacity to maintain employment must owe a great deal to such factors as the strength of the R&D effort, savings and investment rates, long time horizons for investment, market research and entrepreneurial flair. But how far is it also to be attributed in part to the efficiency of these mechanisms of transition in the deployment of human resources?

II. Japanese Vocational Education and Training: Some Salient Features

Insofar as new recruits to Japanese firms prove quicker and more thorough learners than their American counterparts, this is to be attributed more to the excellence of their general education than to any specifically vocational elements in their pre-employment training.

Rigid job-tenure systems in schools and universities make the curricula of vocational faculties and schools within the public system (including the so-called private universities) if anything, more rigid than elsewhere. The unsubsidized, for-profit, commercial and technical colleges specialize almost exclusively in one-year and two-year courses for recent school-leavers. They perform an important role for certain intermediate-skill commercial and technical professions, particularly in services, but are of lesser importance for manufacturing. The standardization of expected achievement levels and their certification is little developed.

The historical experience of rapid productivity growth rates through the absorption of new process technologies and the frequency of new product introduction has created, over large areas of Japanese manufacturing industry, a presumption of continuous change, continuous improvement. Ever-changing organizations have to be ever-learning organizational, manned by ever-learning men and women.

One consequence of the close link between training practices and the lifetime employment convention is that the propensity to train is weakest in small firms where that convention is weakest. A high proportion of government interventions are specifically targeted on smaller firms.

The assumption that no man is a complete man, that learning never ends, is reinforced by the weak development of professional qualification systems. And that in turn reflects the relative unimportance of professional organizations, and importance of enploying/producing organizations, as foci of loyalty and identification. One does not stake one's identity on being "fully qualified"—as chemist, optometrist, plumber. One defines oneself, rather, in terms of the organization one belongs to, the jobs one has—hitherto—learned to do, and the jobs one's career track will probably take one to in future.

The state has, however, for the last 30 years, been intimately involved in the certification of skills. The skills certified have, however, for the most part, been narrowly defined and based on specific tests of, say, truck-driving or welding, rather than certificates of competence in a given occupation.

This reflects the fact that their use is more often to provide incentives for skill mastery, and less often to provide labor market signals, than in societies with more active external labor markets.

The efficiency of Japanese manufacturing enterprises derives as much from their recruitment practices as from their training practices. They make sure they get the best.

They are aided in this by the fact that—in contrast to American careers counseling which is about choice of *occupation*—the much less formalized career advice of Japanese teachers centers on the choice of (or the changes of being chosen by) given firms. The "lifetime employment guarantee" is clearly a major reason why this is so.

The balance of state aid to vocational education and training (VET) has, over the years, shifted from pre-employment training "in the market" to the reinforcement and subsidization of employers' efforts to training their employees.

The effect of these state subsidies on large employers' efforts would seem to be marginal; somewhat greater for smaller firms.

The explicit, budgeted expenditure of Japanese employers on their employees' training is not large compared with the expenditures of American firms. The major reliance is on uncosted—and probably uncostable—on-the-job training (OJT]. They are *able* to rely on that because, in learning organizations, every superior is also a teacher.

Training and quality-improvement activities often go hand-in-hand. The writing of a detailed training manual for hitherto undescribed jobs—or the up-grading and clarification of an existing training manual—is sometimes undertaken as a Quality Circle project.

It is, in any case, common for the training manual—or ad hoc guides to what the performers of given jobs need to know—to be written at the worker/supervisor level, not be specialists, and very often at the initiative of the supervisor, in pursuit of his general responsibility for training. This has the advantage of immediacy and cost-saving.

It is also much more common for classroom teaching (of, for example, the theoretical principles needed to back up practical training) to be given by a firm's managers, rather than by outside specialists.

Of the explicitly budgeted-for, off-the-job training expenditures a high proportion, particularly for new employees, is devoted to attitude-molding, "spiritual training."

It is a common assumption that the limitations of OJT are becoming increasingly more apparent as more tasks require the understanding of principles and causal mechanisms which can only be learned from books or videos, or classroom teachers.

The bias towards the book is still strong; the electronic industry has been busy chasing other markets than the training market and the development of the software-writing side of the training industry is still inhibited by the preference firms show for organizing their own training courses. But the electronic training aid does seem now to be taking off.

III. Who Pays? Burden-Sharing Between Individual, Firm, and State

The attempt has been made to estimate the division of the national cost of all forms of vocational education and training between households, private sector firms, and the public sector. The best guess of the estimators was that the division was, roughly, in the ratios 5:1:3, though the estimate is highly sensitive to the estimation of the number of hours the average employee spends in self-study each week, and the cost which is put on it—whether it be costed at normal paid-time cost or at some more realistic opportunity cost. It is also sensitive, though less so, to the estimate of the relation of training budgets to employers' real training costs.

If one concentrates solely on employee training, however, and ignores uncosted self-study, it is clear that employers pay the lion's share. The government has a wide range of subsidy schemes (described in outline in Appendix II) and over the last decade, there has been a clear shift in Ministry of Labor concern from the support of pre-employment "training for stock" to support for the training of employees. What used to be called the Vocational Training Centers and concentrated on the training of 15-year-olds as craftsmen are gradually being transformed into centers for short-course skill-upgrading for those in employment.

Il The total budget expenditure on these and the various subsidy schemes of the Ministry of Labor—134 billion yen in 1989; about $8 per citizen—comes to about a tenth of estimated employers' expenditure. Of this total, 43 percent is absorbed by the maintenance (including staff salaries) of the Skill Training Centers, whereas less than 15 percent (20 billion yen) is spent on promotion (for example, by wage subsidies, which account for 12 billion yen) of employee training within the enterprise. This has less to do with the relative importance attached to the measures involved as with their relative costs and flexibility. The numerous Skill Training Centers, being staffed on the same lifetime employment basis as other major institutions, are inevitably money-guzzlers whether or not they justify their expense. Enterprise training, on the other hand, tends to be relatively cheap; the government contrib-

utes only a limited proportion of the cost, and its contribution targets the SME's whose capacity to organize eligible training programs is limited (and whose employees are in any case usually doing less skilled work).

To what extent have Japanese firms shifted the true costs of training to their workers? In other words, to what extent do employees (through private self-development or other study in their "own time") assume the burden of training that would otherwise be assumed by the company? Essentially, as described above, overall reckonable costs in cash terms are not very large by international standards; and are almost entirely borne by employers; but if time is included in the calculation then the ratio of costs is reversed, since the burden of study in "own time" is largely transferred to employees. The latter do not usually see things that way, however, partly because they are used to having their "own time" introduced upon by the demands of their work, and so of their employer, and partly because self-improvement is generally accepted as manifestly wholesome and intrinsically beneficial—and, in any case, necessary.

In the cost of on-the-job training, the employees bear no burden except perhaps in the sense that it contributes to the total number of hours they must work, which inevitably includes a good deal of their own juniors by seniors could be accurately measured, but most employers might argue that it is more like an unavoidable fixed cost than an investment decision.

As an illustration of the practice of a particularly skill-conscious, training-minded firm, and of the principles underlying that practice, it may be helpful to take as an example the skill-testing system of Nihon Denso, a large (32,000 employees) automobile parts maker which has a highly developed set of in-firm skill evaluation tests which dovetails with the national system. All tests follow the national pattern, comprising a written section and a practical section; tests are at two levels, Grade 1 being the higher one. Test taking is voluntary, and employees are charged for the privilege—4,000 yen and 6,000 yen ($28.50 and $43) for taking Grades 2 and 1, respectively. On the other hand, there is a subsidy of 400 yen ($2.85) per hour (about two-thirds of the legal minimum wage) for time spent preparing for these tests (and indeed for other kinds of private own-time study). Skill test records are taken into account in promotion decisions.

According to Nihon Denso's Personnel Director, the cost of the testing system is approximately: 30 committees on curriculum and test-setting, about 10 members each, meeting for 10 hours a year: 3,000 hours, or roughly 4.5 million yen; the allowances mentioned about for own-time study and practice by test candidates: 90 million yen; on the credit side, a figure of 10 million yen income from test fees should be deducted from these costs.

The 90 million yen spent on compensation for training associated with the tests is only about one-ninth of the total of 800 million yen paid as subsidy for out of hours study, a sum equivalent to 2 million hours of 62 hours per employee.

Clearly 800 million yen is a considerable sum to spend on subsidizing private study. On the other hand, 62 hours a year is a lot of one's own time to spend on the activity necessitated (or rendered desirable) by one's job at a rate well below the minimum wage; but the very fact that the tests are in the principle voluntary—and the fact that a test fee is payable and underlines this—undercuts the likelihood that the time might be begrudged more than the subsidy is welcomed.

Senator BINGAMAN. Thank you very much.

Let me just ask a few questions here.

Mr. Nanto, your description of the keiretsu raises to my mind as to whether the way that those conglomerates traditionally operate, given your statements about how they do not constitute cartels, and they do not as a prima facie matter violate the antitrust laws of Japan, in the area of retail price maintenance, for example, is there a valid concern that, when they operate in this country, when they sell product in this country, they do run the very real risk of violating our antitrust laws and are our antitrust laws sufficient to deal with the difference in competitive behavior that may exist between Japanese firms doing business here and U.S. firms?

Mr. NANTO. If the Japanese behaved in the U.S. in the same way that they behave in Japan, I think there would be many violations of laws, such as retail price maintenance, since that has been very

common in Japan. It is maintained through system rebates and capital provision.

Japanese manufacturers often at the end of the year will give rebates to retailers if they will perform in a certain way. One of the ways is to maintain prices. Another is to not admit competing goods, and so forth.

That probably would be a violation of U.S. antitrust laws. But, the Japanese have learned when they come to the United States that there are certain things they have to do. And they usually hire fairly good legal counsel, so they tend to be more careful about those things here.

Also, the Japanese have found that the best way to distribute their products in the United States is to sell to large retailers, such as Sears, K-Mart and Penny's. And once they're in that distribution system, there is no control to a large extent over pricing and there's much more discounting in the United States than there is in Japan.

One thing in Japan is that, instead of discounting leftover merchandise, retailers are allowed to return it to the manufacturer. They usually prefer that rather than selling it at a discount.

The manufacturer also prefers that, whereas, in the United States, we usually prefer to sell it at an end-of-the-month sale.

Senator BINGAMAN. I guess the sort of follow-on to that is whether the antitrust laws that we have today, which were written with U.S. business practices in mind, whether they are, in your view, adequate to maintain reasonable competition between U.S. firms and Japanese firms that want to do business in our markets; or whether we need to rethink those laws to ensure that that competition is, in fact, fair and that the laws proscribe activities that we are concerned about firms engaging in.

Mr. NANTO. I think the study by the U.S. Federal Trade Commission is going to shed some light on this. I'm not an anti-trust lawyer, so I'm not familiar with all the details of the law. But, clearly, I think we need to look at the behavior of Japanese keiretsu firms in the United States because they tend to operate in ways that they're used to. There also tends to be a fairly large number of decision-makers from Japan in their Japanese subsidiaries here in the United States.

So, there's a large input of Japanese style management and Japanese strategy. That's something we need to look at.

I certainly would not rule out the possibility that we need to adjust our laws to account for the ways that the Japanese normally conduct business in Japan.

Senator BINGAMAN. When will that Federal Trade Commission be done?

Mr. NANTO. I was talking, in preparation for this hearing, to the Federal Trade Commission. They say that they think it will be around December of this year.

Senator BINGAMAN. Mr. Dore, let me ask you. You cited the fact or an estimate that perhaps students in Japan receive as much instruction in 12 years as our students receive in 16.

Are there good studies of the number of hours of instruction that Japanese and other students receive in basic courses? I've had trouble finding that information. I just wonder if you're aware of a rea-

sonably good study that would say how many hours of instruction in mathematics, for example, each students obtains by a certain grade level versus how many hours of instruction an American student would take.

Mr. DORE. I think such comparative studies haven't been done. The Japanese material is very easily available because of course it has a highly centralized educational system. And even in high school, the amount of leeway in the allocation of hours between subjects is very limited; whereas, in much more diversified, decentralized countries like the United States and United Kingdom, one wants surveys to ascertain what actually goes on.

There's been a good deal of such survey work done within the United Kingdom in recent years because we've been thinking very seriously about revamping our system and increasing the degree of centralization. But, I don't know of any explicitly comparative sample.

Senator BINGAMAN. Getting beyond the basic educational system to the teaching of skills and disciplines that are more targeted on the needs of industry, for example, the disciplines and skills needed to operate and install and operate a modern manufacturing facility, how is that accomplished in Japan?

I've read numerous studies about how the Japanese have been much more successful than the U.S. at getting robots into their manufacturing operations, even small manufacturing operations, and generally modernizing their manufacturing activity to a much greater extent than we have.

How is that accomplished? And to what extent does the government play a role in it?

Mr. DORE. I think the overwhelmingly most important means by which it's accomplished is by on-the-job training in factories. I think there's one important characteristic of the Japanese employment system and Japanese systems of evaluation of employees—I mean the evaluations which determine whether they go up the seniority scale a bit faster or a bit slower. One of the key criteria for the evaluation of employees is how good they are at training their subordinates.

And that is not only a matter of foremen and senior workers training junior workers, it's also a matter of junior managers training foremen, and so on. This is particularly important when new production techniques are being brought in because the design engineers and production engineers who have the job of installing, say, a robot also have the job of training—they personally have the job of training—the people who are going to operate them.

So you have trainers who are not professional trainers, but they do know exceedingly well the substantive content of what they're trying to convey to other people.

And in an atmosphere, in a factory, where information is not something you hoard—because it is precisely by being cooperative that you get on, not by monopolizing information, which you can then sell to your superior in a contractual negotiation for a higher salary—in that kind of atmosphere then, the on-the-job learning becomes exceedingly effective. In fact, the surveys show that in terms of actual training budgets and number of days spent in off-

the-job training, Japanese firms don't stand up terribly well in international comparisons.

Senator BINGAMAN. Thank's very much.

Congressman Scheuer.

Representative SCHEUER. Well, I've enjoyed these remarks very, very much. They're very valuable.

Mr. Nanto, let me ask you first, do keiretsus encourage efficiency? If they do, how do you reconcile their monopolistic and protectionist tendencies with the high degree of technological innovation and capital investment in high-tech. How do you account for the efficiency that they have produced in such companies as Mitsubishi, Mitsui, Toyota, NEC—for which they're justly famous?

How do you balance the monopolistic and protectionist elements with the enormous degree to which they've forged ahead with very useful and productive capital investment?

Mr. NANTO. This is one of the enigmas of Japan. When you look at Japan, it appears to be fairly monopolistic. Yet, obviously, the industries are very competitive. The philosophy of the Japanese government has usually been intense competition from within but protection from without. And so, although, in the sixties and even into part of the seventies, there was considerable protection for these industries from without, there was also intense competition within.

So, the fact that you have six major keiretsus that are in every—just about every single industry in Japan and that you have permanent employment, so they intend to stay in those industries, means that those keiretsus have to be competitive with each other. They have to be viable in the long-term.

The measure of competitiveness in Japan usually is the ability to export and to be viable in export markets. It's not just being able to produce, but it's being able to be competitive on an international scale.

The efficiency is driven by this internal competition. So, Mitsubishi is in many cases more worried about Mitsui than it is about an American company.

When Toyota comes into the United States, it's just as worried about what Nissan is doing as what General Motors and Chrysler are doing. In fact, in the United Kingdom, one of the problems is that the competition in certain industries, such as in printers, computer printers, among the Japanese themselves is so intense that, in the process, they almost wipe out the domestic industry.

Representative SCHEUER. I think you have that same phenomenon here in automobiles; according to the automobile consumer magazines in terms of consumer preference, four out of the first five cars, the first four, were all Japanese and the first American car to rank in that treasured list was number five.

So I guess the first four Japanese companies had the most intense competition between themselves.

Mr. NANTO. That's true.

Representative SCHEUER. Ms. Genther, in your paper contributed to the JEC study, did you say that the Japanese government/business relationship facilitated development of the automobile industry by protecting it in its formative stages and then provided for various developmental incentives?

Can you tell us what some of those specific policies, practices, and actions were that promoted the welfare of the Japanese automobile industry?

Ms. GENTHER. The most important protective measures during the 1950s and 1960s were very strict controls on imports of cars, imports of parts and foreign exchange allocation.

For example, during the 1950s, there were four major technical tie-ups with foreign companies, mostly European small car companies. Towards the end of the 1950s, groups like Renault wanted to come into the market in and of themselves, not through these technical tie-ups with the Japanese passenger car industry.

They were prevented from doing so by the government through foreign exchange allocations, primarily.

At the same time, the market was being protected both from foreign capital coming on shore through direct investment and from imports. What I call minimal survival support was provided. For example, foreign exchange would be provided for machine tool imports for the auto industry.

Representative SCHEUER. What was provided?

Ms. GENTHER. Special foreign exchange allocations that other industries were not able to get for foreign machine tools that were needed to upgrade the competitiveness of the auto factories. Loans, in particular, were provided not to the auto-makers but to the auto parts suppliers and to the machinery industry, which supported the competitiveness of the overall passenger car industry.

Representative SCHEUER. I was in Japan a few years ago with I guess a group of Congressmen and Senators that the Japan Foundation brought over there. We had the privilege of meeting with the sons of the founder of Fano, the big robotics company. They related a fascinating story to us about how their father in the early sixties went to MITI and said, "Here's this incredible product I've produced. We ought to be the robotics purveyor for the world."

So, MITI said, "Give us a plan." He came up with a plan, a 15-year plan, I guess it was, which showed that they would not begin to break even until after the tenth year.

So, MITI said, "Go ahead. Stick to the plan. Report to us. Do not worry about your financing. We will arrange it." And MITI did arrange the financing; they went ahead with that plan. And it's just as they had predicted. They lost money for the first 10 years.

The eleventh year, they sort of approached break-even and the twelfth year they broke even, and in the thirteenth year there was an inch of water over that dam. And the fourteenth year, there was a foot of water. And in the fifteenth year, there was a yard of water. And the sixteenth year, there was a ton of water. And, ever since, they have prospered.

Now, that's selecting the next generation's winners, and I guess it means abandoning the losers. In our country, we spend a great deal of money financing Boeing and Chrysler, saving them from defeat.

Which would you say is the most productive use of a company's public and private capital: saving losers and admittedly saving a lot of jobs, or going for the winners? And what is the Japanese through MITI doing today? Are they looking to the next generation of smart computers? Are they looking to pharmaceuticals?

Which industries have they identified as quintessentially important in the third millennium—only nine years away.

And how are they deploying their resources to make sure that they have winners in a decade?

Ms. GENTHER. Japan has never really had to face the question of whether to support declining industries over growing industries because of the high growth of the economy. Obviously, if you're looking long-term, you want to build up a high value-added based economy in products that will be competitive as opposed to those that aren't.

But I think you have to look at products. You can have a declining industry, like textiles, in which there are certain segments that are very internationally competitive and very high-value added, as opposed to the industry overall.

What Japan is doing now in terms—maybe I can go back a minute. I think the example you cited is excellent in terms of it was the private sector which came up with the policy idea which then they developed in concert with the government in terms of an interactive relationship and in terms of an interactive decision on what to do.

It wasn't MITI going and saying: You will develop robotics and going to the government for aid.

What's happening now is a little bit different because it's very hard to choose winners when you're at the cutting edge. Back in the 1960s, they could look to the U.S. They could look to Europe and see what industries they should go into. It's also harder now because the international environment has changed. You can no longer do things like control foreign exchange.

So what I think MITI is doing now is stressing high-tech industries, such as information technologies, fuzzy logic and opto-computing are two that we've heard lately. For manufacturing systems overall like robotics, what they're doing is providing specialized government procurement which becomes the basis of a lot of U.S. trade complaints in terms of protecting the industry and giving them a guaranteed market right at the beginning.

Support for research and development is much stronger than it was in the past, whether it be through consortia or special subsidies or tax write-offs. And continued support, as Dr. Dore pointed out, for a highly educated work force.

Representative SCHEUER. Thank you, Ms. Genther.

Mr. Dore, you told us a lot. You talked a great deal about the superior level of training, skills training. And not only skills training but the ability of the Japanese worker to process information, to make value judgments and decisions on the job which sum up what's going on out there, which is terribly important.

And American workers don't seem to have that to the extent that the Japanese workers do. This Committee has had a number of witnesses and panels and days of hearings on the question of our non-college-bound youth comparing our country's way of treating college graduates and preparing them with skills that are relatively current, how we ease that way from the world of school to the world of work in comparison to how countries do that abroad, including Japan. But, Singapore, Hong Kong and such countries as Scotland, West Germany. They do superb work all over Europe.

Can you distill out of the lessons that you think we ought to be learning about the way Japanese society perceives its non-college-bound youth?

I'm not talking about production of mathematicians, scientists, engineers and post-doctoral fellows. I'm talking about non-college-bound youth who will man the factories, the production facilities.

What is it that the Japanese do that we don't do? Or, what are the things that we are not doing that we should be doing? Are there some things we ought to stop doing and invest our capital and our limited resources in other areas?

What lessons do we have to learn from Japan that are translatable to American society and that would be acceptable and attractive here and could be applied here on how they are dealing with their non-college-bound youth?

Mr. DORE. I suppose the most obviously transferable feature of the Japanese system is the inter-relationship between how people see their future and the recruitment methods of major employers in society. I spoke of the screening and labeling and certification process and how important that was. It's known to any class of graduating high school children that a number of companies are going to come to the teacher and they're going to ask the teacher to recommend the best boys in the class, the best girls in the class. And they know that the teacher is going to recommend them on the basis of academic performance, on the basis of how well they're doing in school.

And they know also that the teacher is going to send what he considers to be his best pupil to what is generally considered to be the best firm, and the second-level pupils to the second-level firms, and so on.

That gives children a very strong incentive to do well in academic terms. So, the way in which the recruitment practices feed back into the motivation of people to learn in school I think is tremendously important.

Representative SCHEUER. In other words, what you are saying is that Japanese high schools and vocational schools, would not and simply give students a hunting license to go find a job once they finish their course of study? There is a very close interaction between the world of work and the world of school? That through informal mechanisms, informal ongoing relationships between firms and schools, kids are eased into a job in the private sector?

Mr. DORE. That's exactly right.

Representative SCHEUER. I suppose there is a major lesson for us to learn from that.

Mr. DORE. I think there is a major lesson, but you also have to be aware of the consequences, the consequences which you may not be so happy with. It does mean putting an emphasis on that single measurable criterion of academic ability, measurable school learning ability in determining people's futures.

Now, this is more feasible in Japan than it would be in this country because authority patterns in Japan are so much easier to manage. You see, it's much more necessary that a manager is bright than that he's got a commanding personality; whereas, the balance between these qualities, the intellectual and non-intellectual qualities, I think has to be different in our society.

So don't think that transferring the Japanese identification and labeling system will have the same effect.

It also means, of course, that the educational competition affects almost everyone. It is not just to get into one of the elite schools that the competition exists; the competition is also in order to get into a fourth rate school rather than be relegated to a fifth-rate school. And the competition is to be in the second-best pupil in the class rather than the third-best pupil in the class.

And the intensity of that competition for everybody—which is manifested in the cram schools which children are sent to after they've done their six hours of regular school—the Japanese themselves are thinking, has the effect of distorting personalities.

Representative SCHEUER. There is a high suicide rate among kids. Still, I suppose there is a lesson to be learned, and that lesson could be integrated into our culture. There could be a focus on the whole person as well as their strictly academic record. I would think that would be integratible.

But, at least the principal thing is that in Japanese society a kid knows that, if he performs well at school, he will have a reasonable expectation of ending up with a good job. There is a bridge, a structured bridge between the world of school and the world of work.

To me, that's a terribly important lesson for us to learn.

Mr. DORE. And I would make just one comment on your suggestion about the "whole person." Of course, one can give certificates that are more broadly based and take account of other qualities. The problem is, as soon as one does this—we've been experimenting on this line in Britain for the last 10 years—the subjective judgments of teachers enter in.

The thing about what the Japanese do is that it is absolutely objective.

Representative SCHEUER. It's just marks. The bottom line. Examination results.

Mr. DORE. And it is the insistence by Japanese parents on a level playing field—that the competition should be fair—which keeps the system that way.

And also that is the insistence which keeps the system highly centralized. Because people move; and if your child moves from a school with one curriculum to a school with another curriculum, he's disadvantaged. So, if you have a centralized national curriculum, in all this movement, everybody is on a level, and competing in the only game that counts on equal terms.

That's seen as terribly important by Japanese parents.

Representative SCHEUER. Thank you, Mr. Chairman.

Representative HAMILTON (presiding). First of all, I want to express my appreciation to Senator Bingaman for taking over for me. I was not able to be here early on.

I also want to thank all of you for your excellent statements, particularly Dr. Genther and Dr. Nanto. I want to express my appreciation for your contribution to the volume that is being printed now.

And as I understand, it will be released in a few weeks, on Japan's Economic Challenge. Both of you contributed to that and it helped make it an excellent volume. I'm looking forward to seeing it myself.

And I think it will contribute substantially to our understanding of Japan and its economic challenge.

I'm not sure if I really know where I want to begin. I want to get your assessment of the Japanese economic challenge. You all are experts on Japan's economy in one way or the other.

If you go out here and talk to Americans in general, they think Japan's economy is 10 feet high, and maybe we're two or three feet high. And if you ask Americans generally about what they worry about, they worry less about the Soviet challenge and more about the Japanese challenge.

How good is this economy of Japan? How formidable a competitor is it? Are they going to just ride over us roughshod in the years ahead and sink us in one industry right after another? What are their weaknesses? What are their strengths? What are we faced with in the Japanese economic challenge anyway?

How serious is it? Do you lie awake at nights thinking about it? [Laughter.]

Representative HAMILTON. Or don't you, and should you? And should we? Just give me your impressions of this Japanese economic challenge?

Mr. NANTO. I think the competition from Japan and from other countries of the world has really changed the American economy. I like to speak of the international trade revolution. You look at the United States 20 years ago and compare it with what is happening today, there really has been a change similar to a revolution, like the Industrial Revolution. It has changed the way we operate our businesses, in what we perceive as our competition, how we define "competition", and how we produce products.

It has changed many strategies of business. In fact, there are many who say that the crucible of competition has moved from North America and Europe to Japan, that many of the new products, especially in consumer electronics, are actually appearing in Japan first.

So, if you wait for a competitor's product to arrive in the United States and a Japanese product to arrive in the United States, it's too late, because this product has already been tested in Japan. We can think of CD players and some of the new high-tech electronic toys that have come out of Japan as a good example of this.

We also see it in mass-produced cars. There are some features of Japanese mass-produced cars that have heretofore appeared in very special models that were tested first in Japan before they came to the United States.

So, in terms of the Japanese economic challenge for American business, I think every American business now, no matter how small, needs to have an Asian or a Japanese strategy. Somewhere in their planning, they have to account for what is happening in Japan. They have to be gathering intelligence about what is happening in Japan.

I was surprised. We were having hearings a number of years ago on the copyright law. There were people who make calendars in little towns, where normally what they do is just put the local company's name on the calendar, who were saying that there were Japanese printers coming into these small midwestern towns want-

ing to sell calendars. Virtually, every industry is being affected by Japanese competition.

Now, the Japanese are certainly not invincible. There are weak industries in Japan. There are industries that fail. There are nonproductive industries. The whole agricultural sector in Japan is fairly unproductive.

When you grow rice on a plot of land that is the size of a lawn in the United States, you know it can't be very productive in terms of labor efficiency. It is productive in terms of land efficiency (yield per acre).

The distribution system is fairly unproductive, and so there are areas in Japan that certainly need improvement.

Will Japanese industries ride roughshod over American industries?

I think the tendency is for the strong industries, the strong businesses in the United States, in North America, in Europe and Japan, to link up with one another, to form these consortia of industries now.

So what we're seeing more nowadays, instead of having American industries versus Japanese industries, you are seeing linkups of Boeing and Mitsubishi, of Mitsubishi and Daimler-Benz.

Representative HAMILTON. Is that on the theory that:

If you can't beat 'em, you join 'em?

Mr. NANTO. That's right. The other problem is that technological change is so rapid and the tastes of the world are becoming so similar that, in order to become competitive in the three major markets in the world, you have to have a presence there.

And there are very few companies large enough to have a strong presence in every large market in the world, and so you link up. It's a way that you can also perform R&D and product development more efficiently.

How serious is the Japanese challenge?

As we see with what's happening in Japan now with the stock market decline, with the decline in real estate, with some of the problems that cross-shareholding has brought about that there are weakesses. This is because Japanese companies have so much cross-shareholding, when the stock market falls, it hurts everybody. There's a rebound effect. It not only hurts your stock, but it hurts you indirectly because you hold the stocks of other companies whose stocks are falling.

So there certainly are weaknesses there. But, the Japanese somehow seem to be able to overcome the major disadvantages of being an island nation, isolated from the rest of the world, being very crowded and having a lack of natural resources and being dependent on foreign oil almost 100 percent. They seem to have organized themselves in a way that they can overcome these problems and still be quite competitive in the world.

Representative HAMILTON. Do you think Japan will be the number one economy in the world in the future?

Mr. NANTO. I personally do not think so unless the exchange rate goes to $360 to 1 yen. In exchange rate value, certainly the Japanese economy is going to become very large and in another 10 years, it probably will be something about 80 percent the size of the U.S.

Representative HAMILTON. What's the percentage now?

Mr. NANTO. It's about half.

Representative HAMILTON. I want to hear from the other witnesses on this general impression.

Ms. GENTHER. I think I would second everything that Dick Nanto has said from both my experience working at Commerce advising industry and seeing what's happening to U.S. manufacturing.

Japan certainly is a challenge and to not take it seriously is to almost fall into the trap that Japan did not fall into in the 1950s, in the 1960s, when it did not ignore that competitiveness is global competitiveness, not domestic competitiveness.

To me, that factor almost more than anything else is what brought Japan together in terms of realizing that competition and cooperation are not mutually exclusive in making a competitive economy and a competitive company.

In terms of weaknesses, one thing that we're seeing lately is an increased emphasis on basic R&D in Japan. There's a strong movement that rather than just buying technology they realize they have to develop their own.

Recently, some of the international research that have been proposed by the government of Japan and by others have a very strong emphasis on accessing EC and U.S. basic R&D because they're not sure how long it will take to build their infrastructure, do it themselves, and whether they'll be able to do so.

When you get to be a leading edge country in terms of technology, I think that is a weakness, when it hasn't been for Japan before.

The other thing is I think the U.S. can, as long as it recognizes that challenge, meet the challenge. A lot of the mystique about Japan, some of their practices and quality circles, and things like that, if we look back, were originally American practices from the 1950s that they just took and adopted better and improved upon. They're not uniquely culturally Japanese.

And probably the final factor that I see is that in responding to the challenge, we have to stop being reactive and do things like accept that you build your own market. You go out like the printers and build a market. You don't just accept and react and see what happens to your product.

You have both technology pull and market pull, —market push and technology push.

Representative SCHEUER. In terms of looking for a market for calendars, they're overlooking one of the most lucrative markets in the world for calendars, which is the United States Congress.

[Laughter.]

Representative HAMILTON. Are you, Dr. Genther, worried about the Japanese economic challenge?

Ms. GENTHER. I'm worried that we need to start focusing on it more than we focused on it in the past. Everybody talks about it but doesn't carry through in pragmatic action.

Representative HAMILTON. Do you think we're kind of lax?

Ms. GENTHER. Yes.

Representative HAMILTON. American business? Government? Lax?

Ms. GENTHER. Both.

Representative HAMILTON. So we've got a very serious economic challenge out there in your view?

Do you agree with that, Dr. Nanto?

Mr. NANTO. Yes.

Representative HAMILTON. And it's one that we are not responding to as vigorously as we should?

Is that a fair summary? Dr. Dore, how do you size up this Japanese economic challenge?

Mr. DORE. Mr. Chairman, I'm old enough to remember the fifties, when it was we Europeans decided that we couldn't beat you and decided that we had to join you. That was the time when we sent productivity teams to study how the United States superior productive performance was achieved. And it's the time—1955, was the year in which the Japanese created the Productivity Council for the express purpose of sending productivity teams to the United States, at that time to learn how to do things.

Then, there was absolutely no doubt that the United States economy was the strongest economy in the world; in almost any field of manufacturing, the United States could wipe out any competitor it chose to take on. And the United States was also a high saver. The consequences were trade surpluses, which resulted in heavy United States investment and heavy investment by U.S. firms in Europe and Latin America, which had the effect of diffusing the American quality of technology around the world. That was very good for the rest of us.

I see very much the same process happening now with Japan playing the role of the United States in the 1950s. You see, it seems to me——

Representative HAMILTON. You wouldn't say that Japan was the strongest economy in the world today, would you?

Mr. DORE. I would say that, in any given market, Japanese firms are likely to have the competitive edge over the firms of any other country. In terms of the total strength of the economy, of course, obviously not.

Representative SCHEUER. Will the witness yield briefly?

What we just heard from the panel is that the Japanese economy is half of the U.S. economy. And that means, with 110 million people compared to 250 people, they are doing far better than we are in terms of per capita GNP. And when you think of the Japanese with far less than half of our population equaling, accounting for 80 percent of our GNP, that is a truly awesome picture. And that's enough to send chills up and down our spine.

Mr. DORE. In those per capita production terms, Kuwait, when there was a Kuwait was rather better off than either of us. But, in terms of ability to capture world market share, there's no doubt that the major strength of the Japanese economy is spread across the board, which I think comes from the employment system, which I think comes from the work ethic, and which I think also comes from the capacity for long-term investment that goes with the nature of Japanese capitalism.

I think these inevitably are going to give it a productive edge, a competitive edge, which should allow it over the next 10–15 years—until they begin to slow down and we start worrying about China—it should allow them to play very much the same role, running con-

sistent surpluses and investing increasingly abroad in manufacturing. And that will have a tremendous spread effect in taking their technology to other countries.

And, of course, there is the point that my colleagues have already made and the point that's made more dramatically by Robert Reich when he says—Who is us and who is them? When we say we should be afraid of them—I think it's true for Britain, or used to be true before the recent flight from the Tokyo capital market—that British pension funds, particularly, and investment trusts owned more of Japanese manufacturing than the share of Japanese corporations in the manufacturing output of the United Kingdom. Not only through the technical tie-ups that we mentioned, but that kind of inter-mixing and the free international flow of capital is going to mean that it matters less to our standards of living—whatever it does for our national pride, it matters less to our standard of living—which is the dominant economy of the world.

Representative HAMILTON. Mr. Scheuer.

Representative SCHEUER. All of this discussion in the last 10 minutes has been in response to the Chairman's question: How do you perceive the Japanese economy?

I'd like to ask a question that's perhaps a foolish question, asking you to distill from all of your experience the lessons that we ought to learn in regard to this country's government, business, labor, and capital markets. What are the lessons we can learn from the Japanese that we should crank into our public policy discussions and public policy decisions right here on Capitol Hill?

That is what these Congressional hearings are for, to advise the Congress on improved public policy. There are a lot of things about Japan that we cannot emulate, that are not applicable, that are not appropriate, that are not germane to us. But there are a lot of lessons that are.

You mentioned, all of you have mentioned, some of them. Can you just sum up in two or three minutes the key lessons that we should learn and the key decisions that we ought to be making differently than we're making them now, based on the Japanese experience?

Ms. GENTHER. To be succinct, I think there are three lessons.

The first is competition is global, it's not domestic. And you compete by being proactive, not reactive.

The primary lesson I think for public policy is that, if you ignore the input of business or you ignore the input of government, you'll miss a lot of good ideas. The only way to get good ideas and good public policy is to work together and to accept the role of each other in building a public policy.

Representative SCHEUER. You would include the input of labor?

Ms. GENTHER. Yes. Labor, academia, universities.

Representative SCHEUER. Thank you.

Mr. Nanto.

Mr. NANTO. I think one of the lessons that the Japanese have taught us, at least what they have found to be true in their case, is that industries are very important, that the viability of industries is very important, and that a relative competitive advantage can be created.

There is nothing that would indicate, for example, that automobiles could be a competitive industry if it's located in Japan. Seventy-five percent of the country is mountains. There are hardly any roads. There's just nothing that indicates that that should be true. But, that advantage can be created.

Another is that the government can play a very important role in sunrise and sunset industries. Right now, the Japanese, in following up what Dr. Genther said, seem to be focusing on the two ends of the life cycle of industries, the rising industries, which they realize they must have for tomorrow, and to some extent, the declining industries in the sense that they're helping them to adjust to the fact that they are no longer competitive in international markets.

If we are in this country to focus on industries, perhaps we could channel our resources to those two ends of the spectrum rather than to the middle. We have a tendency because of our sense of fairness and equity, I think, to define rules based programs, such as an R&D tax credit that applies to everyone who can meet certain rules.

Because of that, it becomes very expensive because many, many people and many industries can meet the rules even if they don't need the R&D subsidy. Perhaps we could channel more scarce resources into areas that are more important.

Representative SCHEUER. Thank you.

I suppose you could call our tax structure up until recently a structure that wasn't focused to achieve those gains. We gave enormous tax incentives and tax benefits to people who built hotels, office buildings and apartment houses and shopping centers. My life before coming to Congress was essentially as a large-scale developer and the greatest incentive I had for attracting investors was to say:

From the tax benefits you'll achieve from depreciation and deduction during the construction period, you'll have your entire investment out before this project is finished.

And in the last decades, we've had enormous growth of these real estate developments of all kinds—offices, apartments, shopping centers and the like. But, the businesses that made things to sell in global commerce had a heck of a hard time and didn't have anything like the financial incentives for investing capital. The research and development for new plant and equipment we starved the very industries on which our competitive economy had to rely in global competition. And we gave this plethora of benefits to industry that weren't producing anything in terms of our global competitiveness. Maybe nicer hotels and nicer apartment houses, but that's not the real goal of our society.

And I suppose you're saying that should be reversed and we should provide more incentives for research and development in new plant and equipment, and investments in those things for industry that produces things that we hope to sell in global commerce.

Am I putting words in your mouth?

Ms. GENTHER. No. I was going to say I think you have to stress manufacturing more than we've done.

Representative HAMILTON. Dr. Dore.

Mr. DORE. I would agree with that. I think tax breaks for long-term investment, either in R&D or in training, are the kinds of devices that one ought to be thinking of because it is precisely in this dimension of the time horizon of investment that the Japanese differ from us in the U.K and the United States. It is a difference which of course becomes more and more important the more complex the technology which is embodied in the product we previously used.

But, I think also one needs to go further because long-term investment isn't only a matter of a tax break this year or next year or the year after. It's also a matter of the mind set of the people who are taking the decisions and I think we have to think of changes in personnel systems and managerial remuneration systems, and so on, to encourage more managers to have a longer-term commitment to their enterprise—and to their employees, too; we've got to do the training; we've got to do the hard job of motivating people in mid-life to retrain themselves.

So I would highlight the employment system to encourage that kind of long-term commitment and also changes in the financial structure to encourage the long-term commitment of shareholders so that they too can contribute to the enterprise.

Representative SCHEUER. Last question.

Should our country have an industrial policy to encourage the development and nourish and nurture the development, for example, of the next generation of smart computers of high-definition television so that we can compete one day with the Japanese who are miles ahead of us?

Should that be our policy? Or, should we simply let the competitive market out there guide the investment of talent and of dollars? Should we let the market decide?

Mr. DORE. I have no doubt whatever that industrial policies of the kind you're talking about pay off, but they only pay off on the conditions that Ms. Genther was talking about. And that is to say where you do have—because it's only the leading firms in an industry that have the technical capacity to make these commitments—provided you do have enough of a consensus and the ability to cooperate among the firms, the leading firms in the industry, to identify the technologies that are just over the horizon and that are going to count, because they and not government officials are the only people in a position to identify those technologies and to set up the research program in conjunction with civil service.

Representative SCHEUER. Let me follow up with a question. We have an antitrust statute that dates back to the last decade of the last century, almost precisely 100 years ago, it was passed in the shadow of the deprivations of the Rockefellers and other so-called robber barons, as we've written about them, to preserve competition and fairness.

Now, when you talk about producing for global competition as you do, there is no abstract reason why cars should be produced in Tokyo to be distributed around the world. There's nothing intrinsic about that country, which is 75 percent mountains and has a scarcity natural resources in the other 25 percent, that would indicate that their market share should be penetrating our production of automobiles inexorably.

So, the question then is are our antitrust laws, like the Sherman Antitrust law of a century ago, inconsistent with the realities of today's goals for us? Today it is not really the importance of whether we have four automobile companies or three automobile companies but, indeed, whether we might not want to engage in a kind of talent-sharing, capital-sharing, large-scale plant and equipment-sharing that will enable us to produce one successful car in global commerce.

That may be the question that will be facing us five, ten, or fifteen years down the road, with this inexorable penetration of the market?

How do we stop that and start penetrating their markets instead? Do we need some basic agonizing reappraisal of those antitrust statutes of a century ago? Is it time for us to think about them and figure out the degree to which they do inhibit a larger collectivity from producing a global car that will whip the competition around the world?

We have recently made changes. Companies now can share research. Do we need to go farther than that? Do we need to enable them to share development?

Mr. DORE. I think the extent to which that makes sense depends very much on how far you are, in fact, living in a free trade world. As long as you have a tendency toward trading blocks and as long as imports in your industry are restricted, then of course the old Sherman Act arguments for preventing monopolies internally still hold.

But, if you do have free and open trading systems, then I think you're right. Moving to greater freedom for collaboration in development research makes sense.

Ms. GENTHER. Just briefly, I think the passage of the National Cooperative Research Act in 1986 was a movement in the right direction. For generic technologies and at a stage of technology development where companies are willing to collaborate, there's an added incentive to be able to do this.

There's other legislation pending now to push it further down the technology line, and that deserves to be looked at.

Mr. NANTO. I think the tendency in terms of sharing production and development actually is moving to what I mentioned before about the consortia of businesses. I think the Ford Escort is a good example of this. The new Ford Escort just came out. This was the result of a joint Mazda and Ford engineering effort. It was interesting to read about the sort of knock-down, drag-out battles that went on between the Mazda engineers and the Ford engineers to try to get some of the Japanese type features into this car.

We will see what the market says about the result, but most of the early indications are that you're seeing something that is very different from the previous products that have been put out by Ford and that this is a joint designed product. That seems to be the wave of the future.

We also see joint production in the Ford Probe with Mazda and with GM and Toyota. There is more of this, but it's more along company lines rather than international lines.

So it's becoming very hard to define what is an American company because of these linkages. And I think the discussions in one of

the Science Committees on R&D tax credits about what is an American company were very instructive. It turns out that companies like Phillips in the way they operate in the United States can be as much or more of an American company than a company like even Zenith, which is an American company, when measured in terms of where do they do their R&D, where do they do their production and how committed are they to the U.S. market?

Representative SCHEUER. If you look at the pattern between cooperative ventures between Japanese and American automobile producers, for example, am I looking unfairly at them when I perceive that in many of these partnerships between the Japanese and the American automobile producers, the Japanese provide the sophisticated computer-driven parts, and the Japanese design the plant subject to the American partner's approval, while the American partner produces the doors, the hood, the trunk, the transmission, and the raw materials. In effect, there is a bit of a colonial relationship here. America provides the unskilled labor and the raw materials and the Japanese provide the sophisticated know-how and the high tech parts.

If that is an unfair analysis, please tell me.

Mr. NANTO. I think, clearly, one of the reasons for the initial joint ventures was to get Japanese technology in terms of building small cars. The Japanese are very good at building small cars. This is something that the American producers wanted to learn. If you look at the Japanese subsidiaries, such as the Honda plant, the Toyota plant, it's very clear that initially most of the critical components did come from Japan. And that's natural, because there just weren't suppliers that could make a Honda engine in the United States.

But, gradually, these companies have tried to increase, partly because of political pressure, tried to increase their American content. So we see, for example, in the Toyota plant in Kentucky, they have now added an engine plant. And this initially was on the drawing boards, but it wasn't there at first because it was something they would do if the demand was sufficient.

But, the Japanese now have a certain technology that's wanted. And so it's natural that they provide the technology and some of the key parts. But, gradually, if you look at things like design, that is coming to the United States. Most of the Japanese companies now design their cars in California or in Europe.

Representative SCHEUER. Let me ask one more question. I am going to have to leave in about two minutes, but the Chairman is coming back. I am not going to adjourn the hearing in the hope that you will talk for the record even while there is no Congressman here.

[Laughter.]

Representative SCHEUER. Clyde Prestowitz has maintained that Japan's economic system favors producers by channeling of the capital to the aid and nurture of the next decade's winners, and so forth; whereas, our economy favors consumers, exalt's the sovereignty of consumers.

In other words, Japan is playing a bit of a different game.

Do you agree with Clyde Prestowitz? What are the implications for U.S. efforts to open Japanese markets, and to otherwise compete more successfully with Japan?

Ms. GENTHER. The Japanese system, I believe, has favored producers over consumers and has helped to build a strong manufacturing base post-War.

I think though it would be a mistake, as I stated in my testimony, I think Japan is under some of the same pressures we were in during the 1960s to be a little bit more responsive to consumers than it was in the past. And that's changing.

Representative SCHEUER. It is changing: the Japanese housewife pays five times the world price for rice, although I heard a moment ago from Mr. Nanto that the Japanese system uses land very efficiently.

Well, Mr. Nanto, if the Japanese permitted rice from Thailand to be imported into their country and rice from America, they would soon cut the price of rice by four-fifths, then land wouldn't be all that valuable for rice production. They could use that land around Tokyo for apartment houses for workers, executives, or anyone else.

So that the average Japanese executive or worker would not have to travel an hour and a half to two hours a day each way to reach his home. It seems to me that land is inefficiently used. It should be used for housing, rather than for this very protected and not very productive agricultural sector; namely, rice production. Thailand stands ready to practically bury Japan in an inundation of rice—excellent rice—as do our rice farmers.

Representative SCHEUER. I am afraid I am going to have to declare a 5-minute recess until the Chairman comes back. We will then carry on and conclude this hearing.

I have enjoyed it very, very much and I'm terribly grateful to you.

[Recess.]

Representative HAMILTON. The Joint Economic Committee will resume its sitting.

When we talk about Japanese economic success, I think many of us tend to think in the first instance of manufacturing success, but it's really much broader than that, isn't it? I mean, in banking services, they've been quite successful in those fields as well.

Is that correct?

Mr. DORE. I think, in banking, they have indeed been very successful. But, how far that is related to the very specially cheap availability of capital in Japan rather than to superior banking skills, I've never been sure.

I think the fact that banks have been able to satisfy their own shareholders, while paying dividends at much lower rates than here is important.

Representative HAMILTON. When you talk about the Japanese economic challenge, do you think primarily in terms of manufacturing?

Mr. DORE. Absolutely.

Representative HAMILTON. All of you think pretty much in terms of manufacturing. How would you describe for a layman now the key to Japanese economic success, just in a sentence or two?

If I heard you correctly a moment ago, Dr. Dore, you were saying that the key to its success was the employment system, the work ethic and investment.

Did I quote you correctly?

Mr. DORE. Yes.

Representative HAMILTON. Dr. Genther, I gather, from your statement, you think of it more in terms of this Japanese government/business relationship as the key to their success.

Why is it this economy has been so remarkably successful? What is the key to it?

Ms. GENTHER. I think there are many keys. Government business relations is what I've studied. And one factor that I've focused on. But, I think, to maybe be more generic than government/business relationships, I think the key is its ability to cooperate and compete at the same time.

Representative HAMILTON. And that's related to Dr. Dore's comment about the educational system and how it emphasizes cooperation.

Dr. Nanto, how do you feel about it? What's the key to the Japanese system?

Mr. NANTO. I see Japanese business as operating in certain environments, and just about every one of these environments has been fairly favorable to the development of production.

One is the macroeconomic environment, the fact that it's very stable. They have had very few recessions for most of the fifties, sixties and into the seventies. They have very high growth rates.

So it was very difficult to make a mistake. You could always create too much capacity with the knowledge that, eventually, the economy would catch up with your capacity.

And so there is a tremendous impetus in Japanese businesses to grow. The emphasis was always on growth and on market share.

Representative HAMILTON. But, the Japanese government has been very successful in conducting fiscal and monetary policy, is that right? And there's good coordination between the two?

Mr. NANTO. Yes.

Representative HAMILTON. They run big government deficits, don't they?

Mr. NANTO. They have, yes. In the latter part of the 1980s, however, they decided to try to eliminate the government deficit. Now they're down to the point where the only activities that are financed through deficit spending are the capital improvements that the government undertakes.

Representative HAMILTON. What are the weaknesses of the Japanese economy? You mentioned a moment ago agriculture. Consumers are really the guy that take it on the chin in the Japanese economy.

Mr. NANTO. The consumers in terms of high prices.

Representative HAMILTON. That's a pretty important matter to consumers.

Mr. NANTO. Yes. However, in Japan, one of the oddities about the Japanese is that many are willing to pay the high prices if they have the service to go with it. And so that is what Japanese retailers tend to emphasize. When you go to Japanese department stores and you buy something, it's wrapped very carefully and there's

only one piece of tape that's put on it; in the little mom and pop stores around the neighborhood, they have very fresh vegetables, and things like that.

Representative HAMILTON. Are there very many consumer advocates in Japan?

Mr. NANTO. There is a consumer group in Japan.

Representative HAMILTON. Have they got a lot of Ralph Naders over there?

Mr. NANTO. However, I once asked the Japanese why the consumers never complain about the high price of food. And my Japanese friend said:

"I think it's because the Japanese cooperatives, the agricultural cooperatives, provide money to the consumer groups. In response to this, they never complain about the high price of rice."

Representative HAMILTON. But, this whole system really doesn't pay very much attention to the consumer. It pays much more attention to things like market share.

Mr. NANTO. That's right.

Representative HAMILTON. Is that correct?

Mr. DORE. You can't be concerned about market share and not be concerned about the consumer. I think what Dr. Nanto said, the fact that consumers are looking for quality and that when, particularly in those markets where there is some kind of price leadership and not much price competition, it is in terms of quality and service to the consumer that companies are competing. And they really are competing.

Representative HAMILTON. I was interested in your comments, in your statement, about the development—I'm not quite sure how you phrased it—of conscience in the school system. And the moral basis for education.

What's the philosophical base for that?

Mr. DORE. It's something there in society, not just in the schools.

Representative HAMILTON. Is it a religious base?

Mr. DORE. If you call Confucianism a religion, it's religious. But, the characteristic of the dominant ethic of Japan for the last three centuries, since the revival of Confucianism in the 17th century, the characteristic of that ethic is that it's been a secular one. It does not appeal to any kind of transcendental legitimation.

Representative HAMILTON. The educational system doesn't hesitate to inculcate moral values?

Mr. DORE. Until 1945, it did so very explicitly, telling people exactly what was right and what was wrong. They don't do that any more. They do have ethics courses. And the ethics courses are designed to make people think about moral problems.

Representative HAMILTON. In the business schools, do they have ethics courses?

Mr. DORE. They don't have business schools.

Representative HAMILTON. They don't have business schools? Maybe, that's the key to their success.

[Laughter.]

Representative HAMILTON. Their value system is based on what?

Mr. DORE. It's based on a belief that certain qualities of personal relationships in particular ought to be preserved.

Representative HAMILTON. Like fairness?

Mr. DORE. True. Like being honest. Like treating people fairly and treating them as ends and not as means. And it means also a kind of general stance in life that we've come on this planet not primarily to pursue happiness but to fulfill our duties. That is essentially what the Protestant Ethic was about. That's Calvinism.

Representative HAMILTON. Duty to whom?

Mr. DORE. Duty to society, primarily. Duty to one's fellow man. A duty which is in concrete terms defined by the place in society that you happen to be in.

Representative HAMILTON. If I heard you correctly earlier, you said that, if the companies had a tough time, the managers cut their salaries first.

Mr. DORE. Yes.

Representative HAMILTON. And they cut those salaries before they cut the salaries of the blue collar, what we would call the blue collar workers.

Is that right?

Mr. DORE. Yes, and before they dismissed them.

Representative HAMILTON. And before they dismissed them. And if I recall correctly, the gap between the manager's salary and the worker's salary is much, much less than it is in the American system?

Mr. DORE. Absolutely.

Representative HAMILTON. Does that have anything to do with the success of the operation?

Mr. DORE. A great deal. It is one of the factors like the lifetime employment system and also like the systems of consultation, and the general style of authority which reinforces the sense of belonging to the group, to the corporation.

Representative HAMILTON. We really do it at the opposite end, don't we? The company slows down, they lay off the blue collar workers. That's the first thing that happens.

Mr. DORE. Right.

Representative HAMILTON. And the gap between the manager's salary and the workers' salary out there in the shop is what? Ten, fifteen, twenty 20s. Take a big company, like a big automobile company. What would be the gap between the average worker out there, or maybe a highly skilled worker and the head guy?

Mr. DORE. Seven or eight times I think is the figure I've seen. I haven't checked it out.

Representative HAMILTON. In the United States, do you know what that would be?

Mr. DORE. A multiple of Double and sometimes in certain notorious cases, triple figures.

Representative HAMILTON. Is the lifetime employment system weakening in Japan or strengthening?

Mr. DORE. My impression is that, while in certain sectors—say, engineers engaged in R&D who are often poached from firm to firm, but often by agreement between the firms, to support diversification schemes, and in the financial sector—there's been a very considerable increase in mobility. The financial sector particularly in the mid-eighties, but less so now.

But, generally speaking, I see no signs of breakdown in the lifetime employment system.

Representative HAMILTON. Is the lifetime employment system largely related to the big companies? What about the fellow who works as a clerk in the drugstore or the small grocery store? Do they have a lifetime employment system?

Mr. DORE. In small retail businesses, probably not. But, as you go down the firm-size scale, the diffusion of lifetime employment practices characterized by low turnover and seniority wages, has got more and more entrenched at smaller sizes, particularly within manufacturing.

So that even a 50-employee manufacturing firm is likely to have the same employment system as a Hitachi or Toyota.

Representative HAMILTON. If a company goes bankrupt or if a company just isn't making any money, they don't lay off workers, or do they?

Mr. DORE. The order is, first to cut recruitment of everything except new cohorts of school leavers.

The second thing is cut back overtime. The next best thing, if you're a big firm at the top of the keiretsu, you siphon off some of your surplus employees to your dependent suppliers, and so forth.

And the next thing, if you're absolutely desperate, you offer a voluntary early retirement plan, the voluntariness of which is sometimes suspect.

Representative HAMILTON. But, you don't read headlines in the business pages about big keiretsus laying off a thousand people. We picked up the paper this morning and we heard about layoffs at Marriott, for example. You don't read that?

Mr. DORE. What the steel firms did was not to lay off people but to lend two or three thousand workers, say, to an automobile plant. They remained on the steel company's books and they got a wage that was determined by the steel company firm, but they were rotated for a year at a time to work for an automobile company.

Representative HAMILTON. You think pretty highly of the Japanese education system.

Mr. DORE. Yes.

Representative HAMILTON. What's the biggest weakness of it?

Mr. DORE. The biggest failure is that it produces people with highly developed intellectual faculties and also the moral qualities we've talked about, but—and this is what the Japanese themselves are worried about—not much creativity, not much imagination, not much individuality.

And, of course, the big Japanese worry about the economy is this lack of originality and creativity is going in the long run, to lead to stagnation. It is going to be a cause for a decline in their competitive edge.

Representative HAMILTON. Do you think that's true?

Mr. DORE. No, I don't, actually, because I think the nature of modern research and development is such that the capacity for large numbers of people to cooperate and to brainstorm and really to work together for long-range goals is actually more important than the flash of genius of the inventor.

If you look at patent statistics, for example, back in the 1920s, 80 percent of patents were claimed by individuals. Nowadays, it's 80 percent are claimed by corporations. They may or they may not

name the inventor. And when they do name the inventor, it's usually a multiple list of inventors, not a single inventor.

Representative HAMILTON. How do Japanese enterprises do with regard to these patents as compared to the American enterprises?

Mr. DORE. Well, of course, now they're taking an increasing share of U.S. registrations as well as European registrations.

Representative HAMILTON. Dr. Nanto, I wanted to ask you a few questions about the keiretsu. They rig prices.

Mr. NANTO. They don't in a way that violates Japanese antitrust law.

Representative HAMILTON. If they did it in the United States, would we file suit against them for rigging prices?

Mr. NANTO. If they did it in the United States, we could, yes. But there's a lot of price leadership. In Japan, because there is so much price leadership, if the company within a certain period of time changes its prices to match another competitor's prices, it has to report that to the JFTC.

Representative HAMILTON. So there is a lot of price control then?

Mr. NANTO. There is an agreement, if you engage in price wars, everyone is going to lose. So they tend to compete on other areas.

Representative HAMILTON. Let's take the example of the drugstore out here in downtown Tokyo.

Does the manager of that store have full authority to set those prices where he wants to?

Mr. NANTO. Normally, there are incentives built into the wholesaling and retailing distribution system to make sure that the final retailer does not cut prices.

Representative HAMILTON. He can raise them but not cut them?

Mr. NANTO. He usually has suggested retail price.

Representative HAMILTON. And that's what he charges?

Mr. NANTO. That's what he charges.

Representative HAMILTON. So, the retailer doesn't have much discretion in pricing?

Mr. NANTO. He does. However, if he engages in price-cutting, he's going to give up certain bonuses and certain relationships with the manufacturer.

Representative HAMILTON. That's what you call gentle persuasion?

Mr. NANTO. That's right. Now, Japan's Fair Trade Commission has been monitoring these practices and some of the companies, like Matsushita said that it's going to stop doing that. That was part of the SII negotiations.

Representative HAMILTON. Was that—what do you call it?—the Japan Fair Trade Commission—is that equivalent to our antitrust?

Mr. NANTO. That's correct.

Representative HAMILTON. How vigorous are they?

Mr. NANTO. The complaint is that they are not very vigorous. In fact, they are fairly weak.

Representative HAMILTON. They don't bring very many suits in the Japanese courts?

Mr. NANTO. Not too many. They receive about 500 cases a year and, recently, have been finding only about a dozen violations per year. Most of the actions are cease and desist orders.

Representative HAMILTON. Does the keiretsu keep foreign firms out?

Mr. NANTO. They do in the sense that if you want to sell, especially to the integrated keiretsu, like the auto companies, if you want to sell a product that competes with one of their family members, it's very difficult to do so. It's very hard to break into that supplier relationship, and you can't do it just by offering a product at a lower price.

Representative HAMILTON. How do you do it?

Mr. NANTO. You do it by establishing a long-term relationship, by having a presence there.

Representative HAMILTON. With whom?

Mr. NANTO. The ultimate buyer. There are many ways that American companies have done it. One is to link up with one of the member supplier family members. The other is to work long-term with the engineers so that you are providing something that they want.

If you have a decidedly superior product and you go into Japan to sell it—and this is happening because there are many products like that, that the United States has—usually, what the Japanese firm will do is to create a product that they will manufacture around your product that is separate from the products that their other suppliers provide.

Representative HAMILTON. How many keiretsu are there?

Mr. NANTO. There are six very large ones, but there are many vertically integrated keiretsu, 30 or 40.

Representative HAMILTON. Would they represent a very substantial portion of the Japanese economy? Domestic economy?

Mr. NANTO. I mentioned earlier the nine largest trading companies, which are the center of many of these keiretsu groups, accounted for 74 percent of all Japanese imports.

Representative HAMILTON. We'd call them cartels?

Mr. NANTO. More diversified conglomerates, because they are in many industries.

Representative HAMILTON. If they were operating in the United States, would they be illegal?

Mr. NANTO. Not per se, but some of their activities could be.

Representative HAMILTON. The whole system seems to put an emphasis on the advantage or the welfare of the producer versus the consumer. Is that correct?

Mr. NANTO. Generally.

Representative HAMILTON. It's very much a producer-oriented system.

Mr. NANTO. In terms of government policy, that is true. The producer, however, as Dr. Dore said, is very attuned to the needs of the consumer. There's a lot of research and product development that tries to fill up every single little niche in Japan.

Representative HAMILTON. Figuring out what the consumer wants.

Mr. NANTO. That's right. Japan is so full of gadgets.

Representative HAMILTON. These keiretsu are private organizations?

Mr. NANTO. Yes, they are private.

Representative HAMILTON. What is their relationship to the government?

Mr. NANTO. They're private organizations.

Because they are so large, they have a lot of interaction with the government and also——

Representative HAMILTON. What do you mean by "interaction"? Does that mean that the chairman of the board and the president and the chief operating officer sits down with the Economics Minister and the Finance Minister on a regular basis?

Mr. NANTO. In the Ministry of International Trade and Industry there are bureaus and there are certain sections that are in charge of certain industries. And the sections, in fact, are charged to maintain the viability and health of this industry. If there's a major bankruptcy in that industry, often, the officials at MITI will be called to the Parliament to account for this.

And so there is close coordination between the bureau in MITI that is in charge of the specific industry, and the industry. But, usually, it is done through associations.

Representative HAMILTON. Do you mean, if you have a fellow over here in MITI who has responsibility for the success of the automobile industry or the success of the pharmaceutical industry, is that right? Is that what you're telling me?

Mr. NANTO. Yes.

Representative HAMILTON. And he works very, very closely with the captains of that industry?

Mr. NANTO. Usually, through their associations.

Representative HAMILTON. That's not an adversarial relationship; it's a cooperative relationship.

Mr. NANTO. No. It's cooperative.

Representative HAMILTON. Does the Japanese Chamber of Commerce ever say: Get the government off my back?

Mr. NANTO. Interestingly enough, Keidanren, which is the voice of Japanese big business, has been in favor of what they call deregulation, administrative reform, which is to try to get the government out of the business of providing so much detailed administrative guidance to the industries.

However, the industries do, in general, see the government as their ally rather than their adversary.

Representative HAMILTON. The best and the brightest coming out of the universities, where do they head?

Mr. DORE. A lot of them, of course, go into the Ministries.

Representative HAMILTON. If you're the top graduate of Tokyo University, is that where you want to go, usually?

Mr. DORE. That would certainly be a very good place to go.

Representative HAMILTON. If you want to go into Finance——

Mr. DORE. I'm sorry; certain Ministries. The Ministry of Finance and MITI, and maybe Justice would be ministries that you would want to go to.

Representative HAMILTON. So, the bright, ambitious, enterprising young man, or maybe young woman, too—I don't know—but the young person who wants to get into those government agencies, they want to become a government bureaucrat. Is that where they want to spend their life working, or do they want to switch over after a while and go into the private sector?

Mr. DORE. Most of them are determined to be there or expect to be there for a lifetime career.

Representative HAMILTON. Why is that? Do they get more money there, or more power?

Mr. DORE. They get more prestige.

Representative HAMILTON. Because they're a government bureaucrat?

Mr. DORE. Because they're a bureaucrat and because these are high-prestige agencies which are known to recruit only the brightest and the best. That halo effect is an important step in the process.

Representative HAMILTON. So, in MITI, for example, you have many long-term employees?

Mr. DORE. Almost exclusively long-term employees. In MITI, actually, about half of them are recruited from the law departments of the top universities or the social science or economics departments and half from the science departments.

Representative HAMILTON. How much money would they get paid as compared to a plant manager or a big shot at Toyota?

Mr. DORE. Less. At all stages of their career.

Representative HAMILTON. Half?

Mr. DORE. No, no, not half. Say, 80 percent.

Representative HAMILTON. So there's not a huge differential?

Mr. DORE. No. And, moreover, if you have distinguished yourself as a civil servant, when you get to the top, when you get to be a bureau chief and somebody from your entry-year group is appointed to be permanent secretary, then you more or less have to get out. And that means going out to a job, usually in a semi-governmental agency, and getting then a rather higher salary than you had before. Or, moving off after a couple of years into a firm, very often a firm which you have been dealing with in one of your capacities in your rotating career.

But you can't do that for two years.

Representative HAMILTON. If I understood you earlier, Dr. Nanto, they focus on rising industries and declining industries. Is that what you said a moment ago?

And their job is to help the rising industries come up and the declining industries to adjust.

Mr. NANTO. That's right.

Representative HAMILTON. Who makes that decision as to what's rising and what's declining?

Mr. NANTO. The declining industries themselves have to petition the government to create what's called a Depression Cartel, or a Recession Cartel. And there are certain criteria that they have to meet. For example, half of the firms have to be losing money.

So those are fairly easy to identify. The rising industries, there's a lot of discussion, there's a lot of going to international meetings, but I think there's a fair consensus in the world today about what the new technologies are that they need to be engaged in.

Representative HAMILTON. But they do more than just depict the technology. They pick the particular enterprise.

Ms. GENTHER. I think they do much more than choose the technology rather than the individual companies.

Representative HAMILTON. If you listen to people in the United States who propose an industrial policy, they will say that you don't want to get into this business of picking winners because it will become a highly politicized process under our system of government.

Does that criticism apply in Japan, that it becomes a highly politicized deal if you've got a lot of political clout? You know, the Prime Minister will, and you can get some money shifted over here into your enterprise instead of the other enterprise? Enterprise A instead of Enterprise B?

Ms. GENTHER. Most of the monetary breaks, tax credits, have been available across the board. And when they're targeted, it's targeted to an industry, again not to a specific firm. And what's happening now is it's even much less targeted toward an industry as opposed to being targeted toward, for example, advanced manufacturing systems or information processing systems.

Representative HAMILTON. What I want to get at is:

Is that a highly politicized process? It would be in the United States, wouldn't it?

Well, you don't need to answer that. I'll answer it.

[Laughter.]

Representative HAMILTON. It's a highly politicized process. We have a tax bill here on the floor. You know, we've got a thousand lobbyists out here in the hall. They're all trying to get this tax bill tilted their way, getting a break in the Tax Code.

Does that go in Japan?

Ms. GENTHER. I don't think it's politicized that way.

Representative HAMILTON. Why doesn't that go on in Japan?

Mr. DORE. I think, increasingly, what are known as the Zoku, the group of LDP Parliamentarians who have a special interest in, and man the Committees of the Parliament for, overseeing particular industries—it is generally agreed I think that their clout has increased over the last 10 years.

Representative HAMILTON. Who's clout has?

Mr. DORE. Their clout, vis-a-vis MITI.

Representative HAMILTON. I'm sorry? Who's their?

Mr. DORE. The parliamentarians, the politicians, that their clout has increased vis-a-vis MITI. There's a general belief in Japan that there is a rational public interest solution to every problem, and MITI is generally thought to be espousing that. And the politicians are seen as people who are pressing special interests. And their ability to influence legislation has undoubtedly increased in recent years, partly because of the cutback, as a result of the administrative reforms, in the subsidy budget, which means that the bureaucrats can't keep the politicians happy by giving them subsidies for bridges, hospitals and roads, and things in their constituencies, and, consequently, they're in a weaker position vis-a-vis the politicians.

Representative HAMILTON. But, if I'm a politician in the Japanese Diet and I've got an enterprise out here in my constituency that produces widgets, or whatever, and I decide, well, that industry needs some help, I presume there as here you go to bat for that industry and do all that you can to try to get some tax breaks or subsidies, or something.

Is that the way it works?

Mr. DORE. But, you do it not by directly opposing legislation, but by supporting the industry association in its negotiations with the bureaucrats, and try to mix into the process that basically goes on between the Ministry and, very often, not individual firms but the industry associations.

Representative HAMILTON. So you've got to work through the industry associations?

Mr. DORE. If you want to influence the bureaucrat's decisions about the application of already-established rules to a business in your constituency, then you can do that. Very often, you do it successfully.

Representative HAMILTON. On the whole, do you think MITI has a good record? Is it pretty good at this business of picking winners?

Mr. DORE. I think it's been very good at, in the first instance, observing the more advanced industrial countries and seeing where among proven technologies Japan should go next. No question about that.

But I think that now that they've got to the frontiers, they're also good. And the reason is because of this continuous interaction between the bureaucrats and the people in industry. I followed through a program on engineering fibers, and engineering ceramics, for example. And it was put together by a 29-year old chemistry graduate in MITI who was given the job of telephoning the research directors of all the leading firms and saying:

Look, I don't want you to tell me what breakthroughs you've just made, but you tell me what are the R&D projects that you would like to finance but that you can't really justify yet in commercial terms.

And he got a list from them. He then fed everybody's list back to everybody else. And out of that, he got a set of priorities.

Representative HAMILTON. You haven't said very much about labor unions. How important are labor unions in the Japanese economic success?

Mr. DORE. I would say they're really quite important.

Representative HAMILTON. Is there an adversarial relationship between the labor union and the company management?

Mr. DORE. Not the kind of fundamental adversarial relationship that prevents them from going off to golf together—except in those two months of the year when they're working up to a wage negotiation. And then they do sort of withdraw and they do bargain.

Representative HAMILTON. Do they strike?

Mr. DORE. Diminishingly, they strike. In the 1960s, they struck much more frequently.

Representative HAMILTON. Are the labor unions generally socialist?

Mr. DORE. I suppose it is still the case that more union members are requested by their union leaders to vote for Socialist candidates than LDP candidates. But, the extent to which that happens is of diminishing importance.

Representative HAMILTON. We hear a lot here about math and science education in Japan and what a great job they do with it, and all.

Is there a close tie between the educational system on the one hand and the kind of student they produce and the needs of Japanese industry on the other?

Mr. DORE. I think, if you asked high-technology firms in Japan, they'd say no, that they really want more people coming out of science and engineering departments than they're getting.

But I think most of them would also admit to the fact that there's probably a real-resource problem, that even if they expanded the science and technology departments in Japanese universities, they wouldn't get people who were talented enough to become the kind of graduates that they want; because, you see, there are lots of science and engineering departments of low-grade provincial universities which admit people with the equivalent of low S.A.T. scores, and the big firms really aren't interested in them, except as technicians.

Representative HAMILTON. Dr. Genther, you talked about cooperation a lot. Is the labor union brought into that process?

Ms. GENTHER. I think cooperation happens at all different levels. Dr. Dore was talking about learning cooperation within schools. And that there's much more cooperation between labor unions and junior executives within a firm, and cooperation within firms, within trade associations, and then between the government and the trade associations.

Representative HAMILTON. Kind of a settled mind in the whole society. I'm jumping around quite a bit. I've got a bell. I'm going to quit here pretty quickly. I've got a lot of questions.

But, why is capital cheaper in Japan?

Mr. NANTO. Well, traditionally, the Japanese have maintained controls on the interest rate paid for savings accounts and because the Japanese are such high savers, there tends to be a large supply of capital.

However, now, because of the internationalization of Japan's capital markets, actually, interest rates on the major financial instruments are about 7 and 8 percent. And so capital in Japan is no longer very cheap.

Representative HAMILTON. Is it true generally that U.S. firms have their high priority on profit and return on investment and Japanese firms have their priority on maximizing market share? Is that a fair generalization?

Mr. NANTO. It is to a certain extent. That's because of the system in which the companies operate. Because of the fact that we do have to have a quarterly report and the share price depends on that, you do have to be sensitive to short-term profits.

Representative HAMILTON. If you were a Japanese shareholder, you would get less dividends?

Mr. NANTO. Yes, dividends tend to be fairly low. However, they try to keep dividends at about the same level as the interest rate on the bonds so that you do get something.

Representative HAMILTON. Why is it a Japanese shareholders accepts much less of a return than an American shareholder?

Mr. NANTO. Traditionally, there haven't been too many alternatives. And also because many of the Japanese shareholders are other companies. Sixty percent of all shares are held by other com-

panies or banks, and they're not interested in dividends so much as this long-term relationship.

Representative HAMILTON. Now, there are a lot of very inefficient sectors in the Japanese economy, aren't there? You mentioned coal, agriculture—or you didn't mention coal. You mentioned agriculture—but coal is one, isn't it? And lumber, processing, retail distribution is not very efficient.

And I've run out of time.

Thank you very much for your participation today. And we have another hearing on Thursday in which we'll look at some of the trade policies and practices.

The hearing will be the second of a series. You've gotten us off to a good start today. We appreciate that very, very much. We thank you for your participation.

We stand adjourned.

[Whereupon, at 12:40 p.m., the hearing was adjourned.]

JAPAN'S ECONOMIC CHALLENGE: TRADE POLICIES AND PRACTICES

THURSDAY, OCTOBER 18, 1990

U.S. CONGRESS,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The committee met at 10:06 a.m. in room 2359 of the Rayburn House Office Building, the Honorable Lee H. Hamilton (chairman of the committee) presiding.

Present: Representatives Hamilton and Scheuer.

Staff Present: Richard Kaufman, Dorothy Robyn, Carl Delfeld and Mary Irace.

OPENING STATEMENT OF REPRESENTATIVE HAMILTON, CHAIRMAN

Representative HAMILTON [presiding]. The meeting of the Joint Economic Committee will come to order. This morning, we will have the second in a series of hearings on the Japanese economy in which we hope to get a better understanding of the challenges to the United States.

The hearings will be based, to a large extent, on the forthcoming study soon to be released by the Committee, entitled Japan's Economic Challenge. The study contains a large number of papers contributed by government and private specialists on Japan's economy. The topics covered include fiscal and monetary policy, finance and investment, the roles of government, business and labor, and their interrelationships, social security, science and technology, the environment, the defense sector, foreign aid, and a number of other topics.

In the first of these hearings, when we discussed the roles of government, business and labor in the Japanese economy, we released two of the papers from the study.

Today's subject is Japan's international trade and we are releasing three more papers related to that subject. Two of the papers are by authors who are also among today's witnesses, and one is by Stephen V. Marks, a Visiting Senior Economist with the State Department and an Associate Professor of Economics at Pomona College. Dr. Marks' paper is an analysis of Japan's 1990 Import-Expansion Measures which we hope to discuss during the day's proceedings.

Now, we are very fortunate to have with us today a knowledgeable and distinguished panel of experts.

Alan Wolff held the rank of Ambassador when he served as United States Deputy Special Representative for Trade Negotiations in the Carter Administration. He's a partner in the Dewey Ballantine law firm and is one of the contributors to the JEC study on Japan.

William Cooper is a specialist in international trade and finance at the Congressional Research service of the Library of Congress and has written extensively on U.S. Trade with Japan and other East Asian countries. He is also a contributor to the JEC study.

Edward Lincoln is a Senior Fellow in the Foreign Policy Studies Program at the Brookings Institution, and the author of books and articles on Japan, including Japan's Unequal Trade, published this year.

We welcome each of you to this hearing and look forward to your testimony and to the discussion that will follow. The format will be for each of you to take a few minutes to present your views orally and, after you have made those presentations, we will have a question and answer session.

Your statements, of course, will be entered into the record in full.

Does it make any difference where we start here?

Mr. Cooper, you're on the left. We'll just go with you and move across the table, one right after the other.

[The prepared statement of Representative Hamilton follows:]

PREPARED STATEMENT OF REPRESENTATIVE HAMILTON

This morning we will have the second in a series of hearings on the Japanese economy in which we hope to get a better understanding of the challenges to the United States.

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We are devoting considerable time to Japan because of what may seem obvious reasons. It is the world's second largest economic superpower and one of our most important trading partners. There has been a great amount of discussion of Japan and her relatively rapid rise. And, of course, there is growing controversy over her trade and investment practices.

But much more needs to be known about the Japanese economy itself, its strengths and weaknesses, the secrets of its success, and the lessons we might learn.

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We welcome all of you and look forward to your testimony and the dialog that will follow. The format will be for each of you to take about 10 minutes to present your views orally. After all have made presentation, we will have a question and answer period. Ambassador Wolff, you may proceed first.

STATEMENT OF MR. WILLIAM H. COOPER, SPECIALIST IN INTERNATIONAL TRADE AND FINANCE, ECONOMIC DIVISION, CONGRESSIONAL RESEARCH SERVICE

Mr. COOPER. Thank you, Mr. Chairman.

I appreciate your invitation to appear before the Committee to discuss the issue of Japan's economic challenge. In my statement, I will examine some key issues in U.S.-Japanese economic relations and how they developed in the 1980s and, based on this analysis, I shall examine the prospects of U.S.-Japanese economic relations in the 1990s, and the opportunities and risks these relations present to both countries.

As you know, the Congressional Research Service takes no position on pending legislation. Perhaps the issue that most helped to set the tone of U.S.-Japanese trade relations in the 1980s was the U.S. trade deficit. For a number of people, the trends in the bilateral trade balance became an indicator of the state of overall U.S.-Japanese relations.

The growth of the U.S. trade deficit with Japan in the 1980s, therefore, came to signify a growing imbalance in Japan's favor. While the correctness of this view is debatable, the trade deficit persisted as a cloud over the entire bilateral relationship.

From 1980–87, the annual U.S. trade deficit with Japan soared, from $10.2 to $56.8 billion, largely because of the rapid appreciation of the U.S. dollar in terms of the yen, itself a symptom of a growing savings-investment imbalance in the United States.

Since 1987, the U.S. trade deficit with Japan has been declining. In 1989, it was valued at $49 billion and, in 1990, the deficit could decline to around $39 billion if current trends prevail.

Most economists attribute the decline to the effects, albeit with some lag, of dollar depreciation which began in 1985 that made U.S. exports to Japan cheaper and, thus, more competitive, and imports from Japan to the United States more expensive.

Despite the decline in the U.S. trade deficit with Japan, some observers still hold that it remains too large and point out that the U.S. trade balance with Japan has not improved as rapidly as U.S. bilateral trade balances with other major trading partners.

Others suggest that too much attention has been paid to the U.S.-Japanese bilateral trade balance rather than the overall U.S. trade picture, which has been improving more rapidly.

Along with the lingering U.S. trade deficit, problems associated with Japanese barriers to imports have been another irritant in U.S.-Japanese economic relations during the past decade. As Japan's trade surplus with the United States rose and Japanese industry became more competitive, the United States grew less toler-

ant of restrictive Japanese trade and industrial policies that helped Japan's post-War industrialization.

The United States pressured Japan to remove trade barriers and provide a level playing field on which U.S. firms could compete in the Japanese market. In the 1970s, U.S. concern centered around high Japanese tariffs and import quotas, but by the beginning of the 1980s, Japan had lowered its tariffs to levels at or below those of other industrialized countries and had removed import quotas on most products, with the notable exception of agricultural products.

In the 1980s, the emphasis of U.S. trade policy towards Japan shifted from high tariffs and quotas to less overt trade barriers. These informal barriers have included government/administrative guidance, product standards, customs clearance procedures and procurement practices that can be structured or implemented to favor Japanese producers. They have also included private business practices, predatory pricing practices and the product distribution system that limit foreign penetration into Japanese markets.

The United States pursued bilateral negotiations on market access in many areas with Japan. In the mid-1980s, for example, the two countries conducted the Market-Oriented Sector-Selective talks, more commonly known as MOSS. MOSS was a comprehensive series of negotiations to address barriers in five commodity areas—telecommunications, medical equipment and pharmaceuticals, forestry products, electronics products, and auto parts. The United States pursued market access with Japan outside of the MOSS framework as well in the areas of semiconductors, construction services, agriculture, tobacco products, among others.

Many times these negotiations over market access in Japan have proved difficult. The U.S. position has been that Japan has benefited from open U.S. markets and must now reciprocate. U.S. negotiators, armed with the threat of restricting Japanese access to American markets, applied pressure to pry open Japanese markets to U.S. exporters. Japanese negotiators resisted what they considered to be U.S. interference in their economic affairs. In some cases, these negotiations reached the highest policymaking levels on both sides generating much bilateral friction before being resolved.

In the last 2 years, the United States pursued market access in Japan more intensively as frustration built up over a stubborn U.S. trade deficit with Japan and over a perceived Japanese intransigence in opening its markets to U.S. exporters in some areas.

In 1988, the Congress passed the Omnibus Trade Law, which included the so-called Super 301 provision. Super-301 required the U.S. Trade Representative to identify in May 1989 and again in April 1990 those countries that were the most egregious practitioners of major unfair trade practices.

Ambassador Carla Hills named Japan in May 1989 citing unfair trade practices in three product areas—satellites, supercomputers and wood products. In accordance with the statute, the U.S. Trade Representative pursued negotiations with Japan in each of the areas.

The two countries reached agreements but not without difficulties. Japan was not named as a Super-301 country in April 1990. The evaluations of Super-301 have been mixed. Some observers have argued that Japan only responds to external pressure before

changing its trade policies and that Super-301 demonstrates how serious the United States is in opening foreign markets for U.S. exporters. Others have argued that the deadlines and other criteria of Super-301 only serve to heighten frictions and that the resolution of trade issues can be accomplished through less restrictive mechanisms.

In May 1989, the United States initiated the Structural Impediments Initiative, the SSI, with Japan. The SSI was a series of discussions on the structural elements of the Japanese and U.S. economies often cited as impediments to trade and investments. In the SSI, the United States identified six areas as Japanese structural barriers: the high Japanese savings rate, Japanese business groups, such as the Keiretsu; land use policies that led to high land prices in Japan; government tolerance of anti-competitive business practices; the product distribution system and anti—competitive pricing policies.

Japan cited seven U.S. practices as structural barriers: the low U.S. savings rate; inadequate business investment; short-term corporate strategies; U.S. antitrust laws; inadequate R&D spending; inadequate export promotion and insufficient worker training.

In June 1990, U.S. and Japanese negotiators issued a report on the SSI in which the two countries outlined measures they would undertake to address the structural impediments in their respective economies. They've also agreed to follow up meetings during the next 3 years to monitor progress on the implementation of the SSI results.

The SSI process does address fundamental elements of the Japanese economy that are widely viewed as distorting trade and investment patterns. During the process, the two countries have learned more about how each other's economy operates, which could help to improve the negotiating environment in the future. But, ultimately, the SSI will likely be judged on whether it produces tangible results.

Will U.S. exports to and investments in Japan increase, will the U.S. trade deficit with Japan decrease?

At this stage, it would be premature to render a judgment. If Japan proceeds to reform the distribution, reduce trade-distorting business practices and take other steps it has proposed in the SSI report, more opportunities should open for U.S. business in Japan.

Furthermore, Japanese consumers and the country as a whole would presumably benefit from a more efficiently-run economy. In the 1980s, competition from Japanese imports which had already become strong grew rapidly because of the appreciating dollar and other factors. In response to pressure from hard-hit industries, the United States negotiated voluntary restraint agreements or VRAs with Japan under which Japan agreed to restrict exports of particular products.

In exchange, the United States imposed no other import restrictions on those goods. By the end of the 1980s, the United States and Japan had VRAs in place on machine tools and steel. Japan has extended the auto VRA unilaterally, although the United States has not officially insisted on it.

Though bilateral trade issues occupied the center of U.S.-Japanese economic relations for most of the 1980s, by the end of the

decade, the rapid growth of Japanese direct and portfolio investments in the United States drew the attention of U.S. policymakers and the public in general.

Japanese direct investments, that is, ownership of U.S.based businesses and real estate, soared in the 1980s. From 1981 to 1989, the Japanese net direct investment position in the United States grew from $7.7 billion to $69.7 billion. Japanese investments in manufacturing facilities, wholesale trade establishments and real estate led the surge.

Japanese foreign direct investments have proved a boon to some industrial sectors and regions in the United States. Many State governments have been promoting Japanese investment, but Japanese investments have also been controversial. Although Japanese investments account for a very small share of total U.S. assets, acquisitions of highly-visible assets, such as the Rockefeller Center, Columbia Pictures and 7-Eleven by Japanese investors have fed a perception that Japan is buying up America. They have also sparked a policy debate over the role of foreign investments in the U.S. economy with proposals emerging to restrict such investments and to improve U.S. collection of foreign investment data.

The Omnibus Trade Act of 1980 included the provision, the Exon-Florio Amendment, authorizing the President to block foreign investments that are deemed a threat to the national security. The largest portion of Japanese investments in the United States has been in portfolio investment. That is, U.S. Treasury securities, corporate stocks and bonds and bank deposits.

Japanese investments have helped bill the U.S. need for investment capital caused by U.S. dis-savings. Japanese investments in U.S. Treasury securities have helped directly to finance the federal budget deficit. But, the rapid surge in the 1980s in portfolio investments has raised questions about the rise of Japanese influence in U.S. financial markets and the possibility and potential effects of sudden withdrawals by Japanese investors.

The U.S. economic relationship with Japan as it developed in the 1980s was one in which Japan became an increasingly important partner. This importance was evident in the rapid growth of bilateral trade in investments that tie the U.S. economy more closely to Japan. At the same time, differences over trade and other economic issues—trade imbalances, access to Japanese markets, competition from Japanese imports—produce growing friction bordering on confrontation that seem to threaten the health of the bilateral alliance.

As the U.S. economic relationship with Japan enters the 1990s, its shape remains about the same. As Japan grows as a world economic power its importance to the United States strengthens rather than diminishes. The U.S. trade deficit with Japan has been declining, but whether that trend is sustainable depends in large part on the movement and exchange rates and changes in the underlying macroeconomic factors that help to determine them.

Market access in Japan continues to be a source of problems confronting U.S. policymakers. American producers of semiconductors, construction services, auto parts, rice and other products still find it difficult, if not impossible, to penetrate Japanese markets to a

degree they feel is commensurate with their competitiveness in other markets.

And as the experience with the Structural Impediments Initiative has shown, some of the Japanese policies and practices that create market access difficulties are deeply seated and resistant to rapid change.

Furthermore, American industries face growing competition from Japan as Japanese producers expand into a widening range of areas, especially in the high-technology sectors.

For U.S. policymakers, this means that Japan will likely remain a source of economic challenges with which they will have to deal. The importance of these challenges could become more pronounced. As the military threat from the Soviet Union diminishes, the national security is defined increasingly in terms of economics.

Furthermore, Japan's enhanced economic power can make dealing with Japan more difficult. It may lead to the Japanese government to take an increasingly independent policy stance in world economic and strategic affairs.

The era when Japan almost automatically supported U.S. policy positions is ending as Japan assumes the number two position at the International Monetary Fund and it pours aid money into developing countries previously dependent on U.S. assistance and becomes the world's largest creditor.

Some elements in Japan already espouse the use of Japan's financial power and technical prowess to counter U.S. pressures. Some observers perceive a risk that U.S. pressure in Japan could generate a response hostile to American interests and detrimental to both bilateral and world relationships.

Thus, Japan's enhanced economic power could make the bilateral economic relationship even more contentious than in the past.

As their economic relationship continues to evolve in the 1990s, the United States and Japan face opportunities to strengthen their relations with benefits to them as well as to the world as a whole. But they also face potential pitfalls that could undermine their bilateral relationship with troubling implications.

In the 1980s, the United States and Japan grappled with difficult issues. These issues have largely pertained to opening borders to trade and investment. While the jury is still out on the ultimate effects of the agreements reached so far by the two countries, it appears that bilateral economic relations are more open now than was the case in 1980. From an economic point of view, more open trade and investment have created opportunities for consumers, producers and investors of each country and thereby improved the welfare of both.

They have also created opportunities for producers and investors from third countries, adding to the general welfare of the world as a whole. In so doing, the United States and Japan have helped to promote the objectives underlying the multilateral trading system embedded in the General Agreement on Tariffs and Trade, the GATT.

If their relationship continues to broaden and become more inter-dependent in the 1990s, the United States and Japan will have the opportunity to build on this experience. However, in the 1990s, the United States and Japan face risks. One risk is the po-

tential increase in bilateral friction that endangers an otherwise healthy relationship.

The U.S. trade deficit with Japan could remain a source of tension, at least for the next few years. United States-Japanese commercial competition could intensify and widen into other fields providing fertile ground for friction.

And the increased complexity of the economic issues that the United States and Japan confront also looms as a source of friction. A second risk is the potential net economic losses from the growth of trade and investment protectionism in both countries. As barriers are brought down, competition intensifies among countries, certain economic groups are adversely affected.

These groups seek governmental protection from foreign competition. Protectionism can benefit those groups for which it is implemented. But, from the economist's perspective, society as a whole generally bears the cost of inefficiency and higher cost for protected products and services.

Preoccupation with their bilateral economic relations to the detriment of other relationships could carry associated costs for the United States and Japan. In the 1980s, both countries expended much time and energy and political capital in the trade imbalance, trade barriers and other bilateral issues.

This has raised some concern among other countries that the United States and Japan may be developing special arrangements at the expense of relations with third countries.

Furthermore, some observers have speculated that excessive focus on bilateral relations could undermine the U.S. and Japanese commitment to the GATT, especially at a time when members are dealing with sensitive issues in the expansion of the GATT framework.

Mr. Chairman, that's the end of my formal remarks and I would be happy to take questions from you and the other members of the Committee.

[The prepared statement of William Cooper follows:]

PREPARED STATEMENT OF WILLIAM H. COOPER

U.S.-JAPANESE ECONOMIC RELATIONS: KEY ISSUES AND PROSPECTS

Mr. Chairman, I appreciate your invitation to appear to examine some key issues in U.S.-Japanese economic relations—the U.S. trade deficit, market access in Japan, competition from Japanese imports, and Japanese investments in the United States—and how they developed in the 1980s. Based on this analysis, I shall examine the prospects for U.S.-Japanese economic relations in the 1990s and the opportunities and risks these relations present to both countries. The Congressional Research Service takes no position on pending legislation.

The economic relationship with Japan was one of the most important policy issues for the United States in the 1980s. During the past 2 decades, Japan matured as a commercial and financial power challenging the United States as an economic leader for the first time in the post-World War II era. In one sense, the United States and Japan grew closer as they became more economically interdependent. In another sense, they grew apart as differences over trade practices and economic policies generated frictions and misunderstandings that have at times appeared to threaten the health of the bilateral relationship.

The importance to the United States of economic relations with Japan will likely increase in the 1990s as Japan continues to grow as a world economic power and as the issues in U.S.-Japanese economic relations become even more complex.

U.S.-JAPANESE TRADE AND THE U.S. TRADE DEFICIT

Perhaps, the issue that most helped to set the tone of U.S.-Japanese trade relations in the 1980s was the U.S. trade deficit. For a number of people, the trends in the bilateral trade balance became an indicator of the state of overall U.S.-Japanese relations. The growth in the U.S. trade deficit with Japan in the 1980s, therefore, came to signify a growing imbalance in Japan's favor. While the correctness of this view is debatable, the trade deficit persisted as a cloud over the entire bilateral relationship.

From 1980 to 1987, the annual U.S. trade deficit with Japan soared from $10.2 billion to $56.8 billion largely because of the rapid appreciation of the U.S. dollar in terms of the yen, itself a symptom of a growing savings-investment imbalance in the United States. Since 1937, the U.S. trade deficit with Japan has been declining. In 1989, it was valued at $49 billion, and in 1990, the deficit could decline around $39 billion if current trend prevail. Most economists attribute the decline to the effects, albeit with some lag, of dollar depreciation which began in 1985 that made U.S. exports to Japan cheaper and thus more competitive, and imports from Japan to the United States more expensive.

Despite the decline in the U.S. trade deficit with Japan, some observers still hold that it remains too large and point out that the U.S. trade balance with Japan has not improved as rapidly as U.S. bilateral trade balances with other major trading partners. Others suggest that too much attention has been paid to the U.S.-Japanese bilateral trade balance rather than the overall U.S. trade picture which has been improving more rapidly.

The United States and Japan have become more dependent on each other in trade. The United States has long been Japan's most important trade partner and is becoming more so. In 1989, the United States accounted for 34 percent of Japanese exports, an increase from 24 percent in 1980. Japanese manufacturers of consumer goods, automobiles, and other products rely on U.S. markets. The United States is an important source of imports into Japan. From 1980 to 1989 the U.S. share of Japanese imports grew from 17 percent to 23 percent. Imports of American agricultural products are a significant source of food products for Japan.

At the same time, Japan's importance in U.S. trade has grown. In 1989, 12 percent of U.S. exports went to Japan, an increase from 9 percent in 1980. Japan's role as a source of U.S. imports is well known. Japan accounts for the largest share of U.S. imports accounting for 20 percent in 1989 having increased from 13 percent in 1980.

MARKET ACCESS

Along with the lingering U.S. trade deficit, problems associated with Japanese barriers to imports have been another irritant in U.S.-Japanese economic relations during the past decade. As Japan's trade surplus with the United States rose and Japanese industry became more competitive, the United States grew less tolerant of restrictive Japanese trade and industrial policies that helped drive Japan's postwar industrialization. The United States pressured Japan to remove trade barriers and provide a "level playing field" on which U.S. firms could compete in the Japanese market. In the 1970s, U.S. concerns centered around high Japanese tariffs and import quotas. By the beginning of the 1980s, Japan had lowered its tariffs to levels at or below those of the other industrialized countries and had removed import quotas on most products with the notable exception of agricultural products.

In the 1980s, the emphasis of U.S. trade policy towards Japan shifted from high tariffs and quotas to less overt trade barriers. These "informal" barriers have included government administrative guidance, product standards, customs clearance procedures, and procurement practices that can be structured or implemented to favor Japanese producers. They also have included private business practices, predatory pricing practices, and the product distribution system, that limit foreign penetration into Japanese markets.

The United States pursued bilateral negotiations on market access in many areas with Japan. In the mid-1980s, for example, the two countries conducted the Market-Oriented Sector-Selective talks, more commonly known as MOSS. MOSS was a comprehensive series of negotiations to address barriers in five commodity areas—telecommunications, medical equipment and pharmaceuticals, forestry products, electronics products, and auto parts. The United States pursued market access with Japan outside the MOSS framework as well in the areas of semiconductors, construction services, agriculture, tobacco products, among others.

Many times these negotiations over market access in Japan have proved difficult. The U.S. position has been that Japan has benefited from open U.S. markets and

must now reciprocate. U.S. negotiators, armed with the threat of restricting Japanese access to American markets, applied pressure to pry open Japanese markets to U.S. exporters. Japanese negotiators resisted what they considered to be U.S. interference in their economic affairs. In some cases, these negotiations reached the highest policymaking levels on both sides generating much bilateral friction before being resolved.

In the last 2 years, the United States pursued market access in Japan more intensively as frustration built up over a stubborn U.S. trade deficit with Japan and a perceived Japanese intransigence in opening its markets to U.S. exporters in some areas. In 1988, the Congress passed the Omnibus Trade and Competitiveness Act (P.L. 100-418) which included the so-called "Super 301" provision. Super 301 required the U.S. Trade Representative (USTR) to identify in May 1989 and again in April 1990, those countries that were the most egregious practitioners of major unfair trade practices.

USTR Carla Hills named Japan in May 1989 citing unfair trade practices in three product areas—satellites, supercomputers and wood products. In accordance with the stature, the USTR pursued negotiations with Japan in each of the areas. The two countries reached agreements but not without some difficulties. Japan was not named as a Super 301 country in April 1990.

The evaluations of Super 301 have been mixed. Some observers have argued that Japan only responds to external pressure before changing its trade policies and that Super 301 demonstrates how seriously the United States is in opening foreign markets for U.S. exporters. Others have argued that the deadlines and other criteria of Super 301 only serve to heighten frictions and that the resolution of trade issues can be accomplished through less restrictive mechanisms.

In May 1989, the United States initiated the Structural Impediments Initiative, the SII, with Japan. The SII was a series of discussions on the structural elements of the Japanese and U.S. economies often cited as impediments to trade and investments. In the SII, the United States identified six areas as Japanese structural barriers; the high Japanese savings rate; Japanese business conglomerates, such as the *keiretsu;* land-use policies that have led to high land prices in Japan; government tolerance of anticompetitive business practices; the product distribution system; and anticompetitive pricing policies. Japan cited seven U.S. practices as structural barriers: the low U.S. savings rate; inadequate business investment; short-term corporate strategies; U.S. antitrust laws; inadequate R&D spending; inadequate export promotion; and insufficient worker training. In June 1990, U.S. and Japanese negotiators issued a report on the SII in which the two countries outlined measures they would undertake to address the structural impediments in their respective economies. They have also agreed to follow-up meetings during the next 3 years to monitor progress on the implementation of the SII results.

The SII process does address fundamental elements of the Japanese economy that are widely viewed as distorting trade and investment patterns. During the process, the two countries have learned more about how each other's economy operates which could help to improve the negotiating environment in the future. But ultimately, the SII will likely be judged on whether it produces tangible results. Will U.S. exports to and investments in Japan increase? Will the U.S. trade deficit with Japan decrease? At this stage, it would be premature to render a judgement. If Japan proceeds to reform distribution system, reduce trade distorting business practices, and take other steps it has proposed in the SII report, more opportunities should open for U.S. business in Japan. Furthermore, Japanese consumers and the country whole would presumably benefit from a more efficiently run economy.

IMPORT COMPETITION

In the 1980s, competition from Japanese imports, which had already become strong, grew rapidly because of the appreciating dollar and other factors. In response to pressure from hard-hit industries, the United States negotiated "voluntary restraint agreements," or VRAs, with Japan under which Japan agreed to restrict exports of particular products. In exchange, the United States imposed no other import restrictions on those goods. By the end of the 1980s, the United States and Japan had VRAs in place on machine goods and steel. Japan has extended the auto VRA unilaterally, although the United States has not officially insisted on it.

JAPANESE INVESTMENTS IN THE UNITED STATES

While biolateral trade issues occupied the center of U.S.-Japanese economic conditions for most of the 1980s, by the end of the decade the rapid growth of Japanese

direct and portfolio investments in the United States drew the attention of the U.S. policymakers and the public in general.

Japanese direct investments, that is, ownership of U.S.-based businesses in real estate soared in the 1980s. From 1981 to 1989, the Japanese net direct investment position in the United States grew from $7.7 billion to $69.7 billion. Japanese investments in manufacturing facilities, wholesale trade establishments, and real estate led the surge. Japanese foreign direct investments have proved a boon to some industrial sectors and regions in the United States. Many State governments have been promoting Japanese investment. But Japanese investments have also been controversial. Although Japanese investments account for a very small share of total U.S. assets, acquisitions of highly visible assets such as the Rockefeller Center, Columbia Pictures, and 7-Eleven by Japanese investors have fed a perception that Japan is "buying up" America. They have also sparked a policy debate over the role of foreign investments in the U.S. economy, with proposals emerging to restrict such investments and to improve U.S. collection of foreign investment data. The Omnibus Trade and Competitiveness Act of 1988 included a provision, the Exon-Florio amendment, authorizing the President to block foreign investments that are deemed a threat to the national security.

The largest portion of Japanese investments in the United States has been in portfolio investments—U.S. Treasury securities, corporate stocks and bonds, and bank deposits. Japanese investments have helped fill the U.S. need for investment capital caused by U.S. dissavings. Japanese investments in U.S. Treasury securities have helped directly to finance the Federal budget deficit. But the rapid surge in the 1980s in portfolio investments has raised questions about the rise of Japanese influence in U.S. financial markets and the possibility and potential effects of sudden withdrawals by Japanese investors.

LOOKING AHEAD

The U.S. economic relationship with Japan as it developed in the 1980s was one in which Japan became an increasingly important partner. This importance was evident in the rapid growth of bilateral trade and investments that tied the U.S. economy more closely to Japan. At the same time, differences over trade and other economic issues—trade imbalances, access to Japanese markets, competition from Japanese imports—produced growing friction bordering on confrontation that seemed to threaten the health of the bilateral alliance.

As the U.S. economic relationship enters the 1990s, its shape remains about the same. As Japan grows as a world economic power, its importance to the United States strengthens rather diminishes. The U.S. trade deficit with Japan has been declining. But whether that trend is sustained will depend, in large part, on the movement in exchange rates and changes in the underlying macroeconomic factors, such as real interest rates, that help to determine them. Market access in Japan continues to be a source of problems confronting U.S. policymakers. American producers of semiconductors, construction services, auto parts, rice, and some other products still find it difficult, if not impossible, to penetrate Japanese markets to a degree, they feel, is commensurate with their competitiveness in other markets. And as the experience with the Structural Impediments Initiative has shown, some of the Japanese policies and practices that create market access difficulties are deeply seeded and resistant to rapid change. Furthermore, American industries face growing competition from Japan as Japanese producers expand into a widening range of areas, especially in the high technology sectors.

For U.S. policymakers, this means that Japan will likely remain a source of economic challenges with which they will have to deal. The importance of these challenges could become more pronounced as the military threat from the Soviet Union diminishes and national security is defined increasingly, at least by some, in terms of economics.

Furthermore, Japan's enhanced economic power could make dealing with Japan more difficult. It may lead to the Japanese government to take an increasingly independent policy stance in world economic and strategic affairs. The era when Japan almost automatically supported U.S. policy positions is ending as Japan assumes the number two position at the International Monetary Fund, pours aid money into developing countries previously dependent on U.S. assistance, and becomes the world's largest creditor nation. Some elements in Japan already espouse the use of Japan's financial power or technical prowness to counter U.S. pressures. Some observers perceive a risk that U.S. pressure on Japan could generate a response hostile to American interests and detrimental to both bilateral and world relationships. Thus, Japan's enhanced economic power could make the bilateral economic relationship even more contentious than in the past.

THE OPPORTUNITIES AND RISKS

As their economic relationship continues to evolve in the 1990s, the United States and Japan face opportunities to strengthen their relations with benefits to them as well as to the world as a whole. But they also face potential pitfalls that could undermine their bilateral relationship with troubling implications.

In the 1980s, the United States and Japan grappled with difficult issues. These issues have largely pertained to opening borders to trade and investment. While the jury is still out on the ultimate effects of the agreements reached so far by the two countries, it appears that bilateral economic relations are more open now than was the case in 1980. From an economic point of view, more open trade and investment have created opportunities for consumers, producers and investors of each country and thereby improved the welfare of both. They have also created opportunities for producers and investors from third countries adding to the general welfare of the world as a whole. In so doing, the United States and Japan have helped to promote the objectives underlying the multilateral trading system embedded in the General Agreement on Tariffs and Trade, the GATT. If their relationship continues to broaden and become more interdependent in the 1990s, the United States and Japan will have the opportunity to build on this experience.

However, in the 1990s, the United States and Japan face risks. One risk is the potential increase in bilateral friction that endangers an otherwise healthy relationship. The U.S. trade deficit with Japan could remain a source of tension at least for the next few years. United States-Japanese commercial competition could intensify and widen into other fields providing fertile ground for friction. And the increased complexity of the economic issues that the United States and Japan confront also looms as a source of friction.

A second risk is potential net economic losses from the growth of trade and investment protectionism in both countries. As barriers are brought down and competition intensifies among countries, certain economic groups are adversely affected. These groups seek governmental protection from foreign competition. Protectionism can benefit those groups for which it is implemented. But, from an economist's perspective, society as a whole generally bears the costs of inefficiency in higher costs for protected products and services.

Preoccupation with their bilateral economic relations to the detriment of other relationships could carry associated costs. In the 1980s, both countries expended much time, energy and political capital on the trade imbalance, trade barriers and other bilateral issues. This has raised some concern among other countries that the United States and Japan may be developing special arrangements at the expense of relations with third countries. Furthermore, some observers have speculated that excessive focus on bilateral relations could undermine the U.S. and Japanese commitment to the GATT, especially at a time when members are dealing with sensitive issues in the expansion of the GATT framework.

STATEMENT OF MR. EDWARD LINCOLN, SENIOR FELLOW OF FOREIGN POLICY, BROOKINGS INSTITUTION

Mr. LINCOLN. Mr. Chairman, thank you for this opportunity to discuss what I think is an important set of issues. I have not submitted a paper for the publication that's coming out but let me start by saying I think you have a set of very good papers. I find very little, if anything, to disagree with those papers and, in particular, with Bill Cooper and Alan Wolff.

I have submitted to you a short written testimony. I think, this morning, there's probably no point in repeating precisely what is in there. Again, it's mainly supportive of what you will hear from the others this morning, to the effect that, although there is much to admire in Japan in its ability to forge ahead in the manufacturing sector, or manufacturing technologies, Japan is also a basically protectionist market. And the fact that the Japanese deny that, to me, does not eliminate the fact that it is protectionist.

The analysis which I had in my testimony is based on research that I've been doing over the past several years. And I must admit I think it has been soundly endorsed by the former Chief Trade Ne-

gotiator of the Japanese government, who recently denounced my findings as completely worthless. I can't think of a better endorsement for what I have come up with.

So what I would like to do this morning is focus on something a little bit different, to provide some variety, and look at the question of change in Japan's approach toward the world and how that may affect trade behavior on into the 1990s, since I think that a principal concern we ought to have is where we will be going after the Uruguay Round is finished.

It is important for us to recognize that there are many forces of change in Japan at the present time which ought to affect its trade behavior. First, and perhaps most important, Japan has caught up with the United States and the rest of the world. This was a very strong national goal for the last 100 years in Japan. It was a cause for the establishment of much of the protectionism that we have found in Japan.

But, this long phase in Japanese history is over. The Japanese no longer describe themselves to us as "four small, resource-poor islands." They are now confident about their own economic ability and, in some cases, even becoming rather arrogant about it.

With this economic success there are some other things that are happening. There has been over the past 5 years a tremendous surge in travel and by Japanese individuals abroad. They're not just traveling for pleasure, they are also living abroad, and they are being educated abroad.

This is a tremendous contrast to the past where at least, say, during the 1950s and 1960s, Japan was an extremely isolated country. Very few Japanese—even very few Japanese businessmen—actually went out and saw the rest of the world.

Certainly, not all of these people are going to adopt liberal views of Japan's relationship with the world, but travel is a broadening experience.

We find, for example, that even Japanese consumers are moving overseas. In the years from 1985 through 1989, we find a $19 billion shift in the travel and transportation accounts in Japan's balance of payments, a large part of which is due to the decision of Japanese consumers to purchase consumer goods overseas rather than in Japan. To me, that is eloquent testimony to their perception that they live in a rather protected market with high prices.

Another extremely important change for Japan is its rise as a creditor nation. Now, I am sure you have heard many times that Japan is now the largest net creditor in the world. I don't find that particular interesting. What I do find interesting is Japan's gross creditor position. Let's just look at what the Japanese own abroad. From 1980 to 1989, that figure increased from $150 billion to $1.7 trillion, more than a tenfold increase. I would argue that owning assets overseas involves the nation and the society in fundamentally different ways with the world than sitting at home and exporting. Managing assets overseas is, again, a broadening experience and ought to lead to new kinds of trade flows that we have not seen in the past.

And, finally, we find labor markets tightening very rapidly in Japan to the point where other Asians have been flowing into Japan to work, many of them illegally. From our standpoint, the

numbers may still seem rather small, perhaps on the order of 400,000 people. But, from a Japanese standpoint, this is an historic change. This is a society that has regarded itself as both a nation state and a single ethnic group. And to reach the point where even they are willing to have foreigners come and work in their nation in larger numbers suggests the beginnings of a redefinition of what Japan is and what Japanese society is.

All of these are historic changes for Japan and they ought to have a significant long-run impact on Japanese trade behavior in the direction of making Japan more open to imports from the rest of the world. Indeed, as these changes take place, there is a very lively debate in Japan about many of these issues, about the value of imports, that looks as though Japan is moving in a more open direction.

But, I would like to say that, as Japan approaches these changes, there are some very enduring aspects to society and the economy that are likely to moderate or hold back the pace of this change and perhaps, ultimately, the extent of it.

First, Japan remains—in comparison to the United States—very much a group-oriented society. This social behavior pattern is not going to change very much in Japan, and certainly not over the next decade, and suggests to me that Japan will never be as open economically as the United States. Outsiders are outsiders and it's difficult for them to become insiders.

It also implies, by the way, if you're interested in political issues such as the Middle East, that the decision-making process in Japan is likely to remain rather diffuse and slow, which will make it difficult for Japan to play a bigger leadership role in world affairs.

A second thing which has not changed very much, at least in my reading of Japan, is the focus of society on economic issues. Most of the issues which the Japanese think are important and which they put the most of their political and human effort into resolving are economic issues. At one level, for example, we see a relative lack of concern with issues such as human rights in international interactions. There has been, for example, a remarkable lack of concern in Japan over the plight of Chinese students who did not want to be sent back to China but, in most cases, have been kicked out of the country.

It will be difficult for Japan, I think, to move beyond this focus on economics to a broader consideration of political and humanitarian issues in the world. In that context, I think it will also be somewhat difficult for the Japanese to move beyond the rather narrow self-interest they have had in economic issues in the past. One hopes that they will. Some of the changes suggest they're moving in that direction. And, yet, so far, I see relatively little change on that front.

Japan is, for example, a country that continues to have an industrial policy. How much credit we give to industrial policy for affecting competition with American firms is something we could argue about, perhaps. But, the fact remains that, in Japan, society sees a legitimate role for the central government in helping to shape the nature of the economy at a macroeconomic level. I've found it rather amusing to see in Stephen Marks' paper that even as the Japanese government established an import promotion program in

1990, it somehow managed to skew the benefits under the tax provisions so that Japanese manufacturers would be the ones who would benefit.

Or, we can see that, in the $2 billion of foreign aid offered to Eastern Europe this year, $750 million was in the form of insurance for Japanese companies and another $1 billion was in Exim Bank loans and, in this case, I think the Exim Bank loans would have gone primarily to the benefit of Japanese manufacturers.

Or, we could look at Japan's position in Thailand, where we find ODA being used to build infrastructure in industrial parks where Japanese manufacturing firms are going to put their plants. This isn't necessarily a bad thing. It might be good for Thailand. It certainly is good for the Japanese, but it illustrates again a fairly narrow self-interested economic focus as Japan looks out at the rest of the world.

In conclusion, just very briefly, I think we must recognize and encourage the changes that are taking place in Japan, but we shouldn't become overly optimistic. There is no revolution going on in Japan. The constraints are very real, and I agree with Bill Cooper that we are likely to continue to have some fairly substantial problems in our ability to deal with Japan on trade and investment issues on into the 1990s.

Managed trade, in fact, may be an undesirable but unavoidable outcome in particular industries, where the Japanese are determined to use industrial policy to build a domestic industrial base and we are unwilling to see our own industry be dismantled as a result of it.

So I end on that cautious note, that, by and large, there will be no alternative to continuing what we have done in the past, which is to just slog away on an annual basis, trying to get the Japanese to change and hoping that the process of change that's in place now will continue and move in a direction that makes Japan more open to the rest of the world.

Thank you.

[The prepared statement of Edward J. Lincoln follows:]

PREPARED STATEMENT OF EDWARD J. LINCOLN

JAPAN'S FOREIGN TRADE POLICIES AND PRACTICES

Japan continues to be both a stimulating challenge for the United States as well as the object of much frustration and criticism. My testimony concerning developments in Japanese trade policies and practices is based in part on several years of research resulting in the publication this past spring of *Japan's Unequal Trade,* which explores many of these topics in greater depth. While there is much to admire in Japanese success, my conclusion is that much of the criticisms are also valid.

ROOTS OF JAPAN'S SUCCESS IN TRADE

Japanese success in penetrating export markets is largely due to the overall success of the economy. From the 1950s through the early 1970s, Japan's real GNP grew at an average annual rate of 10 percent. Since 1973, the economy has grown at an average annual rate of 4 percent, which is still higher than other industrial nations. The Japanese deserve great credit for their record of growth and the rapid technical change which underlies it.

Much of the productivity growth in Japan has come from technology acquired from abroad and modified in Japan. Nevertheless, American businessmen and researchers are now discovering that important indigenous technological developments have been taking place inside Japanese manufacturing plants concerning the

organization of production. Redefinition of the jobs of workers on assembly lines, quality control circles, revised labor-management relations, new methods of inventory control, and a variety of other aspects of production management have led to substantial cost savings while simultaneously reducing the proportion of defective products in manufacturing. These are important developments which have much to do with the success of Japanese products in international markets.

Other factors have also gone into overall Japanese success, including an emphasis on education (and especially math and science) by parents and government (yielding a well-trained work force), an ample supply of aggressive corporate managers willing to take risks in introducing new products and processes, a lack of rigidity or serious antagonism in labor-management relations, and the willingness of foreign firms to license technology to Japan.

Furthermore, lacking low-cost raw materials, Japan has had nothing to sell to the world except manufactures. It is both fortunate and natural that Japan should have developed into an efficient producer of manufactured goods. Foreigners buy Japanese products largely because they are well engineered and of high quality.

A MERCANTILIST NATION?

Were natural economic developments all that has been involved in Japanese success, then we would only have ourselves to blame for competitive failures. But this is not all of the story. The dilemma we face with Japan is basically an antitrust dilemma; we can respect the Japanese for efficiency, hard work, and excellent products, and still resent the tactics which have accompanied Japanese success in the market. I believe that these tactical problems relate primarily to access to the Japanese market.

Japanese success in export markets is largely due to engineering skill, the reorganization of production discussed above, and other legitimate factors (without denying that aggressive marketing tactics have been involved to some extent as well). Exports as a share of GNP are now at 10 percent—not a particularly high figure, and ought to be higher if the government and industry were aggressively and unfairly pushing exports.

Japanese imports present a very different story. The ratio of manufactured imports has been (and remains) far below the level of other industrial nations. Indeed, it is difficult to find any other nation in the world with a ratio as low as Japan's. Even with some improvement over the past several years, this ration in 1989 was only 3 percent, roughly one-third the level of this ratio in the United States, and the European nations are all well above 10 percent.

Japanese trade is also characterized by very peculiar patterns by industry. One of the important developments in international trade over the past 45 years has been the rapid growth of what economists call intra-industry trade—the two-way flow of products within industries. The United States, for example, is a major exporter of office equipment, but also a major importer of office equipment. Economies of scale in production, product differentiation, and other factors account for the existence and growth of intra-industry trade. Economics have statistical means to measure the degree to which nations engage in this form of trade. By these measures, Japan engages in far less intra-industry trade than any other industrial country (except Australia).

In most cases, the very low level of Japanese intra-industry comes from large exports and few imports within an industry (rather than the reverse). In strong contrast to the United States, Japan imports very little in those industry categories which generate the largest exports. Japan exports motor vehicles, but imports very few; the same is true for office equipment and many other important product areas. In a few areas, such as aircraft, American firms are the beneficiary of low intra-industry trade because Japan imports a great deal and does not export very much, but these examples are very few in number.

Japanese government officials, academics, and business leaders explain away these statistics as the outcome of comparative advantage—if Japan is good at exporting something, why should it import? But Japan's trade patterns are startlingly different from those of other industrial nations. Others have comparative advantage in many of these industries as well, and have still participated in large two-way flows of trade. Explicit and implicit protectionism is a better explanation of why Japan's imports of manufactures are so low and why it engages in so little intra-industry trade.

Behind this protectionism lies the determined effort of the Japanese to catch up with the industrialized nations over the past century. This determination included the strong intention to have an industrial Japan owned, operated, and serviced by Japanese. Policies aimed at achieving these objectives reached their peak in the

early postwar era, severely restricting foreign direct investment in Japan, effectively prohibiting commercial financial borrowing from abroad, and limiting imports of any product that could be manufactured at home. Virtually all of these strong policies have disappeared, but, while they existed, a web of relationships emerged among Japanese firms which have made entry of foreign products difficult in many industries.

This mercantilist past is fully consistent with other features of Japanese society. The Japanese are one of the few nations that still see themselves today as both a nation state and a homogeneous ethnic group. They have had difficulty in accepting foreigners into their society, including refugees from neighboring Asian countries. It is no great surprise that this general sense of social separateness has a counterpart in international trade.

Since 1985, however, the yen has risen strongly against the dollar, resulting in a great deal of discussion within Japan about the benefits of imports. Government publications now openly applaud the role of imports in providing greater variety to consumers and in controlling domestic inflation. Even foreign workers from developing countries have entered Japan seeking employment. A number of government-sponsored price surveys have openly admitted that prices on a wide variety of consumer items are much higher in Japan than elsewhere. Japanese travellers abroad each bring back over $2,000 of merchandise purchased abroad, and travel agencies advertise shopping trips to destinations such as Seoul, South Korea. From 1985 to 1989, the travel and passenger transportation accounts in Japan's balance of payments have deteriorated from a deficit of $5 billion to a deficit of $24 billion as the flow of travellers overseas has mushroomed.

How much change have these developments produced within the Japanese economy and its trade patterns? In my estimation, the changes in the openness of the Japanese market are quite mild and may have run their course. For some products, foreign penetration is visibly larger than a few years ago. For others, the problems have changed little. Problems are likely to remain especially acute for any product in the high-technology area, where industrial policy in Japan is active.

The Structural Impediment Initiative was an innovative attempt to grapple with some of the structural features of the Japanese economy that have fed into the inability of more American products to penetrate the market. One can argue over the appropriateness of some of the choices of items to negotiate, but overall the SII talks did tackle some important problems in Japan. In my view, however, the promises achieved in the SII talks will need a determined follow-up process in order to achieve much success. Even though Japan is more favorably disposed to domestic social and economic change than in the past, these changes are unlikely to work to the benefit of American products unless the U.S. government pushes hard for implementation of specific policies which are to our benefit. Increased antitrust action in Japan that does not address cartel-like activity that has worked to exclude foreign products, for example, would be of little benefit.

There is no doubt that Japanese society is changing in many ways, and that attitudes toward the rest of the world are part of the change. American negotiating objectives with Japan are helped by this movement in a somewhat more liberal and open direction. However, Japan has been so extremely insular in the past that even moderate change still leaves a wide gap between the realities of trade statistics and American expectations for the Japanese market.

JAPAN'S OBJECTIVES AS A WORLD POWER

For the past century Japan's national objective has been relatively simple, and all consuming: catch up with the industrial nations of the West. Japan has now achieved that goal, leaving it without any clear conception of what ought to motivate policy in the future. In the absence of articulation of any new goal, it is no surprise that the same motivations and forces which shaped Japanese policies toward the world in the past still operate. The nation has not yet moved beyond the rather narrow economic self-interest of the past.

There is no sinister plot to dominate world manufacturing as some would have us believe, but the Japanese government does put the economic interests of the nation (and of Japanese corporations) ahead of other international objectives. Humanitarian concerns, larger political issues, and other elements of foreign policy play a relatively minor role in the calculation of Japanese interests and policies.

Divergence between American and Japanese views and policies is quite evident in the context of Asia. While our government is motivated by many factors, including serious thought about how to bring a settlement to the long-term conflict in Cambodia and how to deal with the Tiananmen massacre in China, Japanese policy has a rather clear-cut economic focus.

With respect to China, Japan carefully distanced itself from American policy positions in the wake of the massacre, resumed its existing foreign aid loan program by the fall of 1989, showed scant sympathy to the plight of Chinese students seeking asylum in Japan, and has now inaugurated a new aid program that will dispense roughly $1 billion each year to China over the next 5 years. The desire to build a stronger economic relationship with China has far outweighed concerns over human rights.

Japan's imports from other Asian nations have risen substantially over the last several years, easing a perennial Asian complaint about Japan. Bilateral foreign aid has continued to increase (making Japan the dominant supplier of foreign aid to Asian countries), and a burst of Japanese direct investment is taking place in certain Asian countries (especially Thailand). Japanese activity tends to be bundled in these countries; foreign aid supports infrastructure investments that will benefit Japanese firms building factories, and the private sector has even established an organization (the Japan International Development Organization—JAIDO) in 1989 to obtain foreign aid money to subsidize direct investment activities.

Will this newfound Japanese interest in Asia actually lead to an economic bloc? It is possible, but several factors militate against this development. Asian countries are not eager to enter into confining economic relationships with Japan—although they are increasingly willing to submerge their concerns since the Japanese are such a large source of foreign aid and investment. The United States and Europe are also major traders and investors in Asia, although Asian countries fear that our interest and presence is waning relative to Japan.

The most likely scenario is that a "soft regionalism" will continue to develop, in which Japan builds a preferential position in certain countries and certain industrial areas, but which does not emerge as a formal structure and which does not yield strong overall domination of Asia by Japan. Even this mild regionalism would leave room for considerable conflict with the United States, as American firms could well feel that their ability to sell to other Asian countries is compromised as the Japanese build exclusive ties similar to what prevails in Japan.

CONCLUSION

Japan has done little to articulate a philosophy or set of objectives to guide its foreign policy other than the narrow economic self-interest of the past. All of the Japanese interest in Asia, for example, is one dimensional; just as which China, the Japanese government exhibits little real concern or leadership over human rights, political issues, or resolution of regional conflict. Furthermore, while official documents endorse the existing GATT system (which Japan did not participate in constructing), one gets the strong impression that Japan could readily (and successfully) adapt to a variety of other regimes, including managed trade and regional blocs. Despite Japan's endorsement of the GATT system, the thrust of policy up the present has been to limit imports while claiming that the market is open.

Many in Japan recognize that the policies of the past are no longer appropriate or useful for the nation now that it has achieved a new position in the world. Bookstores in Japan are full of books discussing the future course of the nation, written by both academics and government officials, and many of these contain ideas and positions that are rather liberal and open compared to the past. They acknowledge that Japan, as a major economic power, must play an active leadership role in shaping the international economic and political environment of the future. However, the voice of those who would push Japan in this direction is still not strong enough to make much of a difference in Japan's foreign policy.

Representative HAMILTON. Thank you.

STATEMENT OF MR. ALAN WOLFF, ESQUIRE, DEWEY, BALLANTINE, BUSHBY, PALMER AND WOOD, FORMER GENERAL COUNSEL, USTR

Mr. WOLFF. Thank you very much, Mr. Chairman.

First, I would like to commend the Joint Economic Committee for its decision to hold these hearings on Japan's current and future role in the world economy. Although it's not as sudden or dramatic as the events in Eastern Europe with the collapse of communism or the unification of Germany, I think that it's every bit as much as important. The emergency of Japan as economic super-

power is certainly one of the most important events of the 1980s and 1990s.

Members of this Committee are well aware of the dimensions of Japan's growing economic, industrial and technological power. Japan is now the world's leading creditor nation. Japan is taking the lead in organizing the Pacific Rim economy, which we should be concerned about.

Japan is investing more in plant and equipment than the United States is and more than twice as much per worker, which we have to be concerned about.

Japan has established a leadership position in many key industries and technologies. For example, it is projected to be the world's largest producer of electronics goods in the early 1990s.

And in 12 emerging technologies identified by the Commerce Department, current trends show that the United States is losing badly in four, losing in six, holding in only two and gaining in none. And I'd be happy to submit for the record just that one page from the Commerce Department study that summarizes those results.

These economic achievements are a testament to the hard work of the Japanese people, the management skills of its businessmen, division of its government officials, Japanese workers are among the best educated in the world. The best Japanese companies have long-time horizons, often, but not always, make high-quality, low-cost products and continuously make incremental improvements in product and process technology.

Japan's civil servants are certainly among the best and the brightest and are dedicated to achieving their national objectives. But, Japan also faces growing domestic and international criticism for certain elements of its economic strategy. These practices include informal protection of its home market but, nevertheless, effective protection; industrial targeting and, for example, in electronics products, a propensity to buy market share by selling below cost.

Many Japanese believe that their economic system has emphasized industrial expansion at the expense of a higher standard of living for them. Unfortunately, not enough Japanese feel that way.

Finally, Japan is being criticized for not assuming new international responsibilities commensurate with its increased importance in the world economy. And that's really what I want to focus my remarks on today.

Strengthening the international trading system is the area in which I would see Japan making its most telling contribution, potentially. Japan owes a great deal of its post-War economic success to the creation by the United States of an open multilateral trading system. Ironically, many of Japan's policies have eroded support for free trade, however. Japan's competitors are often caught between Japan's export drives and Japan's restricted home market.

In order to maintain the multilateral trading system, Japan will have to undertake domestic reforms to expand its access to its market and play a greater role in strengthening the GATT.

This will not be at all easy. With the exception of the agricultural sector, Japan's protection is largely informal. Japan's level of intra-industry trade and manufactured imports are substantially

lower than those of the rest of the industrialized world. Although some of this can be attributed to Japan's factor endowments and geographical isolation, there's a great deal of evidence which suggests that these trade patterns are partially due to informal barriers—I would say substantially due to those barriers.

These barriers include the buying practices of industrial groups, the unequal and anti-competitive relationship between manufacturers and their captive distributors, government tolerance of bid-rigging in import cartels, administrative guidance used to protect both sunrise and sunset industries, government procurement, an archaic distribution system protected by the Large Retail Store law, and inadequate protection of intellectual property.

The United States attempted to deal with many of these problems in the Structural Impediments Initiative, SII. Veteran Japan watchers have not yet declared victory, however. As Koso Yamumura put it:

The final report of the SSI is, quote, "replete with promises of laws to be drafted and passed, studies to be made, surveys to be conducted, administrative procedures to be changed and data to be gathered." End quote.

Aside from the vagueness of many of the commitments, ensuring compliance with trade agreements has always been a difficult proposition with Japan. Consider the following passage which appeared in the Japanese press, and I quote:

"The U.S. sides assertion is that because the distribution structure in Japan is complicated, retail prices of goods imported from the United States do not go down. As a result of this, the sales are stagnant and imports from the United States do not increase." End quote.

This story is not, unfortunately, based on coverage of SII. It is a July 5, 1972 story on U.S.-Japanese negotiations to liberalize the Japanese distribution system. And I would suggest to our negotiators that those who forget history are condemned to repeat it. We've been at this a very long time trying to open up the various aspects of the Japanese community, economy, and I have some suggestions to make at the end of my testimony about how we might pursue things a little bit differently.

Unfortunately, 2 years after then President Nixon and Prime Minister Tanaka reached an understanding on the Japanese distribution system, Japan passed the law we're now trying to get liberalized, the Large-Scale Retail Store law, which gave small shopkeepers effectively a veto power over new retail outlets, over 500 square meters.

There are a number of benchmarks which could be used to determine how rapidly Japan is becoming more open to the outside world. These include:

First, an increase in manufactured imports as a percentage of gross domestic product, currently under 3 percent. And if you look at the rate of change over time, there hasn't been any.

An increase, secondly, in foreign direct investment in Japan as a share of total assets. It now accounts for less than 1 percent.

Third, a reduction in the 40 percent price gap between Japanese and world prices in many areas.

And, fourth, greater levels of two-way trade within product sectors. This is the so-called adversarial trade that Peter Drucker points to, that Japan tends not to import the same kinds of goods that it exports.

And, fifth, progress must be measured in results, not in terms of agreements on process.

Japan must realize that there is a difference between mutual inter-dependence and asymmetrical dependence. Japan cannot expect other nations not rely on Japanese products while it continues to enhance its own autonomy.

For example, the United States, already nervous about Japanese predominance in certain advanced memory devices in the semiconductor area, finds the Japanese industry and government now targeting microprocessors with its Tron program, one of the areas of U.S. strength in semiconductors.

Japan must also recognize that internationalization of its economy involves more than increasing imports from its foreign subsidiaries.

Media has directed the 50 largest Japanese exporters to double their imports over the next 3 years. But, many of these companies plan to do so by shifting some of their production overseas. This may increase employment in the host country, but it will not result in greater access to the Japanese market by foreign companies.

One area where Japan could do much than it has is the current round of Multilateral Trade Negotiations. Although Japan has an enormous stake in an open trading system amongst the largest of any in the negotiations, Japan has not done a great deal to advance the Uruguay Round. It appears to be primarily interested in avoiding any commitments with respect to the liberalization of its rice market and weakening the Antidumping Code and U.S. Trade Laws, such as Section 301 and our Antidumping Law.

The other speakers have alluded to increasing Japan's role in assisting developing countries and I would subscribe to those views. My written statement addresses that. I would just, in this context, like to raise one point.

And that is that an increased responsibility in the area of economic development is certainly preferable to an expansion of Japan's military forces. I think the current U.S. policy is shortsighted with respect to what we're seeking from the Japanese in the Middle East. We are asking Japan to take up the wrong burden by directing its attention to direct service in the Middle East. And it's an example, I would submit, of the corruption of our policy purposes and objectives where our foreign policy objectives are being undermined by our financial problems.

There is a problem, and Mr. Lincoln alluded to it, in the use of Japanese aid in Thailand, for example, that Japan's programs may be aimed to great an extent at building an infrastructure for Asian export bases for Japanese subsidiaries or joint ventures. As the London Economist put it:

These programs seek to, quote, "expand the Japanese economy beyond the country's geographical borders." End quote.

It is uncomfortably close to a greater Japan mentality and warrants continuing attention by all of Japan's trading partners. And I would stress that point, that the numbers we're looking at are no

longer perhaps the right numbers with respect to trade balances with Japan for Japan's progress in internationalization. If it's intra-company trade we are looking at to a larger and larger extent, then there is not the liberalization that we are seeking to quite the degree that the Japanese government would have us believe.

My written statement also talks about Japan's programs in science and technology that continue to be a problem in terms of targeting. And I will refer to that in questions, time permitting.

Let me sum up by turning to Japan's vision. It strikes me that Japan's conception of its place in the world is still very unclear. As Susan Chira of the New York Times observed, quote:

"Japan remains a reluctant power, unsure of its place, fearful of speaking out too loud, deeply adverse to ideology and committed to economic pragmatism." End quote.

In fact, one Japanese journalist notes that:

Many Japanese opinion-leaders believe that, quote:

"The best thing for Japan to do is nothing, and say nothing towards other countries except in regard to the economy, and to remain without policies. Such statements as it is a kind of arrogance to hold such a philosophy as to how to reconstruct the world and we ought to try to suppress communism or spread democracy." That's one statement.

And a second statement:

"Even if a leader of some country or other were to start a mass massacre of his own people, it ought not to be a matter of any concern to Japan."

That's the second statement.

Most eloquently expressed, "Japan's lack of policies internationally." End quote.

However, Japan is too large and important to treat its international environment as a given. As I noted earlier, international support for open and nondiscriminatory trade will erode unless Japan undertakes fundamental reforms in its trade and economic policies. It remains to be seen whether Japan's leaders are convinced that these reforms are necessary or whether they can carry them out if they are convinced.

In a 1986 interview, then MITI Vice Minister, Makodo Kuroda said that:

"Foreigners are always claiming that a trade crisis was just around the corner and that time was running out."

"Yet," Mr. Kuroda said, "the Earth still turns."

Reliance on gaiatsu, that is foreign pressure to drive Japan's decision-making, will not continue to be as effective over time. Moreover, it creates its own counter force within the Japanese economy, the Japanese political structure to Japan's integration into the world economy.

Each round of forced liberalization tends to lead to more and more mutual resentment. Just as Japan has had to shift from export-led growth to rely more on domestic demand, there needs to be a move in Japan to domestically-driven change rather than foreign pressure-driven policies.

The United States should not over-estimate its ability to influence Japan's domestic and international choices, but if the United

States can help make Japan a full partner in the international institutions the U.S. has led, these institutions will continue to grow and flourish in the post-War Era, an era of increasingly shared leadership.

Japan must, I would submit, search for a national purpose that is broader than the expansion of its industrial system. Certainly, the Japanese consumer is increasingly interested in enjoying a standard of living commensurate with Japan's economic accomplishments. Japan's leaders are aware that Japan will not become, quote, "a respected member of the international community," end quote, a goal enshrined in its post-War Constitution, unless Japan embraces and acts upon enlightened and at least partly selfless goals.

This is where Japan's self-interest lies.

Let me just depart from my prepared remarks for a moment to say as a conclusion that you, I assume, are looking for what the Executive and the Legislature should do together.

One, form an inter-agency task force on Japan to define where U.S. interests clearly lie. There is an effort from time to time within the U.S. government, but it is not as consistent as it should be and its focus is not quite the right one at all times.

Second, there should be rigorous interactive congressional oversight. This process will not occur without you.

Third, the policy should be results-oriented. I gave in my remarks several measures, including percent of imports as it relates to gross domestic product, price levels in the two economies, the greater levels of two-way trade within product sectors, agreements on results, not process; greater foreign direct investment in Japan as a share of total assets. There need to be some results that are laid down as the objective measures of progress and that can be product sector by product sector where appropriate, where our goods and the goods of other countries are not doing as well in the Japanese market as they are doing in other markets, because of the composition of the trade matters. It's not just the overall balance.

Fourth, there should be an ongoing review of problem areas. The National Trade Estimates is beginning to attempt that.

And, fifth, a review of existing agreements. The Trade Agreements Compliance Act, introduced on the Senate side by Senators Baucus and Heinz and on the House side by Representatives Matsui and Nancy Johnson, is one approach to agreeing to following what has been agreed to, not only with Japan, but with other countries so that we look over our shoulder as to what we've achieved in writing, in any event, and see that it becomes reality.

Thank you, Mr. Chairman, Mr. Scheuer.

[The prepared statement of Alan Wm. Wolff follows:]

PREPARED STATEMENT OF ALAN WM. WOLFF

I want to commend the Joint Economic Committee for its decision to examine Japan's current and future role in the world economy. Although not as sudden as the collapse of communism in Eastern Europe or the unification of Germany, the emergence of Japan as an economic superpower is certainly one of the most important events of the 1980s.

Members of this Committee are well aware of the dimensions of Japan's growing economic, industrial and technological power:

- Japan is now the world's leading creditor nation, with a net foreign asset position of $300 billion.
- Japan is taking the lead in organizing the Pacific Rim economy.
- Japan is investing more in plant and equipment than the United States is, or more than twice as much per worker.[1]
- Japan has established a leadership position in many key industries and technologies. Japan, for example, is projected to be the world's largest producer of electronics goods in the early 1990s.[2] In twelve emerging technologies identified by the Commerce Department, current trends show the U.S. is losing badly in four, losing in six, holding in two and gaining in none.[3]

These economic achievements are a testament to the hard work of the Japanese people, the management skills of its businessmen, and the vision of its government officials. Japanese workers are among the best-educated in the world. Japanese companies have long time horizons, make high-quality, low-cost products, and are continuously making incremental improvements in product and process technology. Japan's civil servants, the "best and brightest", are dedicated to achieving national objectives.

But Japan also faces domestic and international criticism for certain elements of its economic strategy. These practices include informal protection of its home market, industrial targeting, and (in electronics products, for example) a propensity to buy market share by selling below cost.[4] Many Japanese believe that their economic system has emphasized industrial expansion at the expense of a higher standard of living. Finally, Japan is being criticized for not assuming new international responsibilities commensurate with its increased importance in the world economy.

JAPAN AND THE INTERNATIONAL SYSTEM

Strengthening the international trading system is the area in which Japan could make its most telling contribution. Japan owes a great deal of its postwar economic success to the creation of an open, multilateral trading system. Ironically, many of Japan's policies have eroded support for free trade. Japan's competitors are often caught between the "rock" of an export drive and the "hard place" of a closed Japanese market. In order to maintain the multilateral trading system, Japan will have to undertake domestic reforms to expand access to its market, and play a greater role in strengthening the GATT.

This will not be easy. With the exception of its agricultural sector, Japan maintains little *formal* protection. Japan's levels of intra-industry trade and manufactured imports, however, are substantially lower than the rest of the industrialized world. Although some of this can be attributed to Japan's factor endowments and geographical isolation, there is a great deal of evidence which suggests that these trade patterns are partially due to "informal" barriers.[5]

These barriers include the buying practices of industrial groups, the unequal and anticompetitive relationship between manufacturers and their captive distributors, government tolerance of bid-rigging and import cartels, "administrative guidance" used to protect both sunrise and sunset industries, government procurement, an archaic distribution system protected by the Large Retail Store Law, and inadequate protection of intellectual property.

The United States attempted to deal with many of these problems in the recently concluded Structural Impediments Initiative. Veteran Japan-watchers have not yet declared victory, however. As Kozo Yamamura put it, the final report of the SII is:

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[1] According to DRI, Japanese investment in plant and equipment in 1989 was $559.9 billion, versus $513.9 billion for the United States. Kenneth Courtis, senior economist with Deutsche Bank Capital Markets, estimates that 30 percent of new capital investment is aimed at the development of new products and services, another 30 percent is targeted at new processes of product development, design, production and distribution, and 40 percent is directed toward capacity expansion. As a result, Courtis conclude, "new products will increasingly be developed and launched first in Japan." Kenneth S. Courtis, "Japan Sets The Challenge", Tokyo, January 17, 1990.

[2] U.S. Department of Commerce, International Trade Administration, *The Competitive Status of the U.S. Electronics Sector,* April 1990.

[3] U.S. Department of Commerce, Technology Administration, *Emerging Technologies: A Survey of Technical and Economic Opportunities,* Spring 1990.

[4] In the 1980s, Japanese electronics companies dumped microwave ovens, pagers, cellular mobile phones, semiconductors, color picture tubes, 3.5" microdisks, digital readouts, small business telephone systems, and are alleged to be dumping flat panel displays.

[5] See, for example, Edward J. Lincoln, Japan's Unequal Trade, (Washington, DC: Brookings Institution, 1990).

"[R]eplete with promises of laws to be drafted and passed, studies to be made, surveys to be conducted, administrative procedures to be changed, and data to be gathered." [6]

Aside from the vagueness of many of the commitments, ensuring compliance with trade agreements has always been a difficult proposition. Consider the following passage which appeared in the Japanese press:

The U.S. side's assertion is that because the distribution structure in Japan is complicated, retail prices of goods imported from the U.S. do not go down. As a result of this, the sales are stagnant, and imports from the United States do not increase.[7]

This story was not, as one might imagine, based on coverage of SII. It is a July 5, 1972 story on United States-Japanese negotiations to liberalize the Japanese distribution system. Unfortunately, 2 years after then President Nixon and Prime Minister Tanaka reached an understanding on the Japanese distribution system, Japan passed the Large-Scale Retail Store Law, which gave small shopkeepers in Japan veto power over any new retail outlets over 500 square meters.

There are a number of benchmarks which could be used to determine how rapidly Japan is becoming more open to the outside world. These include:

- An increase in manufactured goods imports as a percentage of GDP (currently under 3 percent);
- An increase in foreign direct investment in Japan as a share of total assets (it now accounts for less than 1 percent);
- A reduction in the 40 percent price gap between Japanese and world prices; and
- Greater levels of two-way trade within product sectors. (Japan tends not to import the same goods it exports.)

Japan must realize that there is a difference between mutual interdependence and asymmetrical dependence. Japan cannot expect other nations to rely on Japanese products while it continues to enhance its own autonomy. For example, the United States, already nervous about Japanese predominance in certain advanced memory devices, finds the Japanese industry and government now targeting microprocessors with its TRON program, one of the areas of U.S. strength in the semiconductors.

Japan must also recognize that "internationalization" of its economy involves more than increasing imports from its foreign subsidiaries. MITI has directed the 50 largest Japanese exporters to double their imports over the next 3 years, but many of these companies plan to do so by shifting some production overseas. This may increase employment in the host country, but will not result in greater access to the Japanese market by foreign companies.

One area where Japan could do much more than it has is the current round of multilateral trade negotiations. Although Japan has an enormous stake in an open trading system, Japan has not done a great deal to advance the Uruguay Round. It is primarily interested in (a) avoiding any commitments with respect to the liberalization of its rice market; and (b) weakening the Antidumping Code and U.S. trade laws such as Section 301.

ASSISTANCE TO DEVELOPING COUNTRIES

In addition to strengthening the international trading system, Japan should also play a greater role in boosting the economic growth of developing countries. Japan could recycle more of its current account surplus, help finance Third World debt relief, step up technical assistance, improve the quality of its development assistance, and increase contributions to international financial institutions such as the World Bank and the International Monetary Fund. In general, Japan should rely more heavily on multilateral institutions to administer its development assistance.

An increased responsibility in the area of economic development is certainly preferable to an expansion of Japan's military forces. Japan's neighbors are very wary of any signs of remilitarization. They want to be consulted on any movement of Japanese troops to the Gulf, even if they are unarmed in the Gulf, they and under U.N. flag.

But we should recognize that "burden sharing" will inevitably lead to "power sharing." If we ask Japan to step up its contribution to the IMF or the World Bank,

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[6] Kozo Yamumura, in Kozo Yamumura, "Will Japan's Economic Structure Change? Confessions of A Former Optimist" *Japan's Economic Structure: Should It Change*, (Seattle: University of Washington Press, 1990), p. 54.

[7] *Asahi*, July 5, 1972.

they will have a greater say in how those institutions are run. This is natural and acceptable, provided that Japan shares the aims of these institutions.

Discussions within Japan about its role in the development of the Asia-Pacific region give some insights into how Japan intends to use its economic influence. Japanese officials often use a "flying geese" metaphor to describe the region. Japan is at the head, supplying capital, technology and advanced consumer goods, while the Asian-NICs and ASEAN countries follow, supplying Japan with natural resources, food, and less sophisticated manufactured goods. A 1988 study commissioned by the Economic Planning Agency suggested the creation of an "Asian Brain", a coordinating mechanism to control flows of Japanese direct investment to the region to determine who produces what. According to the study, "coordination of each country's commercial policy" and "specialization in selected industries" is necessary to stop protectionism from occurring in the region.[8]

Japan has developed a number of programs, such as the New Asian Industrial Development Plan and the Japan ASEAN Investment Corporation, to coordinate trade, aid and private capital. These initiatives are not directly tied to Japanese exports, but are building the infrastructure for Asian export bases for Japanese subsidiaries or joint-ventures. As the *Economist* put it, these programs seek to "expand the Japanese economy beyond the country's geographical borders." [9] It is uncomfortably close to a "Greater Japan" mentality, and warrants continuing attention by Japan's trading partners.

SCIENCE AND TECHNOLOGY

Japan is also considering new initiatives in the area of science and technology, such as increased funding of basic research, research on global problems such as energy conservation and the environment, and allowing greater foreign participation in government-sponsored R&D. In 1986, then Prime Minister Nakasone unveiled the Human Frontiers Science Program, a 20-year international project in the life sciences. Foreign researchers are currently receiving two-thirds of the research grants. IBM and CFS Thompson are participating in an institute on fuzzy logic; GE and United Technologies have been invited to join a MITI consortium to develop jet engines for Mach 5 aircraft.[10]

Japan's efforts to increase international cooperation in science and technology has not always gone smoothly. Japan's attempt to sponsor a 10 year $1 billion international effort on factory automation (Intelligent Manufacturing Systems) has run into problems because Japan selected areas where it was still weak, such as software and systems integration. Some observers questioned whether this was a disinterested effort to enhance international cooperation, or another exercise in industrial targeting.

JAPAN'S VISION

Japan's conception of its place in the world is still quite murky. As the Susan Chira of the New York Times observed, "Japan remains a reluctant power, unsure of its place, fearful of speaking out too loud, deeply averse to ideology and committed to economic pragmatism." [11] One Japanese journalist notes that many Japanese opinion leaders believe that:

"[T]he best thing for Japan is to do nothing and say nothing toward other countries, except in regard to the economy, and to remain without policies. Such statements as, "It is a kind of arrogance to hold such a philosophy as how to reconstruct the world, and we ought not to try to suppress communism or spread democracy" and that "Even if a leader of some country or other were to start a mass massacre of his own people, it ought not to be a matter of any concern to Japan," . . . most eloquently express Japan's lack of policies, internationally.[12]

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[8] The report, which is entitled *Promoting Comprehensive Economic Cooperation in an International Economic Environment Undergoing Upheaval: Toward the Construction of an Asian Network*, is cited in David Arase, "U.S.-Japan Trade Ties And Japan's Role In The Asia-Pacific", October 1989.

[9] Paul Maidment, "The Yen Block", *The Economist*, July 15, 1989.

[10] John Choy, "1990 Update On Japanese Research And Development", *JEI Report*, No. 37A, September 28,1990.

[11] Susan Chira, "Japan Ready to Share Burden, But Also the Power, With U.S.", *New York Times*, March 7, 1989.

[12] Cited in Yoshihisa Komori, "Criticism Against Japan's Neo-Nationalism", *Chuo Koron*, March 1990.

In any event, Japan is simply too large and important to treat its international environment as a given. As I noted earlier, international support for open and non-discriminatory trade will erode unless Japan undertakes fundamental reforms in its trade and economic policies.

It remains to be seen whether Japan's leaders are convinced that these reforms are necessary, or whether they can carry them out if they are convinced. In a 1986 interview, Makoto Kuroda said that foreigners were always claiming that a trade crisis was just around the corner and that time was running out. Yet, as Kuroda said, "'The earth still turns." Reliance on gaiatsu (foreign pressure) to drive Japan's decision-making creates its own counterforce within Japan to its integration into the world economy. Each round of forced liberalization leads to more and more mutual resentment. A shift in Japan's priorities and current economic strategy is also made more difficult by Japan's political structure: the lack of a strong executive, bureaucratic sectionalism in areas where ministerial jurisdiction is not clearly defined, and powerful interest groups.[13]

Most Japanese opinion-makers insist that Japan will continue to support the United States and the economic and security system the United States has constructed in cooperation with its allies and trading partners. One blue-ribbon panel went so far as to say that Japan should offer technical assistance on industrial policy, since the erosion of America's industrial base and the decline of American hegemony threatened the stability of the international system.[14]

In public documents, the Government of Japan insists that it, in addition to supporting the universal ideals of democratic government and a market economy, it will develop ideals based on its own unique experiences. For example, Japan believes that it can help developing countries because of its recent and rapid industrialization, give advice on pollution and other problems accompanying economic growth, and serve as a bridge between the Asia-Pacific region and the industrialized world.[15] Japan can and should accomplish these objectives in a way that supports an open, multilateral trading system.

The United States should not over-estimate its ability to influence Japan's domestic and international choices. But if the United States can help make Japan a full partner in the international institutions the U.S. has led, these institutions will continue to grow and flourish in the postwar era—an area of increasingly shared leadership.

I assume that Japan will be searching for a national purpose that is broader than the expansion of its industrial system. Certainly, the Japanese consumer is increasingly interested in enjoying a standard of living commensurate with Japan's economic accomplishments. Japan's leaders are aware that Japan will not become "a respected member of the international community", a goal enshrined in its postwar constitution, unless Japan embraces and acts upon enlightened and selfless goals. This is where Japan's self-interest lies.

Representative HAMILTON. Well, thank you very much, gentlemen, for excellent statements. We appreciate it very much.

Now, I just have in front of me here a poll some months ago, weeks ago, not too far out of date. It says:

About 70 percent of the Americans believe that Japan has already passed the United States as an economic power.

And I think most of us in the Congress would observe that our constituents are very impressed with the Japanese economic success, very fearful of the Japanese economic challenge. And that poll would suggest that I may be right about that.

How serious do you think this economic challenge is from the Japanese? Put it in some kind of perspective for me. Is this some-

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[13] See Kent Calder, "Japanese Foreign Economic Policy Formation: Explaining the Reactive State", *World Politics*, Vol. 15, No. 4 (July 1988).

[14] "Japan must work toward helping to lay the foundations for a new global economic order by lending cooperation to the revitalization of the US economy and industry . . . A Wise Men's group on industrial restructuring . . . could contribute much to the revitalization of the US economy and industry by translating Japan's own experiences in restructuring it industries into the context of US industrial restructuring." Masataka Kosaka, *Japan's Choices*, (London: Pinter Publishers, 1989), p. 34.

[15] Industrial Structure Council, 1990s Policy Committee, International Economic Affairs Sub-Committee, "Japan's Responsibilities and Initiatives Approaching the New Century", May 1990.

thing that we need to mobilize the United States government, private sector on? Or, is this one of many challenges facing the United States?

How do you put it in perspective here? We've got a lot of problems on the national agenda.

Mr. COOPER. Mr. Chairman, I think that the poll that you cited does indicate the importance of the economic challenge to Japan, just the fact that Americans themselves perceive that Japan is an economic threat means that it deserves some attention.

Japan has made great strides economically in the last two decades.

Representative HAMILTON. Well, you wouldn't agree with the proposition that it's passed us as an economic power, would you?

Mr. WOLFF. Well, in some sectors, it has become more competitive.

Representative HAMILTON. I know in some sectors, but I'm talking about overall.

Mr. COOPER. I think Japan has economic problems.

Representative HAMILTON. Who is the economic superpower? United States or Japan?

Mr. COOPER. In terms of the GNP, the U.S. is still number one. Japan is number two. It surpasses the Soviet Union.

Representative HAMILTON. And they are coming hard?

Mr. COOPER. They are coming hard, although I would say that that trend is decreasing. Japan's economic growth certainly is not as fast as it was in the fifties and sixties, and even in the seventies. And the GNP, it is still growing. It is growing faster than the U.S.

Representative HAMILTON. They are slowing down?

Mr. COOPER. They are slowing down.

Representative SCHEUER. How about the per capita GNP.

Mr. COOPER. The per capita GNP is increasing very rapidly given the current exchange rates. However, there is a school of thought that—among economists—that Japan's growth is attributable in large part to the fact that it has been catching up with other countries, that it has been rebuilding in a sense the destruction from World War II. And that it was able to, in order to build up, it was able to use technology and know-how that was available. And that now that it has reached a stage of catching up that it has to develop it's own know-how or it has to get new know-how and invest in R&D. And that is the trend in its economic growth.

Actually, decrease, if not level off. What Japan is doing is not surpassing the U.S. but catching up with the U.S.

Representative HAMILTON. So, the economic challenge you were talking about is not all that great? Is that what you conclude?

Mr. COOPER. I certainly think it is great, but I think it has to be put in perspective. Also, too, I think, if you look at Japan's economy as a whole, again, in some sectors it is very competitive.

Representative HAMILTON. Some people say that, by the end of this decade, they will surpass us as an economic power.

Do you agree with that?

Mr. COOPER. I would say no. I think what is happening with Japan, with the U.S. and with the European Community is that we are all splitting the economic pie more evenly. After World War II,

the U.S. definitely was the leader because of the position that it held after World War II.

Representative HAMILTON. Do you think the major challenge comes from the European community or Japan?

Mr. COOPER. I think the European community is a challenge in itself. I think Japan is perhaps a greater challenge. But, that the three areas—the United States, Japan and the European Community—will be sharing more of the economic pie.

Representative HAMILTON. Mr. Lincoln, how do you view these questions I have been putting to Mr. Cooper?

Mr. LINCOLN. I'm not sure I want to answer the question. I think we have reached the point where we are an economic superpower and so is Japan, and we are probably close enough that being able to say one is higher than the other becomes impossible.

There are too many cultural variables that come into making a comparison. I would rather live in the United States, for example. But, that is probably because we have used our economic power to divvy up our pie in a way that consumers and homeowners have a fairly comfortable life in this country.

The Japanese have not given such a good deal to consumers and homeowners. People live in small houses; they have long commutes to work; they pay higher prices for consumer goods.

Representative HAMILTON. Quality of life is better here.

Mr. LINCOLN. From my standpoint, it is. But, I think that we have again reached the point where most—maybe not most, but certainly many Japanese would not agree with that any more. They have low crime rates, they have clean cities, they don't have garbage strikes. They don't have very many murders in their society. And, to them, those are important aspects of an environment to live in.

Representative HAMILTON. Do you think the Japanese economy will be larger than ours by the end of the decade?

Mr. LINCOLN. Absolute GNP, probably not. But, if they were as large as us in terms of GNP, they would have a per capita GNP almost twice as high. That is unlikely to happen.

I think that what we ought to do is have the economic well-being of our society a higher priority among the many priorities that we have in our society. I'm not convinced that we ought to be doing it because we are afraid the Japanese might pull ahead of us. We are not poor if the Japanese become richer. We are still becoming richer, they just happen to become even richer at a higher rate.

But, we ought to be concerned about ourselves and think about whether we are happy with the future growth path that we have for our society. And if, in fact, we think that the Japanese are doing something different or better than we are that has helped them out in this game of making us all better off, then we ought to pay attention to it.

Representative HAMILTON. Mr. Wolff, how do you respond to this general line of questioning?

Mr. WOLFF. I would say the size of GNP is not the key issue. We don't feel threatened by Europe in the same way as we do by Japan. And there is a reason for that.

Japan marshals its national resources for commercial ends and, when it does so, it causes a great deal of injury to other economies, including our own.

We don't consider Iraq a super power, but it certainly has gotten our attention lately by concentrating forces in one particular spot. While comparisons of that sort are peculiarly odious, Japanese industry has concentrated its resources in a particular area. The way we marshal national resources for a space program, they marshal their national resources for supercomputers or mainframes or flat panel displays or semiconductors.

Representative HAMILTON. We often say that high-tech, the new emerging technologies and all the rest are what we've got to pay attention to. What drives the future growth of the American economy? You cite in your statement this Commerce Department report, which is just awful from the standpoint of the United States, losing in four—losing badly in four—losing in six, holding in two, gaining in none.

That is just awful, isn't it?

Mr. WOLFF. Are in deep trouble.

Representative HAMILTON. We are in deep trouble on these emerging technologies, aren't we?

Mr. WOLFF. And we're not paying much attention to it as a nation. As Mr. Lincoln was saying, it is not part of our priorities.

Representative HAMILTON. Here is a country that doesn't pay much attention, as you say, to all of these emerging technologies. Mr. Lincoln and Mr. Cooper don't seem to be overly-exercised about this. They think the challenge is serious but nothing to really be exercised about.

This is a pretty serious matter, isn't it, if we are losing all of this lead in the emerging technologies? That means our economy is not going to have the thrust and drive to it. Isn't that what it means?

Mr. WOLFF. I think it is a question of our national security, it is a question of the economic well-being of future generations in the United States. Our place in the world is dependent on how well we do in manufacturing, and also services. I would not exclude services either.

The Japanese now have many of the largest financial institutions in the world. And, again, it is a concentration of economic power. It doesn't mean that every Japanese is richer than each American. That is not true.

But, you put together the economic power in a concentrated form and it means that banks will see the dumping of financial services just as manufacturers have seen the dumping of goods.

Representative HAMILTON. Mr. Lincoln, you were flat-out. You said a moment ago Japan is a protectionist market. And I gather all of you agree with that.

Is that correct, Mr. Cooper? Do you agree with that?

Mr. COOPER. Japan has had—yes, sir.

Representative HAMILTON. Is Japan the most protectionist market in the world in terms of industrial economies? Is it, by far, the worst offender? Mr. Wolff?

Mr. WOLFF. Without question.

Mr. LINCOLN. Among the industrial nations, yes.

Representative HAMILTON. No doubt about it.

Mr. LINCOLN. No doubt about it.

Representative HAMILTON. So it is not just the United States that has trouble penetrating that market. It is all of the other industrial economies as well.

Is that right?

Mr. LINCOLN. That is correct.

Representative HAMILTON. And then I was interested in the strategy that we use. Mr. Wolff, you used the Japanese phrase that is new to me. What is that phrase? Gaiatsu?

Mr. WOLFF. Gaiatsu, foreign pressure.

Representative HAMILTON. To a casual observer of this U.S.-Japanese relationship over a period of years, it just seems to me constantly that we have got these negotiations going on. We change the name of them from time to time. We are always trying to get more access to the Japanese market. You kind of have a pattern. Frictions rise between the United States and Japan on trade. We finally decided we've got to do something about that, so we get the trade negotiators together. They work hard for a long period of time. They conclude a meeting and they all declare success. And as a result of that, we think the situation is improved, and then we pick up the figures a few months later and we find the trade deficit is still horrendous and the pressures begin to rise again and you kind of repeat the pattern over and over again.

Where is—I think, Mr. Lincoln, you said that you don't see any other strategy except to do that, to continue trying that. But there is a sense of déjà vu all over again, isn't there, in this?

And, yet, you think that is the right strategy? Is this the way we ought to proceed?

Mr. LINCOLN. Well, one thing that hurt us through at least the first half of the 1980s, as Bill Cooper has pointed out, the macroeconomic conditions were simply moving in the wrong direction to be able to show any progress from trade negotiations.

While we were trying to get markets opened at a macroeconomic level, the overall movement of our two economies was in the opposite direction. Since that time, we have at least begun to move in the right direction on the macroeconomic issues.

There is, as I say, a lively debate going on in Japan which suggests that at least moderately we ought to have more success than we have had in the past in trying to get some markets open. Semiconductors, probably not. But, some markets.

I think we are beginning to see some changes in Japan.

Representative HAMILTON. Do you think that this strategy of ours that we have wrestled with and kept at for so long is basically the right strategy?

Mr. LINCOLN. Strategy in the sense of saying that the strategy of trying to get the Japanese to change, to be more open——

Representative HAMILTON. More access to their markets.

Mr. LINCOLN. Right. In terms of tactics, I would thoroughly agree with many of the things that Alan Wolff suggested at the end of his remarks.

Representative HAMILTON. I think——

Mr. WOLFF. I think you are right, Mr. Chairman, that there has to be a more coherent approach. I think that the Administration is trying that through the structural impediments, but there is too

much depending upon very long-term slow reforms when we need to see a greater rate of change.

Representative HAMILTON. The trade balance is coming down. The trade deficit is coming down. Mr. Cooper pointed that down. Down to what, did you say? Thirty-nine?

Mr. COOPER. Yes, sir, that is based on annualized figures for the first seven months.

Representative HAMILTON. It was $56 billion a while back. And is the trend line now down to the rest of this decade, do you think?

Mr. COOPER. I cannot predict what is going to happen the rest of the decade.

Representative HAMILTON. What are the fundamental forces of rating here? Would we expect to see that trend line coming down or can't you tell? Could it also jump up to $60 billion next year?

Mr. COOPER. Well, it could certainly jump up next year or the following year.

Representative HAMILTON. We really haven't looked to the problem. It is the trend for the time being.

Mr. COOPER. Yes, sir.

Representative HAMILTON. Five years from now, would you expect it to be at $40 billion?

Mr. COOPER. I'm afraid that I couldn't predict one way or the other.

Representative HAMILTON. You cannot predict that.

Do you have any sense of that movement, Mr. Lincoln?

Mr. LINCOLN. There is an important variable we have to keep in mind here, which is the exchange rates. And the way in which we have gotten the trade imbalance to improve with Japan over the past 5 years is through a substantial depreciation of the dollar. That was a necessary depreciation given the differences, say, in productivity trends in manufacturing that we have had with Japan increasing productivity faster than we have.

If that trend continues, if Japan continues to have a higher rate of productivity growth, then we can have a falling trade imbalance with Japan all through the 1990s, but only with a continuous depreciation of the dollar.

And we might not like the consequences of that. If we want to start feeling poor in the world, that is one way to do it.

Representative HAMILTON. Mr. Wolff, do you think that trade balance is going to improve through the decade for us? Is it going to improve?

Mr. WOLFF. I would think there would be some improvement. There is some liberalization going on in Japan, to be sure. And there is movement offshore of Japanese manufacturing, which means that we will get our autos from Ohio that are Japanese rather than Japan. That will affect trade balances every place.

The same thing is happening in Europe with Japanese investment. The question will be:

Are their companies behaving? Are they only buying from Japanese parts suppliers? Are they buying equally from Americans?

So the balance is going to be less and less if a good indicator is the degree of internationalization of the Japanese economy or integration into the world economy of Japan.

Representative HAMILTON. The United States would you say is the most open market in the world?

Mr. WOLFF. Without doubt, yes.

Representative HAMILTON. And that raises a question. I find this among a lot of my constituents. They have a simple solution to the trade problem. And I want you to comment on it.

Maybe, it is too simple but you have had a lot of experience in the trade business.

The simple solution, in effect, is reciprocity. We will open up our markets only to the extent that they open up their markets. No more/no less. Reciprocity. Tit for tat.

Why isn't that a good trade policy?

Mr. WOLFF. I think it is a good trade policy. I think it has to be broadly defined. That doesn't mean dollar for dollar, product for product in this same——

Representative HAMILTON. We have not followed that trade policy in the past.

Mr. WOLFF. We have not been tough enough in our policies toward a number of trading partners.

Representative HAMILTON. Do you think we ought to get tougher and begin to say to Japan:

OK, we are going to start closing off some of these things to you. You're not going to have access to our market like you do today unless you shape up over there.

Mr. WOLFF. I am afraid that is, in fact, the lesson from all of our experience with Japan. It would be nice to think that there is a consumer movement in Japan that is growing in strength. And I think there is some consumer sentiment over there that wasn't there before. I don't think we can rely solely upon that. I think it has to be based on reciprocity.

Representative HAMILTON. Is that all right with you, Mr. Lincoln?

Mr. LINCOLN. I must admit that all of my economics training works against the notion of reciprocity, the problem being let's suppose that there is equal access to markets, but it turns out that the market is different. And people in one country simply don't want to buy products at a different manufacturer, which creates a problem.

Nevertheless, as a matter of negotiation with Japan, I think that I have been beating my head against the problem with Japan long enough that, by and large, I am willing to go along with that. And, in fact, that a general sense of reciprocity is almost assumed within the GATT system, the idea that as we all start to open up markets that it was assumed that this would be reflected with rising presence of our goods in at least some markets.

And we haven't seen as much of that in Japan as we ought to.

Representative HAMILTON. I've got some other questions.

But, Mr. Scheuer?

Representative SCHEUER. Thank you very much, Mr. Chairman. This is all a very bleak picture that you are giving to us. First, you tell us—we were told the other day—that Japanese GNP is about half of our GNP and it is substantially smaller, about $115 million.

And that gives them a substantially greater per capita GNP. And it was predicted by the end of the decade that their GNP

would be 80 percent of ours. That is an incredible jump in per capita GNP. Way, way ahead of ours.

Then, you tell us, and I think you're right, that there is no evidence from the past history that the Japanese are interested in adopting our ways in terms of openness of market. Our anti-trust philosophies, and so forth.

And I say this without being judgmental about the Japanese. I am not saying that this is good or bad. They aren't like us. According to the three of you, there isn't any evidence that they intend to try to become like us. They are very different.

And as far as this business of improving openness of their markets, market by market, product by product, it seems that when you finish the negotiations, you go away for a period of time. You find that this thicket of impediments has grown back faster than we can cut them down.

We don't have enough trade negotiators to spend 2 or 3 years in each product line negotiating away the impediments of the trade and then find that almost overnight after we leave the conference table there is a whole new thicket of impediments.

And, again, I am not trying to be judgmental. Japanese are being Japanese and they're acting like Japanese. And we are being like Americans. Maybe their system is better. They seem to be doing extraordinarily well.

And I was really horrified by the statistics of Mr. Wolff in 12 emerging technologies, as the Chairman pointed out, that we are losing badly in 4, losing somewhat in 6, holding our own in 2 and gaining in none.

What does that auger for the future and what can we do about it? That is the main thing. Should we rely on changing the Japanese to be—from a country with very deeply-ingrained cultural and economic institutions, points of view—it is something quite different.

Is there hope in that approach? I wish I could think there is, but nothing that you learn from looking at the history of these negotiations and what happens after everybody leaves the conference table gives much help of relying on Japan to change, that that will make much difference.

It seems to me that we ought to do better on our own. We may never have much greater penetration of the Japanese market than we have, but at least we can compete with the Japanese and the Europeans outside of Japan.

Do we forget substantially about changing Japan and concentrating on doing a better job ourselves? Maybe I should ask you. You take the $40 billion trade deficit that we hope to achieve this year.

How much of that is due to closure of the Japanese system to our products? Great difficulty in access. And how much of it is due to the fact that the Japanese may design a better product, may manufacture a better product? May do a better job of inspection, may do a better job of packaging, may do a better job of promotion?

If you look at the automobile consumer magazines here, of the first five cars in terms of preference by consumers, the first four of them are Japanese. Only the fifth car is an American car.

So, maybe we should say the fault, Dear Caesar, lies not in the stars but in ourselves—not in the stars but in ourselves. Maybe we should say:

Physician, heal thyself.

Should we as a nation do more to improve the competence and the competitiveness and the productiveness of American society and spend a lot less effort in trying to convert the Japanese into a country which they hate and which, apparently, they don't have the slightest intention of becoming?

Now, that's a whole lot of questions mixed up in there, but I am really depressed from what you are telling to us, especially, I mean, Mr. Wolff's Commerce Department figures sum it all up. You are all reading from the same sheet of music, and I must say the testimony has been brilliant. The Japanese don't intend to change.

They are way ahead of us. There's no great likelihood that we can rely on their opening up their products.

What do we do in those circumstances? Do we assume that the Japanese psyche and the Japanese persona is a given and we work around it? Do we assume that a good part of that $40 billion is our responsibility? And do we go to work on trying to create a more competitive, productive economy here?

What should our goal be? Are there elements in the Japanese success that are appropriate for us to apply?

Are there clear lessons from the experience that there are significant areas in the United States where we can improve our performance?

What are the lessons for the future?

Lee and I are distinguished chairmen. We go through these public hearings for the purposes of learning and applying the lesson we learned here, applying those lessons into legislation, into different public policy-making.

What are the lessons that we should learn from you this morning that we should crank into public policy decision-making?

What would be different from the approach that we are taking now?

Mr. COOPER. I'm going to try to shed a little bit of positive light so you don't feel so negative about this situation. I think there are some changes taking place in Japan. Some of those have been alluded to by other speakers on the panel and I specifically am going to refer to the Structural Impediments Initiative and the process that took place.

It was interesting to note that during the process, a poll was conducted by a Japanese newspaper and it was on the Structural Impediments Initiative and the issues that the United States was trying to get resolved with Japan.

That poll showed that 80 percent of the Japanese citizens supported those goals that the United States was trying to achieve—the improvement in the distribution system, the pricing, the policies and others. I think that one of the things that has happened recently, in the last few years, especially with the appreciation of the yen, is that the Japanese consumer is becoming more aware of the differences between the lifestyle that they lead and the lifestyle that others lead.

Dr. Lincoln alluded to that in his testimony. That, because of the increase in wealth that they have achieved, because of the exchange rate change, they are traveling more, they are becoming more aware. Whether or not that attitude will filter through to the political system that changes will be made, I am afraid that I don't know.

But I think that it is an element to keep in mind.

Secondly, that the——

Representative SCHEUER. Let me say a word there. I hope that there will be an emerging Japanese consumer movement. I don't see a heck of a lot of evidence of it. The distribution giving local stores a...on large department is as inimical to the Japanese housewives' interest as it is to American producers who want to get into that market.

Japan protects their rice farmers to a degree that is hard for us to understand unless you look at the way that we protect our rice farmers. The Japanese housewife pays five times the world's price for rice. Not only is it hurting our price reductions, but with devastating effects on the rice production in Thailand, which is one of the great rice producers in the world—five times the world price for rice. And nothing seems to change that.

From the point of view of the Japanese consumer, they would be far better off permitting import of rice from Thailand, from the United States, from wherever.

The value of that land that is now protected would go way down and it would make it possible to develop homes, apartments—residential communities on that great area surrounding Tokyo where they are growing rice now.

And where the value of that land is incredibly high because they have a protected use. The Japanese, the people who work in Tokyo, travel an hour and a half or two hours a day to get to homes and apartments way removed from Tokyo. So, if they had a different land use policy, different policies on rice, it would greatly be to the benefit of the Japanese consumer and the individual Japanese citizens, workers, in the Tokyo area.

But there doesn't seem to be any evidence that is happening.

I'm sorry to interrupt you.

Mr. COOPER. That's quite all right. And I think, related to that, to the approach under which the SII was taken, I think it is interesting to note, important to note, that the issues that were selected were ones that were based on studies that the Japanese government itself is conducting and looking at the distribution system again and the—in some of the other land use policies, for example.

Now, again, you know, it may be a leap of faith to say that because the Japanese are studying this, that they are going to make changes. But, nevertheless, I think that it does indicate that they are looking at this, that there are pressures, impossible pressures, inside the Japanese society along with the pressures that are coming from without, not only from the United States but from other countries as well.

So, to maybe again shed some positive light on your observation, I think we can—that is something to take into consideration.

Regarding the lessons—you asked about what lessons that we might learn from our experience with Japan, and I think that one

of those is that we have to be very competitive. If American industries are going to compete, they no longer compete just within the borders of the United States. The market has become globalized.

And I think that the American firms are realizing that. They have been forced to realize that because of the pressures from import competition that took place particularly in the 1980s, again, when the dollar was especially strong. Imports came in very rapidly. I think, in some cases, industries are reacting to this, to this competition in making adjustments.

Second, I think a lesson can be learned in terms of trade policy strategies that we have to be persistent, as others have pointed out. And I believe, as Chairman Hamilton pointed out, too, we tend to reach agreements with Japan in various areas that we find that we have to revisit those areas later on.

And I think the lesson to be learned is that follow-up is necessary. It requires a lot of patience. But, in terms of the importance that Japan right now has for the United States, I think that it is a lesson that—or it is a lesson that is to be taken into consideration.

Representative SCHEUER. Can I hear from Mr. Lincoln and Mr. Wolff?

Mr. LINCOLN. Let me start by saying that we ought to treat the position of the United States in high-technology industries, the figures that have been alluded to, with a little bit of caution.

I agree, I, myself, worry about what I see in those figures. But, one of the things that we have done in the post-War world is to create a system that never existed before in which most of the nations in the world have agreed that it is all right if we import. It is all right if we are not preeminent in every field, that we have created an international trade system that has helped us to get over that sense of need to have resources and industries within our boundaries controlled by our people in order to survive and prosper.

This is a remarkable change for the world.

Representative SCHEUER. It is true, but when they systematically wipe us out, industry after industry after industry—we don't produce television sets, we don't produce VCRs. They are inexorably increasing their market penetration for automobiles, not by fiat, seemingly, because the American public likes Japanese cars, recognizes their quality, recognizes their excellent design. That isn't by failure of our trade negotiators. They are apparently able to put a car in the United States and compete with Chrysler, General Motors, Ford and what-not, and inexorably, year by year, increase their market penetration.

That is a consumer decision in this country.

Mr. LINCOLN. I agree. That is the second step in this. This system works fine so long as it is underwritten by two things.

One, a belief on the part of each nation that despite having these imports in certain markets that the resources of the nation are being used as productively as we can. If, in fact, we think we screwed up and that is why the Japanese have a big share in our automobile market, then we've got a problem and we should deal with that.

Also, it is underwritten by a sense of a rough reciprocity of access to other markets. It is all right if the Japanese sell us auto-

mobiles so long as we feel that we are getting roughly equivalent benefits in being able to export to Japan. And we have got problems on both of these things.

Representative SCHEUER. Mr. Lincoln, I see no evidence that the Japanese market is going to open up. And I am not trying to be judgmental. I am not criticizing Japan. I am simply saying that Japan is Japan is Japan. And our efforts to induce them to change some very basic cultural and business and government practices seem only marginally effective.

Should we concentrate on getting Japan to be more like us, or should we look at the elements in their success and educated work force, a long-term view of capital, not worrying about the return for this quarter or this year but looking 10 years down the pike?

And insistence on design excellence, on product excellence and quality on maintenance. Ability to save and invest in research and development and new plant and equipment. The rate of individual savings is four or five times ours, 15 percent of GNP over theirs compared to 4 percent here. What are the lessons we learn considering the experience?

Let me give you a proposition. It's not going to be very productive trying to get Japan to act more like the United States. Then we should get the United States to learn the lessons of Japanese, basic elements of Japanese competitiveness.

Why do American consumers prefer Japanese VCRs, Japanese automobiles, Japanese goods? And learn how to educate, train skilled productive work force, learn how management can take a larger point of view on capital, learn how to encourage the kind of savings the Japanese have developed.

Do we try and distill some of the reasons for their extraordinary success?

And, lastly, could we take as an approach:

Yes, we want to have access to the markets. We're not going to do it product by product. We want to bring a $40 billion adverse balance of trade down by $10 billion a year, or $5 billion a year until it is down to a reasonable proportion—no more than $10 billion thing. And you can do it any way you want.

You can give us greater access. You can buy more of our products over here. But we want to see that trade deficit go down inexorably by $5 billion, from 40 to 10. And you work out the details yourselves. You know more about how these thickets get developed than we do.

You know more about the kind of products that you want to import in the United States than we do.

Maybe, you will take our rice. Maybe, you will take more of our citrus fruits. But, you decide how we are going to work that deficit, that trade deficit down from 40 billion to 10 billion, because if you don't, we are going to have a very hard looksee at the openness of our markets as it applies to Japan.

Is that a possibility?

Mr. LINCOLN. There's a lot there. I agree with much of what you have said. Unfortunately, I don't think it is possible to take an either/or approach with Japan. It is not simply a matter of finding out how they succeeded or going after them trying to open up markets.

Certainly, there is much to admire, there is much to borrow from Japan. Among other things, and I think that you have named a number of very important issues, within the Japanese manufacturing sector there is a concept of continuous change and improvement within the factory that seems to go far beyond anything that we see in most American firms.

There has been a number of very key changes in the process of manufacturing, the way in which inventories are treated, the way in which quality control is handled, the way in which workers interact with one another on the assembly line.

Those are things that we all ought to be doing the most that we can to try to get those concepts embedded in our manufacturing process.

I think that we have had in excess of what the Japanese would call financial games in the United States—buying and selling corporations without the people who buy them really being concerned about the nitty-gritty of what happens in the factory.

Representative SCHEUER. Leveraged buyouts.

Mr. LINCOLN. Leveraged buyouts have not done us any good whatsoever. Now, that is something obviously that I think government policy could help to affect.

And then, finally, I might add that one of the reasons that we seem to lose market share in high-technology industries is that, relative to other countries—and Japan may not be the only one—we don't seem to have done a particularly good job in the process of transition from the laboratory into manufacturing. We do all right maybe at the very beginnings.

People at the university system go off and start firms and make millions of dollars. But, the next step of going from a fledgling industry to a more mature industry, we don't seem to manage that transition too well. We might want to take a look at that.

Representative SCHEUER. Do we need an industrial policy? Should our country really get behind the business of making us a real competitor with high-definition television, for example? With smart computers?

Mr. LINCOLN. Well, I guess I'm not in a position to make judgments at the moment on particular technologies, which is one of the problems with industrial policy.

But, if you mean industrial policy in the sense that the government of the United States ought to establish a coherent view of where the nation is going industrially and think about either particular technologies or particular policies that would apply to all technologies as a way of improving the performance, absolutely, I think we should.

I am not convinced that we want to have an industrial policy in the sense that Japan does, which I think is a rather heavy industrial policy. I don't think that would fit that nature of our society and political process very well.

But, we do need a more coherent view.

Let me just finish with one quick comment, which I hope that perhaps Alan Wolff will pick up and continue with, which is—this may not be enough all by itself—yes, the Japanese make good products. But, if, in fact, we just say forget about the Japanese. If they want a protected market, let them do it.

The problem in that is that, by having a protected market, you can use it to limit competition, raise prices, increase profits and use the excess profits obtained at home to lower prices abroad to gain market share and thereby end up with a destructive form of competition which would hurt us regardless of how well our industry does.

Mr. WOLFF. Mr. Scheuer, you have asked the right questions. Maybe, all of the right questions. It is a complicated problem. Were this a hearing, and you held them in the past and you will in the future, on what the United States should be doing, I think that your panel would have addressed a number of the things, including those that the Japanese do well that we should do as well.

And we have to worry about capital formation, cost of capital, a variety of other issues that give us a better competitive base. We have to worry about what our national labs are doing, whether they are relevant to our commercial successes, a whole variety of issues about what the United States should be doing to improve its competitiveness vis-a-vis Japan and everybody else.

With respect to the Japanese economy, I would submit there is no good alternative to maintaining the effort in the United States at opening Japan up because the alternatives are really what those who subscribe to I guess the managed trade school would prescribe.

And that is that we will just regulate the amount of trade. It would be a better solution only in terms of certainty but not a better solution in terms of consumer benefits, or even producer benefits in the United States.

We have inter-dependence with Japan in the manufacturing sector. We depend for better or worse, and I think it is probably for the better in some ways for a variety of industrial inputs. We don't want to revert to, in effect, a barter system.

You asked whether we could attribute a particular portion of the $40 billion imbalance to a closed market. I would say it is too late to unscramble that particular omelet We are out of televisions because of practices in the 1960s and 1970s. That causes us to be out of certain componentry today because we don't have a consumer electronics industry to sell certain semiconductors to.

Have we made progress? We have. It is far from adequate. I don't think any U.S. government negotiator would claim that anything that has been done is a cure-all in any sense to the overall problem.

I think the problem should not be minimized, however, but we have made progress. The semiconductor agreement we sell, that is, American firms as well as European, sell over a billion dollars more a year in semiconductors to Japan than we otherwise would have.

Now, what if Japan had never been closed? It would be a multiple of that.

Representative HAMILTON. That agreement comes up for renewal next year. Should it be renewed?

Mr. WOLFF. I should state for the record that I represent the semiconductor industry. It is the position of the industry and the consumers of semiconductors that a new agreement should be entered into with market access and anti-dumping provisions. All of the U.S. computer companies and semiconductors companies agree

that there should be a 5-year agreement to follow on from this agreement.

Representative HAMILTON. Is there opposition for that from some segments?

Mr. WOLFF. In academia perhaps there are a number of those who would have some criticism, but I think that is largely from misunderstanding of what was being attempted.

Representative HAMILTON. Let me pick up on a word that several of you have used, and I want to explore it a little bit, and that is the question of inter-dependence between the two economies. How closely are these two economies tied?

If we have a recession in the United States, is Japan going to have a recession? Vice-versa? What is this degree of inter-dependence between these economies?

And to elaborate on that just a moment, I have heard a very prominent economist whose name would be familiar to you, and I think that I perhaps ought not use his name, say that Japan makes a judgment about U.S. Presidential elections. And they work very, very hard to assure that the Japanese economy—not the Japanese—the American economy is functioning in a certain way in order to affect the impact of that Presidential Election.

And that they can have an influence, and that's the point, on the American economy and, therefore, on the American Presidential Election.

Now, that may be an exaggerated view. I have no idea. But, I do want to get some idea from you as to how close this inter-dependence is.

Mr. COOPER. Well, the inter-dependence is one that has been growing over the last two decades. As I mentioned in my statement in my paper, Japan is reliant on the U.S. markets to I think something in the neighborhood of for one-third of its exports that go to the United States. And this is especially important to particular industries, such as the auto industry, electronics industry, computer industries. In that regard, it is, you know, the dependence of Japan on the United States is very important.

Representative HAMILTON. Would you say that the Japanese have an enormous influence on the American economy?

Mr. COOPER. I think their influence is growing, but I am not sure I would use the word "enormous".

Representative HAMILTON. How about the rest of you?

Mr. LINCOLN. There is some influence. I don't think that they have an economic impact on the United States to the extent that they could have any reasonable influence on Presidential politics.

Representative HAMILTON. If the stock market plunges in Tokyo, is that going to plunge the New York Stock Exchange?

Mr. LINCOLN. No. In fact, we have just been through that exercise the last several months, in which Tokyo has gone down for very good reasons within Japan. And it had virtually no impact upon us.

Representative HAMILTON. Our market hasn't exactly been going up.

Mr. LINCOLN. It has not dropped in half like the Japanese have this year.

Representative HAMILTON. It is certainly a bear market.

Mr. LINCOLN. Yes, but, yet, I think the stock markets, in particular, may be a little less inter-connected. Interest rate and bond markets——

Representative HAMILTON. More so?

Mr. LINCOLN. More so. And, yes, the Japanese are important investors in the United States. But, if they stop investing, who is to say that somebody else doesn't start investing?

Representative HAMILTON. You look upon the Japanese investment in the United States as good or bad? Second best? How do you look upon that? Obviously, our constituents are concerned about that very word, about Japanese investment.

Why don't you allude to it in a highly visible way.

Mr. LINCOLN. Right. By and large, I think there is nothing wrong with Japanese investment in the United States. And we derive some benefits from it, especially when we are looking at manufacturing into the service sector as opposed to real estate.

If, in fact, the Japanese are better than us in certain kinds of manufacturing technologies, if they build factories here, those factories are going to incorporate those technologies, that makes us better off.

Representative HAMILTON. Are you worried about Japanese investment to the point where you think some legislative action is necessary here?

Mr. LINCOLN. I don't think we have reached that point yet. I can imagine it happening.

Representative HAMILTON. Are you, Mr. Wolff?

Mr. WOLFF. I think we ought to press forward with further investigations, like the Federal Trade Commission has undertaken with respect to automotive parts purchasing in order to make an informed judgment.

We have to welcome—we have to be open to investment and welcome it from all sources, including Japan. We just want that investment to behave in a market-oriented fashion and presumably most Japanese investment will.

Representative HAMILTON. We're going to have to finish up here fairly quickly because I understand votes are coming shortly. So I will jump around a little bit.

Friction between the two countries often refers to that as a result of the trade negotiations. Do you see that as kind of a continuing thing in the 1990s, that the trade negotiations are going to continue to create friction between the two countries?

After all, the bilateral relationship between ourselves and Japan has really been quite good. This is the area where we have had difficulty.

Is that going to get worse? About the same? How do you predict for the 1990s that the trade disputes will affect the relationship?

Mr. COOPER. I think, as I mentioned in my paper to the Joint Economic Committee, I think that the frictions will continue.

Representative HAMILTON. Are they going to get worse?

Mr. COOPER. I think they could, yes, sir.

Representative HAMILTON. Do you agree with that, Mr. Lincoln?

Mr. LINCOLN. They could get worse. I would be surprised if it got better.

Mr. WOLFF. Japan's industrial targeting has not stopped. It is still very much in evidence. That means that there will be export waves in the future and in future product areas, and in areas of market closure in Japan, which means we will have problems.

Representative HAMILTON. I was interested in your quotation of the Japanese, Mr. Wolff.

Kozo Yamumura about the SII talks, Strategic Impediment talk, everything is in the future there, isn't it?

So that means that we have to monitor those talks. Is there anything going on in our government to monitor?

Mr. WOLFF. They met this week in Boston at the sub-Cabinet level, the United States and Japanese sides. They plan two more meetings this year. SII I think is a useful contribution. I don't think that it is enough. It is not the answer to all of our problems.

Representative HAMILTON. Everything depends on the follow-up; correct?

Mr. WOLFF. Correct.

Representative HAMILTON. I think it was you, Mr. Lincoln, who said in your statement:

What has driven Japan is the desire to catch up.

Your phrase, I think. And Mr. Wolff talked about the vision thing, as we say here.

[Laughter.]

Searching for national purpose and all. Japan has pretty well caught up. What is it do you think that really drives this Japanese economic machine anyway? Is it still a feeling on their part that they are a second-rate economic power and they've got to catch up? What drives them now? Most of us would say they have already caught up.

Mr. LINCOLN. Right. Even most Japanese would agree with that now. That is one of the changes of the 1980s. This is a problem for them. They're not sure what drives them now. At least, the discussion in Japan of what ought to drive Japan suggests that no one has any clear idea.

In the absence though of the intellectuals and the policymakers to come up with a new definition of what Japan's purpose is, what we have is a continuation of the past.

And so the policies that flowed out of trying to catch up are still there.

Representative HAMILTON. Mr. Wolff talks about enlightened and selfless goals in the conclusion of his statement.

What do you mean by that, Mr. Wolff?

Mr. WOLFF. I think the burden-sharing in a broad sense that Japan has to welcome the goods of other countries, first and foremost; investment as well. That will be part of it.

But, not just the United States. In Japan, not just the U.S. Codes. I mean, the goods of Taiwan and Korea and Indonesia, Thailand and the other countries.

Representative HAMILTON. Do you think it is a mistake to push Japan to make a contribution in the Persian Gulf, a military contribution?

Mr. WOLFF. I think it is just—we distort our policies sometimes driven by short-term needs. I think that is not where we should want Japan to make its major contribution to the world economy.

Representative HAMILTON. You would certainly think they ought to make a large national contribution?

Mr. WOLFF. Yes.

Representative HAMILTON. You were talking there about a military contribution.

Mr. WOLFF. Military contribution, right.

Representative SCHEUER. How about in the field of foreign aid? We spent 6.5 percent of GNP on our military. Japan spends about 1 percent. Suppose we were to establish the proposition that we would like Japan to take most of that difference of like 5 percent and apply that to vastly increased foreign aid programs?

Now, I will say, I will give Japan full recognition. She is the number one foreign aid donor as it is. She has vastly improved her performance. But, if she were to spend most of the difference between 1 percent and 5.6 percent of her GNP, there would be 50–100 billion dollars pumped into that flow of foreign aid annually. She could bring concepts of family planning and rational population policies to Sub-Saharan Africa. There was an article in last May's issue of Scientific America about population growth rates in Sub-Saharan Africa.

It indicated that, if they don't have massive change, their present population of about 550–600 million is going to go to two and a half billion later in this century.

Now, our Administration apparently has hang-ups about promoting abroad a really effective family planning program. We didn't up until the last 10 years, but we seem to now.

Supposing we asked Japan to fill that gap and to treat Sub-Saharan Africa as a real challenge to bring rational family planning programs to the young couples and young kids in school?

Suppose we asked the Japanese to help promote a program of reforestation, to replant the vast arid areas of Sub-Saharan Africa?

They could do an enormous amount of good for all mankind if they were to concentrate on these two areas. Is that a justifiable request for them to make? Does it make sense?

Mr. WOLFF. In 1987, Japan exported $1.6 billion in transportation and telecommunications products to China, Thailand, Malaysia, the Philippines and Indonesia and $1.4 billion of that was in aid sent to those countries.

It would take a reordering of priorities, which I think there should be. I agree with you.

Representative SCHEUER. Up until now, Japan's program, foreign aid program, has consisted of going to a country and saying: Here are the total provision of goods and services that our country can make available to you. Why don't you pick out the package. It has really been—and we will give you some subsidized pricing and long-term credits and all that. But it really has been a way of merchandising the excellent body of goods and services that Japan is capable of contributing.

I am talking about something else. I am talking about Japan's looking at the needs of the recipient countries and saying: You have a need for a massive program of family planning. Most of that is not in products. It may be in condoms. It may be in a few other specific services.

But, most of it is in education. Most of it is in infrastructure. Most of it is in job learning. The same thing in reforestation.

Most of the aid that Japan would give if there was a massive reforestation program would be in buying trees locally and educating local indigenous populations how to accept a principle of sustainable development when they got a new forest or a new Savannah or new grass or new shrubs development. And showing them how to use it.

A lot of local education and training. Some purchases. And locally of trees, savannas, grass, shrubs that made sense in that climate.

It wouldn't be much of an importation of Japanese goods. It would be a tremendous importation of Japanese talent, Japanese leadership, Japanese organizing ability.

Would it be reasonable for us to say to Japan:

Look, military burden sharing has real complications. We have a problem in our country opening up your country to our products. One way that we could involve you in the world economy is for you to take a massively-increased role in certain kinds of foreign aid so really uniquely suitable to you, and put 50 or a hundred million dollars into a global reforestation program, especially in Sub-Saharan Africa. Put $50 billion into family planning programs in Sub-Saharan Africa to avoid scenes on our television sets 50 or 100 years from now that will beggar the horror and tragedy and pathos that we have already seen—a kid starving. They are held in the arms of a foreign aid worker.

Is that a reasonable challenge to give the Japanese?

Mr. WOLFF. I would subscribe to that fully.

Mr. LINCOLN. I would agree with that thoroughly. And it doesn't have to take 5 percent of Japan's GNP. They could be doing much of those things with their foreign aid program today.

I also want to endorse, by the way, the idea that we do not want Japanese military presence in the Middle East. I think that is bad for Japan. I think it is bad for the United States. Even in the Middle East though, the Japanese could have, if they had the kinds of people available, a human presence involved in helping the refugees in Jordan and doing a variety of other things that would have been good for Japan. It would have been good for the problems that we have in the region, without having to drag up the question of the role of the Japanese military.

Representative HAMILTON. May I ask you, as we come to a conclusion here, what is it in the Japanese make-up that makes them resist open markets? Why do they not open up their economy? Why is it so hard to get them to do it?

Mr. WOLFF. I would suggest that it comes from group behavior to some degree. One of the things that the Structural Impediments Initiative is addressing not terribly successfully is the role of keiretsu, the role of inter-company dealings, that as part of it an obligation to the group, which means buying from each other rather than buying from even the more competitive, better goods from abroad, which I don't think it extends to the Japanese consumer, but it is certainly a problem within Japanese business.

And I think there was a sense of vulnerability, of isolation, certainly after the Second World War, but before it as well, of needing

to rely on each other in order to grow and expand and, therefore, putting the producer first rather than putting the consumer first.

Representative HAMILTON. For the Japanese politician, is there enormous pressure from the business community to protect their markets and to resist access?

Mr. WOLFF. In quite a number of areas where we have had the greatest degree of problems, there is a very close political relationship. It is a fund-raising relationship in some areas. That is another source of the problem.

Representative SCHEUER. Could I make a footnote, Mr. Chairman, to what Mr. Wolff is saying? The Japanese consumers very much like buying competitively.

To watch a plane load of Japanese tourists getting on the aircraft in Honolulu, holding bags and packages and VCRs and clothes, and state is an experience. The Japanese purchases of American products in Honolulu before they get back on that plane is billions and billions of dollars a year.

I know of one exporter who doesn't have access to the Japanese market who sells several billion dollars a year. One corporation, to Japanese tourists going back to Japan. They love the idea of the shopping center, of the discount store, of being able to buy an attractive array of goods, many of which are available in Japan but they can buy them far cheaper in Honolulu, including goods manufactured in Japan that are available cheaper in Honolulu than they are in Japan.

Representative HAMILTON. To conclude, let me ask you to identify for us what you think it is about the Japanese system that has made it so successful. Why has that economy worked so well?

Mr. LINCOLN. I think it is impossible to sum that up in one sentence, but I think it is a combination of being a group-oriented society, because corporations are, in fact, groups; a focus on education; a focus on economics. They were not distracted from that goal in the post-War period. We can go on and on with a variety of other things.

Mr. COOPER. I would concur with Dr. Lincoln and I would add, too, the Japanese have shown a real desire to work hard. I think that they have set goals for themselves that have proved successful. But I would also add, as a whole, the Japanese economy has a long way to go. There are gaps in the economy, as all three of us alluded to this morning that——

Representative HAMILTON. What are the most serious weaknesses in the Japanese economy?

Mr. COOPER. I think the fact that housing is still very expensive in Japan, the basic standard of living for the Japanese.

Representative HAMILTON. Consumers get the short end of things?

Mr. COOPER. Exactly. Prices are still very high in Japan. As a whole, Japan has become wealthier, but the average Japanese still hasn't realized that wealth.

Representative HAMILTON. Mr. Wolff, on the question of why it has been successful?

Mr. WOLFF. Governments I think tend to succeed at what they set as objectives. We have put men on the Moon. We have put men and women into Space. We have defended democracy and spread it

throughout the world. We have seem communism collapse due to, in part, our efforts. We have set different goals and the Japanese have set a goal of industrial advancement of their economy. And they have succeeded.

It has been, as has been noted by the others on the panel, at the expense of the standard of living of the average Japanese.

Representative HAMILTON. Is an additional reason for the success of the economy the fact that the relationship between the government and the private producing sector has been a very cooperative and productive relationship?

Mr. WOLFF. I think, without question, we have an adversarial system of government. And we have an adversarial relationship between government and industry in most areas. And it is carried to an extreme and it is destructive.

Representative SCHEUER. Mr. Chairman, very, very briefly, and I appreciate your tolerance, it must be said in all fairness to Japan that they have got some things going for them that we don't. They have a far better educated and skilled, trained force, trained work force, than we have.

Their systems for educating their noncollege-bound youth that play important roles in the factory in the plant—they are far better than ours.

Their ability to aggregate capital beggars us. They save at four times the rate that we save. They produce more mathematicians, scientists and engineers for a country less than half our size than we do.

They know how to take a long-term view of profits and not just performance by the quarter or by this year, but over a 10-year period.

There is a lot that justifies their efforts and their market penetration here that has nothing to do with impediments to access to their market.

And we would do very well to look at the lessons that we could learn along the lines that I have just suggested.

Representative HAMILTON. OK. Thank you, Mr. Scheuer.

Thank you very much, gentlemen. We have had a good morning and we appreciate your contributions.

And, the Committee stands adjourned.

Whereupon, at 12:04 p.m., the Committee was adjourned.]

JAPAN'S ECONOMIC CHALLENGE

TUESDAY, DECEMBER 4, 1990

U.S. CONGRESS,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Committee met at 10 a.m., pursuant to notice, in room 2359, Rayburn House Office Building, the Hon. Lee H. Hamilton (Chairman of the Committee), presiding.

Present: Representatives Hamilton and Scheuer.

Also Present: Richard Kaufman, Dorothy Robyn, and Carl Delfeld.

OPENING STATEMENT OF REPRESENTATIVE HAMILTON, CHAIRMAN

Representative HAMILTON. The Joint Economic Committee will come to order.

This morning, we resume the series of hearings on the Japanese Economic Challenge which we began in October. About a year ago, I asked the staff of the Joint Economic Committee to do a study of Japan's economy. And, subsequently the Congressional Research Center of the Library of Congress agreed to help coordinate the study.

These hearings are based, to some large extent, on the study which the Committee has released today. It is entitled "Japan's Economic Challenge," and it contains 35 papers contributed by government and private specialists on Japan's economy.

The topics include fiscal and monetary policy, finance and investment, the roles of government, business and labor, their interrelationships, social security, science and technology, the environment, defense sector, foreign aid and a number of other topics.

In the earlier sessions, we discussed the roles of government, business and labor including industrial targeting, the keiretsu and education and training of the labor force as well as international trade issues. Today, we will examine selected areas of the manufacturing sector.

There seems to be a consensus that one of the strongest aspects of Japan's economic challenge emanates from the proficiency of Japanese manufacturing firms. In industries such as automobiles and semiconductors, among others, Japan is out-pacing the U.S. and in some instances has established leadership, if not dominance.

Our interest is in understanding the trends, the factors behind the trends, and how the U.S. should appropriately respond. To help answer our questions, we have with us today a knowledgeable panel of specialists, two of whom contributed papers to the JEC

study, all of whom are well qualified to address the key issues and put them in perspective for us.

Andrew A. Procassini is president of the Semiconductor Industry Association, a trade association which represents U.S. based manufacturers of semiconductors. He has a Master's degree in economics and a Doctorate in business administration and served in senior management positions with semiconductor firms in the U.S. and Japan.

Michael J. Smitka is an Assistant Professor of Economics at Washington and Lee University. He has written and lectured extensively on Japanese manufacturing and technology. The Columbia University Press will publish his book on Japan's automobile industry next year.

Dorothy B. Christelow retired in 1986 from the Federal Reserve Bank of New York where she served as an international economist in the Research Department. She has published many articles on monetary and financial systems, international trade, international direct investment, and is currently writing a book on United States-Japan direct investment relations.

You are all, of course, welcome before the Joint Economic Committee. And, we appreciate very much your willingness to be responsive to our request.

The procedure format here will be for each of you to take about 10 minutes to summarize your views. The written statements, of course, will be entered without objection into the record in full. And, after the presentations then we will turn to a question and answer session.

I have been advised perhaps that the best order here would be to have Dr. Smitka go first, to be followed by Dr. Procassini and Dr. Christelow. If you have no objection to that, we will proceed that way.

Dr. Smitka.

STATEMENT OF MICHAEL J. SMITKA, ASSISTANT PROFESSOR OF ECONOMICS, WASHINGTON AND LEE UNIVERSITY

Mr. SMITKA. Thank you, Mr. Chairman. I would like to make two points today, and I will conclude with three policy proposals for a bottom line.

First, some good news, that is that I believe in the 1990's, North America will become the low-cost production base for the automotive industry. The bad news is essentially the——

Representative HAMILTON. Low-cost production of what?

Mr. SMITKA. Low-cost production base in the world industry.

Representative HAMILTON. OK.

Mr. SMITKA. This is also bad news in a sense. During the 1980's, we have been rapidly becoming more competitive but this has been at substantial cost in terms of plant closings and other sorts of dislocations. I foresee this continuing into the 1990's.

Well, the good news is that the U.S. industry—and this now includes 10 new entrants, 9 from Asia and GM Saturn—is far more efficient than it was 20 years ago or even 10 years ago. Since the auto industry is the single largest manufacturing industry in the U.S., this is, of course, important.

It's also important from a trade perspective. We currently run about a $30 billion trade deficit in autos and in automotive parts with Japan alone and an additional deficit with Europe. To the extent that we can become more competitive, our imports should decline and this should be good news in terms of total employment within the U.S.

The bad news though is that many producers in the U.S. are still not efficient or are ill positioned for the trends that are emerging in the last decade and in the 1990's. Hence, I think rather than seeing existing firms uniformly becoming more efficient, we will see many firms having to close plants or exit the industry altogether.

Now, let me turn to Japan and argue why this is true. Why do we have foreign producers now holding a third of our passenger car market and of new entrants 21 percent of passenger car production in 1990?

I think there are some transitory reasons and some continuing reasons. On the transitory side, in 1970 wages in Japan were still relatively low. Japan was specialized in the small car segment in its domestic market. The yen was fairly weak which made it easy to export. And at the same time, going into the 1970's, Detroit was handicapped in particular by a series of regulatory changes and also by some wage benefits that were negotiated in the 1960s that turned to have unforeseen impact in the 1970's and 1980's.

All of these things have now turned to our advantage. In the last 5 years alone, wages in Japan have risen about 20 percent. At the same time the value of the yen has approximately doubled. This means that from a labor cost perspective, we are now cheaper than the Japanese. Japanese labor is running about $23 an hour in the automotive industry on average, and the differential between parts and assemblers is not as great as in the U.S.

The other transitory factor is that in the U.S. market, small is no longer beautiful. The Japanese were able to make rapid inroads after the first oil crisis when oil prices quadrupled, in part because the domestic firms had no cars in that segment. So the market was left to the Japanese and they were very quickly able to import or penetrate in that segment and eventually moved upscale. Well, Americans have now shifted towards buying larger cars and I think also have realized that fuel efficiency is not everything. So even if we do see oil prices continue to increase, I don't think that will have as big of an impact as it did in the 1970's.

There are also a set of continuing elements. These principally come from stronger management on the Japanese side. The Big Three have gone for roughly 50 years dominating the domestic industry. And I think even within the U.S. they weren't known as exemplars of good management, particularly in the production end. They had many quality and other problems.

On the other hand, in Japan you had nine car producers that survived the years of ferment in the 1950's, and so the Japanese firms couldn't take and ignore costs or quality if they were to survive against their competitors. At the same time, the economic environment in Japan was quite different and this induced a number of management responses to problems that firms in the U.S. didn't

face, although we found in the last decade these techniques can be used in the U.S. just as well as in Japan.

If we look at the assembly end of the industry then, we can see that the Japanese had a big productivity advantage and a big quality advantage in cars. There is a lot of data on this that has been developed by the International Motor Vehicle Program at MIT.

Here, we—that is the Big Three—have rapidly improved our own performance. They have been able to improve their quality. They have been able to look at things such as just-in-time scheduling for production control, statistical process control to try to improve quality and so on, and have been improving rapidly. And, by the way, the European auto producers have essentially not done any of this yet.

The second thing is that price is also less critical in the mid-car segment. Margins are much fatter and a small cost disadvantage can be lived with, whereas it's much more difficult to do that in the small car segment.

On the other hand, design is very critical. And, here the Japanese also have an advantage. They can design a car in roughly half the time of the Big Three or roughly 2½ to 3 years versus 5 or more years for the Big Three, 6 years or more in the case of European producers. They also do this at half the cost. That means, of course, if they have a product that flops—and inevitably there will be a car that will fail in the market—the Japanese firms can recover very quickly. Similarly, if there is a fundamental change in the market, they will be able to adapt their output mix much more rapidly than the Big Three.

The source of this strength comes from an ability to coordinate across functional specialty. There are a lot of sources for this. But, in Japan, stylists talk with designers, talk with production engineers, talk with manufacturing and are able to integrate their activities much better using a number of management tools such as value analysis. This allows them to engage in simultaneous engineering.

Now, this is important since there is an engineering adage, the 80/20 rule, that 80 percent of cost comes from the first 20 percent of the design process. So, if you can get the early part of your design process interacting with the later stages, you have a big advantage. Detroit, on the other hand, has tended to proceed sequentially. Once one step is done, then the next step commences and there is very little overlap.

Well, another source of strength comes from parts manufacturing. Assembly, after all, accounts for about 15 percent of costs, though of course the auto firms undertake other activities as well.

And, here again, the Japanese and the United States industries differ very significantly in their practices. The historic U.S. strategy—and this is again beginning to change, but the historic strategy was to integrate vertically, to try to make subassemblies in-house as much as possible and to purchase simple parts from outside the firm. So the Big Three would have 10,000 or more parts suppliers from whom they would purchase simple parts. And in order to be able to do this in an effective manner, the Big Three also carried out virtually all the design activities in-house. That way, they

would simply send out specs to a number of potential suppliers, find out who bid lowest, and that company would get the deal.

But that meant that American automotive parts firms in general focused on manufacturing simple parts and maintained very little or no in-house engineering or design capability. The Japanese strategy, on the other hand, was to out source as much as possible, to take and purchase rather than to make in-house. And, this shows up particularly in small subassemblies which the Japanese firms try fairly uniformly to purchase from outside. Then, it becomes much more important to coordinate with the parts producers. Now the Japanese firms tend to deal with 200 to 300 direct suppliers rather than 10,000. They can then coordinate the design, size and other aspects. And, this has worked fairly well, in part because there are many specific management techniques that they have developed.

The bottom line here though is that the parts firms have been an important contributor to reduce costs in the industry. If we look at the late 1950's and mid-60's when the Japanese industry was going through its biggest changes, the price of a car was roughly halved. The parts firms and material suppliers were responsible for two-thirds of that cost reduction. The internal efforts of the auto firms themselves for only about one-third.

Similarly, in the design end, parts firms in Japan account for about half of all engineering hours in producing a new car. Quite literally, a Japanese auto firm cannot design and bring to market a new car without input from suppliers. They don't have sufficient in-house engineering to do that now.

Well, let's return to the U.S. We had transplants come to the U.S. initially because of the voluntary export restraints but they are now discovering that production in the U.S. is sensible from a cost standpoint. When they arrived here, as the yen became stronger and plus political pressure, they wanted to purchase more parts here. They found the traditional suppliers in the industry ill suited for their needs. And, hence, we've seen also about 200 auto parts firms enter the industry from Japan, and about another 100 from Europe. I think that Dorothy Christelow will be touching on those issues in more detail.

This has brought about a lot of change in the industry. The Big Three have begun to change very rapidly. The parts sector is just beginning to change in the case of most firms. Of course, selling to the new entrants is very important for the parts side of the industry, because the transplant assemblers are accounting for more and more of sales.

Let me turn to a couple of possible policy directions and try to finish up as rapidly as I can. I think, above all, we simply need patience. I don't think ultimately there is a whole lot we can do to speed the process of transformation. I don't believe it can be stopped. I don't believe it's sensible to try to impede that.

Nevertheless, I think there are three issues that we need to pay attention to. One, I will label education. First, I think a lot of firms in the industry still aren't aware of the new competitive environment they face. They need still to be convinced that they have to change if they are to remain in the industry. Perhaps if we look at the case of Chrysler, we can see that this is not as automatic a

thing as we might think. Chrysler faced near bankruptcy a decade ago. Yet, only in the last 2 years have they begun to reform their internal management, and in so doing they have rapidly been able to shave off over a billion dollars in costs.

In terms of education for suppliers, they have needs that the large firms don't. It's much harder for them to sort through best practice to discern what's good, to locate appropriate consultants and so on. So, I think at the Federal and the State level there is much that can be done. A January 1990 report of the Office of Technology Assessment, Making Things Better, includes a number of detailed proposals there.

The second thing that can be done is to maintain pressure upon the transplant firms. They should be encouraged to purchase from existing firms in the U.S. whenever possible. That will minimize some of the trauma. They should also be encouraged to move design functions to the U.S. as rapidly as possible. That will make it far easier for domestic firms to work with them in the co-engineering that is so critical for the needs of the Japanese firms. It's very difficult to carry out engineering across the Pacific Ocean, although there are a number of American firms that are doing so. It's much harder for small firms to do that.

Again, the Japanese firms could be encouraged to set up consulting networks to help train suppliers or a would-be supplier. This is something that they were actively engaged in during the formative years of their own industry, particularly in the 1960's. They all set up supplier cooperative associations. They set up engineering centers for their suppliers. In terms of pressure, setting up something like a cooperative association would make visible who the direct suppliers are to the transplants. This is important, because the direct suppliers are making subassemblies and so often they want to buy simple parts. That's a market that existing firms in the industry know how to sell to. So, a supplier association could serve as a conduit for that.

Finally, I think we need to pay attention to what is happening in Europe. By 1992, the European market will be substantially the largest in the world, not the North American market. It will be at least 25 percent bigger than our market. And, if eastern Europe pulls itself out of its current crisis, the market is potentially much bigger.

We need to be very careful that American firms are not excluded from that market because of the identity of their shareholders. If something is made with American labor, then I think we, as a government, have an interest in seeing that we have market access.

Ford and GM have strong positions in Europe, but Chrysler does not and many of the transplants do not. I think North America is a very attractive base for exporting to Europe. And that will be true as well for many other industries, not just autos.

I thank you very much.

[The prepared statement of Michael J. Smitka follows:]

PREPARED STATEMENT OF MICHAEL J. SMITKA

OPENING CLAIMS

I would like to make two claims for the future of the U.S. auto industry. My first point is that North America is likely to be the low cost production base for the worldwide in the early 1990's. My second point is that this is not entirely good news, because becoming low cost producers has been, and will continue to be, traumatic to many in the industry.

REITERATION

The 1980's were more turbulent for the U.S. auto industry than perhaps any since the 1920's. The 1990's are likely to see continued upheaval. But in contrast to the decline witnessed in the first half of the 1980's, in the first half of the 1990's we will see the automotive industry in the U.S. and Canada become more competitive than that of Japan or Europe. This will offer great potential, for employment, as imports fall; we may even see significant exports to the European Community, which is 25 percent larger in size than the combined U.S. and Canadian markets. In the U.S. we now have more auto firms competing more vigorously than at any time in the last 50 years. In response, the Big Three have drastically improved their own operations, and are turning out better cars at lower cost. We as consumers benefit from this, and we as workers will benefit from higher productivity. We will thus see an improvement in both employment and automotive trade, as total domestic production of vehicles and parts continues to increase.

The bad news is that change has been and will continue to be painful. In the 1980's we have seen the Big Three cede over ⅓ of the passenger car market to foreign producers, and Chrysler fall into 4th place in the passenger car market. But we have also seen significant new entry into vehicle production for the first time in over 50 years: alongside the Big Three we now find 9 "transplant" assemblers. Similar changes are now underway in the automotive parts industry. For the workers involved in the less successful producers, the advent of competition is not good news.

WHERE DID JAPAN COME FROM?—TRANSITORY SOURCES OF ADVANTAGE

The Japanese success in the auto industry has two sources, one transitory and the other more enduring. On the one hand, the Japanese were uniquely positioned to take advantage of changes in the American car market in the period following the first oil crisis. This window of opportunity, however, has now closed, and firms operating in North America are now better posed to produce quality vehicles at low cost. First, with the quadrupling of oil prices in 1973 American tastes shifted from large to small cars, a segment where the Big Three had been perennially weak. They were thus the only ones in the market. Second, at the start of the 1970's Japanese wages were still relatively low, and rose slowly in the late 1970's while auto industry wages in the U.S. escalated rapidly under the impact of cost-of-living adjustments and benefit packages negotiated in the 1960's. Finally, during 1981-85 the dollar was extremely strong, making it easy to export to the U.S. These advantages, however, have shifted in our favor. The American consumer again is buying larger cars, so that producers here are back on familiar ground. The yen is now strong and the dollar weak, a situation I believe to be permanent. Finally, in dollar terms Japanese wages are now higher; Japanese labor costs in auto and auto parts industry now average about $23 an hour, more than the average level in U.S. manufacturing, though still below the $30 per hour cost of UAW labor. Much of the cost gap has thus been closed. Japanese exports to the U.S. are declining, both in volume and in dollar terms. And for the first time Japanese firms have had to resort to rebates and incentives; two firms, Nissan and Subaru, have suffered sales declines.

Japanese producers probably maintain some cost advantage. This is less significant now that the market is no longer centered on low-priced subcompacts: margins are fatter in the middle and upper market, and it is not price alone but styling and marketing that carry the day. Unfortunately for the Big Three, the Japanese produce cars with fewer defects. More important, Japanese firms can design a new car in virtually half the time—2½-3 years versus 5 or more years—and at half the cost. Should consumer tastes again shift, it is Japanese firms that will be able to respond first. And for new cars that flop, Japanese firms will have invested far less money and recover more quickly than the Big Three. (European firms lag even further behind in this area.) And it is sobering to note that, despite the virtual doubling of the yen in strength since 1985, Japanese firms have been able to improve their productivity sufficiently to not be shut out of the market.

ENDURING SOURCES OF ADVANTAGE: SUPERIOR MANAGEMENT

The second source of the Japanese success, therefore, is superior management, both in production and design and engineering. That is an advantage which has not proved transitory. Most of you are now familiar, I am sure, with just-in-time scheduling, statistical quality control and the use of small production teams and QC circles, all techniques which existed in one form or another in the U.S. These have helped Japanese firms to run their factories more efficiently while turning out high quality products. Nor are these techniques only applicable in a Japanese environment: the transplant operations are on average doing quite well, accounting for 21 percent of U.S. car output. In large part due to their example, the Big Three have made considerable strides in improving their own operations, though they still lag behind Japanese best practice.

Less well known is the superiority of Japanese in the design process, as illustrated by short development cycles. But the Japanese success, however, not only in the auto industry but in consumer electronics and other assembled products suggests that there is some common element at work. In short, Japanese firms have learned to better integrate across functional lines than in the U.S. On the one hand, the Japanese make heavy use of value engineering and other management tools that help coordinate the efforts of individuals with different functional skills. In addition, authority is often vested on a project or team rather than solely a functional basis. Coupled with this, personnel are rotated across functions, even if in the long run they come to be identified as designers or product engineers or marketers. (Of course, promotions can then no longer be made solely on the basis of professional competence in a given specialty: in the long run, personnel departments and not the heads of functional departments must decide upon promotions.) All of this serves to make "simultaneous engineering" possible, which speeds the development process while lowering costs. And it also increases feedback at the early stage of product development. This is critical because, as an engineering adage has it, 80 percent of costs are fixed in the first 20 percent of the design process.

We must be careful, however, not to place undue emphasis on the automotive assemblers, because in Japan over 70 percent of costs stem from the purchase of parts and materials. The cost and quality of the final car is thus hinges as much upon suppliers as it does the auto firms themselves. Here the strategies adopted by the Japanese auto firms, and the structure of the parts industry that resulted, are vastly different from those found in the U.S. For reasons I detail in my forthcoming book, during the 1950's the Japanese auto firms shifted from a strategy of vertical integration to purchasing as much as possible from outside suppliers; in contrast, from the 1920's Ford and GM adopted a strategy of vertical integration. Over time, the Japanese auto firms not only came to purchase more parts, but they also began to purchase parts differently. Unlike the Big Three, who purchase primarily simple parts and "off-the-shelf" items, the Japanese auto firms came to purchase components and subassemblies, lessening the size and complexity of their internal manufacturing operations.

But such tasks are also far more difficult, and require greater coordination. Over time, therefore, the Japanese auto firms each came to deal with only 200–300 outside suppliers, in contrast to 10,000 or more that was typical of the Big Three. To improvement the technology and management of their suppliers, which at the time were often very small firms, the Japanese auto firms established supplier cooperation associations. These served as a conduit for teaching suppliers about advances in rapid die changes and other developments in metalworking technology. It also provided a mechanism through which quality control techniques—and accounting and other basic management tools—were taught to suppliers. Equally important, the close interactions between suppliers and their automotive customers created an environment in which the auto firms were able to extend value engineering and other internal management techniques across not only their internal departmental walls, but across corporate boundaries as well. Suppliers thus became an important, if not the major, source of innovations that result in better designs and lower cost production. In fact, during 1958–65, when the price of a car fell by ½, the auto firms proper accounted for only a third of the improvement in costs. And today, outside suppliers now undertake about half of the design and engineering work involved in launching a new car.

THE NORTH AMERICAN INDUSTRY AGAIN

Let me now return to North America and the 1990's. Production at Honda's Maryville plant, the first of the Japanese transplant operations, commenced in 1982; new plants continue to be opened. Undoubtedly part of the reason the Japanese

opened these plants was to circumvent the Voluntary Export Restraint imposed upon them in 1981. But to the surprise of the Big Three (and probably to some of the Japanese as well), the transplants were able to quickly achieve quality and productivity levels that virtually match those of the parent firms in Japan. (Some, being newer, were even able to utilize new production methods ahead of the parent firm.) As noted above, the Big Three have responded, but so far primarily at the level of factory production rather than management systems.

Competition has now spilled over to the parts sector. The high dollar cost of production in Japan (and pressure by the U.S.) has led the transplants to seek to purchase more parts in the U.S. And, of course, as the market share held by Japanese firms rose—and that of their traditional customers fell—parts firms themselves also had a strong incentive to seek business with the Japanese transplants, and with customers overseas. Unfortunately, the traditional purchasing strategy followed by the Big Three meant that existing suppliers in the U.S. and Canada were often small firms that made single parts, and had no experience making subassemblies. Again, because the Big Three kept engineering in-house, the supplier base in the U.S. was weak in design and engineering capabilities. Traditional North American suppliers were thus on the whole ill-positioned for selling to the Japanese, who above all valued engineering capability and general management skills, and wanted suppliers who could run subassembly operations. (Since design operations were located in Japan, even capable firms often balked at selling to Japan.) Thus the Japanese assemblers felt forced to urge their suppliers in Japan to set up manufacturing operations in the U.S. To date approximately 200 Japanese firms have set up their own "transplant" manufacturing operations, either directly or via joint ventures; numerous European firms have also set up shop here.

Significant challenges thus remain. While assembly productivity in the industry has improved greatly, both due to the entry of the transplants into production here and to the efforts of the Big Three, the design and engineering skills of the domestic industry still lag. The Big Three (and even more European makers) remain inferior in their ability to respond quickly to changes in market conditions. Parts producers have also lagged behind. Imports are falling and domestic production is increasing, but existing suppliers are ill positioned for selling to the Japanese transplants, while the Big Three have begun to make such greater demands of their suppliers. There is thus likely to be continued displacement, as new firms enter the industry and the better-positioned firms—including transplant parts producers—increase their market share. Finally, over the longer run, new production methods will demand higher skill levels from our work force. The decline or outright collapse of schooling in the U.S. will place an increasing burden upon manufacturers during the coming decade, and particularly in the next century.

POLICY RESPONSES

How can we respond? There are, unfortunately, no quick fixes; for the most part we will simply have to be patient, and resist the temptation to implement ad hoc measures that will impose short-term costs but have little long-run impact. Nevertheless, several things can be done. Perhaps the most import role that Congress and the Administration can play is an educational one. We need to stress that the competitive environment in the auto industry has permanently changed, and that firms must begin responding now if they wish to remain in the business. We should not be naive that the Japanese success will automatically bring this about: despite Chrysler's near-bankruptcy a decade ago, only in the past 2 years has it begun to seriously reorganize its internal management structures, succeeding quite quickly in eliminating over $1 billion in costs. Large firms have the ability to seek outside advice and talent, but smaller firms find it much harder to separate the good from the bad. There is much that can be done, at the Federal and State level, to provide all firms in the industry with access to better management and production techniques. A recent report of the Office of Technology Assessment, *Making Things Better,* offers a sample of possible approaches.

Second, we need to maintain pressure on the Japanese auto manufacturers to transfer more of their design and engineering operations to the U.S., and to go out of their way to utilize existing suppliers. The "transplants" quite naturally relied at first upon parts shipped from Japan; over time they have been shifting to local procurement because local production is competitive. However, Japanese firms engage in extensive co-engineering with their suppliers, while most engineering activities are still carried out in Japan. They have thus found it easier to encourage their suppliers to move here from Japan than to get existing firms to set up engineering operations in Japan. Moving engineering functions here will make it easier for firms to sell to the transplants. The transplants should also be encouraged to staff

"consulting" centers in the U.S. whose job would be to help American suppliers come up to speed—something they did for their suppliers in Japan during the 1960's. Furthermore, they should organize supplier associations similar to those long present in Japan, in part to help local suppliers improve their operations, but also to serve as a clearinghouse for the efforts of American firms to enter into joint ventures with Japanese parts makers and to become subcontractors to the "transplant" parts makers: they, and not the transplants, tend to purchase the simple parts which traditional suppliers are used to making.

Finally, we need to be careful not to forget the potential for exports to Europe, a market which in 1992 will be 25 percent larger than our own, even without including the Eastern European market. Studies such as that by the MIT International Motor Vehicle Program show the European producers to lag significantly behind all North American producers in efficiency and intrinsic quality. While the differing driving tastes of American and European consumers may limit exports, we should not ignore the medium-run potential this market will offer. Ford and GM have an extensive production base within Europe, but Chrysler and the Japanese "transplants" may find the U.S. an attractive production base for sales in the EC, and even GM and Ford may wish to export "niche" vehicles. We need to be careful that cars built in the U.S. by American workers are not arbitrarily excluded. (This, of course, will be important for many other industries as well.)

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Womack, James P., Daniel T. Jones and Daniel Roos, *The Machine That Changed the World,* New York, Rawson Associates, 1990.

Representative HAMILTON. Thank you, Dr. Smitka. Dr. Procassini.

STATEMENT OF ANDREW A. PROCASSINI, PRESIDENT, SEMICONDUCTOR INDUSTRY ASSOCIATION

Mr. PROCASSINI. Thank you, Mr. Chairman. I have already submitted a formal and extensive testimony, and with your permission I would like to present a brief statement that is based on figures 1 through 10 of the handout that you have all received.

Since 1957, Japan has had a formal act, the Electronics Promotion Act, where the Japanese government and industry have implemented an industrial policy in electronics, which has impacted the United States and many other countries. This policy includes protected markets, subsidies, relief from antitrusts, research consortiums, low-cost loans, over-investment, enforced technology transfer and limited foreign investment.

And, the results are very easy to see in figure 1 when you can see the comparative shares of the United States in the worldwide electronics market. In 3 years, from 1984 to 1987, was a dramatic decline in virtually every segment of electronics.

And, although this is a 3-year time picture, the process began to occur in the 1960s and is continuing to this day.

In semiconductors specifically, if you turn to figure 2, we have what is called an X chart. And, in many industries with the United States versus Japan, you will see this X chart showing where the United States share market in semiconductors declined dramatically while the Japanese share increased substantially.

One of the major reasons has been the historical closed Japanese market. And, one can see in figure 3 that regardless of all of the activities taken or the macroeconomic effects, Japan has been able to maintain the United States share in Japan at an average of about 10 percent while we have held 60 percent or more in semiconductors in every other part of the world.

In order to correct this, in 1986 the United States and Japan signed a U.S.-Japan Semiconductor agreement which committed Japan to increase the share of foreign companies in Japan to at least 20 percent.

In figure 4, you can see that although some progress has been made we are not at 20 percent. We are at somewhere at about 13 percent. We have gained additional revenues for foreign companies but have not achieved the results agreed upon in the agreement.

A new agreement will be needed. And, the SIA is working towards a new agreement that we hopefully can sign with Japan in 1991.

Another aspect of Japan's policy has been predatory pricing, which has led to dumping. And, in figure 5 there is an example of a statement put out by Hitachi salesmen during a period of severe dumping where their salesmen were encouraged to sell at any price regardless of costs. This is as clear an instance of dumping as you can find.

In figure 6, you can see that the findings by the Department of Commerce indicated that severe dumping had taken place. And, these are rather large dumping margins.

Part of the reason that Japanese companies can survive such severe dumping is because they are parts of very large integrated electronics firms compared to primarily merchant firms of the United States. And, as you can see in this chart, Hitachi, for example, is almost a $50 billion company; whereas, the largest American semiconductor operation is only part of a $10 billion dollar Motorola.

These firms, through their abilities and relationships with banks, can achieve capital spending levels that are much higher and at lower costs. And, in figure 8, the history from 1984 to 1990 with a projection to 1993 indicate that capital spending by Japanese companies in the semiconductor industry will far exceed those of the United States.

And, if capacity is increased at that rate, that capacity will have output which will far exceed ours.

The special relationships that Japanese companies have with other firms is shown in figure 9 which demonstrates the Sumitomo keiretsu which allows the type of integration, vertically and horizontally, for them to achieve the types of results that they achieve.

In figure 10, a short history from 1971 to 1991 indicates that this area of semiconductors has been a battleground in trade for many years. This is not a new phenomena. It is one that has existed for quite some time.

In conclusion, I would like to make the following recommendations: First, we must have access to Japan's electronic markets as well as other markets. Japan is now the largest electronics equipment producer in the world. And, if we do not have access to that

market, we will be deprived of the revenues necessary to support R&D and capital spending.

Second, we need effective anti-dumping measures. And, it appears that some of the countries of Asia have been supporting weaker anti-dumping measures at GATT and other places. And, we are not—we are opposed to such weakening of any anti-dumping measures.

Third, the industry requires patient affordable capital. The semiconductor industry is a high technology industry, spends on the average 15 percent of its revenue per year in capital equipment. And, in that capital equipment is embedded technology that cannot be obtained in any other way.

Without a source of patient affordable capital, we will not be able to build the facilities to maintain our share of market.

Fourth, we need a stronger united electronics industry in terms of cooperative efforts and cooperative efforts with government as well as with firms and other industries.

And, fifth, the United States needs a coherent technology policy. I have here a book from Japan, "Institute for Future Technology," which reviews 2,000 technologies, where they are headed, what their success factors are and so on. And, there is no similar activity that we have in the United States except those produced in relatively small studies.

So, in effect, I believe that those five suggestions that I would like to make are extremely important to our industry and I believe would be extremely important to the United States.

Thank you very much.

[The prepared statement of Andrew A. Procassini follows:]

PREPARED STATEMENT OF ANDREW A. PROCASSINI

The Semiconductor Industry Association is grateful to have the opportunity to testify at this hearing on the Japanese economic challenge. My name is Andrew Procassini. I am the president of the Semiconductor Industry Association and I am representing SIA today.

The Semiconductor Industry Association, which represents U.S.-based semiconductor manufacturers, was created in 1977 to address the public policy issues confronting the industry. SIA member firms represent over 90 percent of the American semiconductor industry. SIA list of member companies is attached.

SIA concentrates its energies on those issues which affect the ability of the industry to remain internationally competitive, such as access to foreign markets, enforcement of our trade laws against unfair trade practices, and technology policy.

THE JAPANESE CHALLENGE IN SEMICONDUCTORS AND ELECTRONICS

I am pleased that the Joint Economic Committee has decided to hold these hearings on the Japanese economic challenge. Responding to this challenge has been a central concern of SIA's public policy agenda. In the same way that the United States has for years defined its national mission as the containment of Soviet power, Japan has set its sights on dominance of information technology and the global electronics industry. It's fair to say that both countries have succeeded. In the 1980s, we witnessed both the collapse of Communism *and* a decisive shift in the balance of technological power in Japan's favor.

Japan has been declaring victory since 1981. In a paid advertisement in *Scientific American*, the Japanese industry predicted that Japan would become the "epicenter" of the global electronics industry.[1] These predictions have proven accurate. It is

[1] Gene A. Gregory and Akio Etori, "Japanese Technology Today", *Scientific American*, October 1981, pp. 15-46.

predicted that by 1992, Japanese companies will capture $360 billion of the $1.07 trillion global electronics market, compared to $332 billion for the United States. The erosion of America's position is occurring throughout the entire electronics foodchain:

• Semiconductors: From 1980 to 1989, U.S. world-wide semiconductor market share has declined from 57 percent to 35 percent, while Japan's share has increased from 27 percent to 52 percent.

• Semiconductor materials and equipment: In 1980, all of the top ten equipment manufacturers were U.S.-owned companies. In 1989, four of the top five were Japanese. Industry analysts predict that Japan will have 56 percent of this market by 1993, compared to 32 percent for the United States.

• Consumer electronics: U.S. presence in the consumer electronics industry is negligible. According to the Office of Technology Assessment, "much of what remains is domestic 'screwdriver assembly' of components and subassemblies produced abroad." [2]

• Computers: Although the United States still maintains a commanding share of world markets, Japan is taking the lead in portable and laptop computers because of its expertise in high-volume manufacturing and miniaturization. Japanese computer manufacturers are reaching parity with IBM mainframes. U.S. computer companies are becoming increasingly dependent on their Japanese competitors for critical components such as semiconductors and flat-panel display.[3]

I wish I could tell the Committee that there is light at the end of the tunnel, and that I am optimistic about the future. Unfortunately, the United States is continuing to lose world-wide market share in semiconductors at about 2 percentage points per year. Since 1984, the Japanese semiconductor industry outspent the U.S. industry on plant and equipment and R&D by $12 billion. This gap is conservatively projected to rise to $15 billion between 1990 and 1994.

If we fail to address this crisis, the consequences for America's economic prosperity and military security will be severe. Semiconductors drive technological advances in computers, telecommunications equipment, consumer electronics and advanced weapons systems. As the National Advisory Committee on Semiconductors put it: "If the U.S. position in semiconductor devices, equipment and materials continues to deteriorate, the entire domestic electronics products industry will be at the mercy of foreign suppliers." This concern is validated by the growing number of reports that Japan is using its dominance in semiconductors as a competitive weapon in other segments of the electronics industry, an industry which employs 2.6 million Americans, more than double the number employed by the steel and auto industries combined.

The Defense Department is also becoming increasingly concerned about its dependence on foreign semiconductors. In 1987, the Defense Science Board concluded that the decline of the U.S. semiconductor industry posed a threat to U.S. national security. Defense communication satellites, air-to-air missiles, radars and the F-16 fighter are just a few of America's advanced military systems which are dependent on foreign semiconductors.[4] Shinataro Ishihara, a member of Japan's ruling Liberal Democratic Party, suggested in *The Japan That Can Say No,* that if "Japan sold chips to the Soviet Union and stopped selling them to the U.S. this would upset the whole military balance."

THE HISTORY OF JAPAN'S SEMICONDUCTOR POLICY

There are many reasons for Japan's overall economic success: a well-educated work-force, a high savings rate, and a number of business practices (e.g., continuous improvement, a focus of manufacturing, an emphasis on the long-term) that U.S. firms ignore at their peril. To understand how Japan has managed to establish such

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[2] U.S. Congress, Office of Technology Assessment, *The Big Picture: HDTV & High-Resolution Systems,* OTA-BP-CIT-64 (Washington, DC: U.S. Government Printing Office, June 1990), p. 1.

[3] According to one estimate, twenty percent of the value of the Apple II computer, introduced in 1977, was accounted for by Japanese components. Seventy percent of Steve Jobs' New Inc. computer, introduced in 1988, is accounted for by Japanese components. See Andrew Pollack, "Japanese Portables Threaten American Lead in Computers", *The New York Times,* November 24, 1990.

[4] U.S. Department of Defense, Office of the Undersecretary of Defense for Acquisition, *Report for the Defense Science Board Task Force on Defense Semiconductor Dependency,* February 1987. The Defense Science Board concluded that (1) U.S. military forces depend on technological superiority; (2) electronics provides the foundation for U.S. technological leadership; (3) semiconductors are essential to leadership in electronics; (4) high-volume production can only be sustained by commercial (as opposed to defense) demand, and the U.S. is rapidly losing high-volume markets; (5) leadership in semiconductor technology will soon reside abroad.

a commanding presence in a technology invented by the United States, however, it is necessary to discuss both Japan's economic strategy and the nature of its industrial structure.

Japan's leaders have never believed that market forces alone are sufficient to ensure economic prosperity.[5] Since Japan has long recognized that semiconductors are the "industrial rice" of the information age, the government has used a wide range of policy instruments to protect and promote an indigenous semiconductor industry: formal and informal protection, restrictions on foreign investment, forced technology transfer, subsidies, formation of R&D consortia, and encouragement or tolerance of anti-competitive activities. Japan's industrial structure is also an important piece of the puzzle. The Japanese semiconductor industry is composed of large, vertically-integrated electronics companies which belong to Japan's major industrial groups. These companies have been able to finance enormous investments in semiconductor production and R&D, drive American products out of key markets by selling below cost, and realize the economies of scope associated with producing a wide range of electronics goods.

Protected home market: Japan would not have been able to establish a semiconductor industry without an unjustifiably long period of infant-industry protection. Even today, access to the Japanese problem remains a serious problem for foreign semiconductor manufacturers. Prior to the 1970s, the Japanese semiconductor market was protected by a wide range of formal and informal barriers. Imports were restricted by prior approval requirements and quotas. Investment in semiconductors was restricted by placing the industry on the so-called "negative list." This meant that foreign majority ownership in such industries was not permitted without prior government approval, which was almost never granted. Those U.S. firms which were allowed to establish subsidiaries in Japan were often forced to agree to production limits and license their technology to their Japanese competitors.[6]

These restrictions were reinforced by other measures. 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.

In 1971, the Nixon Administration mounted a major effort to induce Japan to liberalize imports of computers and computer parts. The Japanese initially resisted U.S. pressure, but eventually agreed to liberalize after the United States threatened to lodge a complaint under the General Agreement on Tariffs and Trade. Liberalization of semiconductor imports was phased in stages from 1971 to 1974, with the least complex products liberalized first, and investment was liberalized from 1974 to 1975.

However, at the same time the Japanese government agreed to eliminate these formal restrictions, it was also developing a series of "liberalization countermeasures" to offset the impact of liberalization. These countermeasures included subsidies, government sponsorship of joint R&D projects, continued administrative guidance to buy Japanese, the creation of horizontal links between Japanese producers, an organized division of product markets, and encouragement of tight relationships between Japanese producers and consumers of semiconductors. As a result of these steps, U.S. share of the Japanese market in the post-liberalization period remained virtually the same (generally around 10–11 percent) as the U.S. share during the period of formal protection. In specific product areas, U.S. companies encountered a recurring phenomena. They could achieve sales in Japan with a given device as long as sufficient quantities of a competing Japanese product were not available. As soon as Japanese firms could supply the product (at times a copy of the U.S. device), U.S.

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[5] One of Japan's postwar economic planners observed, "If Japan had adopted the simple doctrine of free trade and had chosen to specialize in (labor-intensive) industry, it would almost permanently have been unable to break away from the Asian pattern of stagnation and poverty . . . The Ministry of International Trade and Industry decided to establish in Japan industries which require intensive employment of capital and technology, industries that in consideration of comparative cost of production should be the most inappropriate for Japan, industries such as steel, oil refining, petro-chemicals, automobiles, aircraft, industrial machinery of all sorts, and later electronics, including electronic computers." Cited in Thomas K. McGraw, "From Partners to Competitors: An Overview of the Period Since World War II", in Thomas K. McGraw (ed.), *America versus Japan*, Harvard Business School Press, Boston, 1986, p. 9.

[6] Texas Instruments negotiated with MITI for 4 years before it was allowed to establish a wholly owned subsidiary in 1968. In exchange, TI had to establish an equal partnership joint venture with a Japanese electronics company, "consult" with MITI about its Japanese production level and market share, and license its proprietary technology to Japanese firms. See Dennis J. Encarnation and Mark Mason, "Neither MITI nor America: the political economy of capital liberalization in Japan", *International Organization*, winter 1990.

firms' sales fell dramatically, sometimes to zero. 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.

In 1982, the U.S. and Japanese government began a series of bilateral discussions to address trade friction in semiconductors in the "High Technology Working Group." The Japanese government agreed to eliminate barriers to market access in high technology, and in 1983, MITI began to encourage Japanese companies to increase their purchases of U.S. semiconductors. Although initial signs were encouraging, increased U.S. penetration of the Japanese market lasted only as long as the worldwide boom in demand for semiconductors. In later 1984, as semiconductor demand started to decline, U.S. companies once more began to lose market share in Japan. U.S. companies in Japan reported that MITI was no longer encouraging Japanese firms to purchase U.S. chips, and Japanese firms showed little or no interest in forming long-term relationships. The failure of these agreements to produce any measurable results, combined with widespread dumping of semiconductors, led to the 1986 U.S.-Japan Semiconductor Trade Arrangement.

Promotional policies: In addition to limiting foreign access to the Japanese semiconductor market, MITI and other government agencies have used a variety of other policy tools to target the Japanese semiconductor industry:

- Capital was channeled to Japan's major electronics companies through the Japan Development Bank and other financial institutions such as the Industrial Bank of Japan and the Long-Term Credit Bank.
- MITI organized the VLSI project (1976–1979), an R&D consortia which allowed Japanese companies to take the lead in a number of important manufacturing process technologies. MITI is currently funding consortia and R&D projects in areas such as optoelectronic integrated circuits, Josephson junctions and nanometer technology.
- Japan's tax laws continue to give special treatment for participation in R&D consortia, and investment in semiconductor manufacturing equipment and clean room technology.

These promotional policies have become relatively less important as Japanese companies have become financially strong and internationally competitive. Now that the industry has mastered high-volume commodity products, however, Japan wishes to push forward the technological frontier and establish itself as the center of innovation and technological leadership in the world economy. Japan's science and technology programs are stimulating and coordinating investment in long-term, high-risk areas. U.S. industry will be hard-pressed to match this investment. In X-ray lithography, for example, one senior researcher at NTT observed, "Japan is undoubtedly head and shoulders above its rivals in SOR (synchrotron orbital radiation) research. I don't see how U.S. makers believe that they can survive with their current paltry spending on X-ray lithography devices." [7]

Japan's industrial structure: Clearly, government policy is not sufficient to explain the ascendance of the Japanese semiconductor industry. As noted above, Japanese semiconductor producers are large, vertically-integrated electronics companies. Six Japanese firms produce 85 percent of Japanese semiconductors, 80 percent of Japanese telecommunications equipment, 80 percent of Japanese computers and 60 percent of Japanese consumer electronics. As figure 7 shows, these companies are much larger than U.S. semiconductor manufacturers.

This is important for several reasons. First, it helps explain the dumping episode of 1985–86, which drove six out of eight U.S. DRAM producers from the market. The Japanese industry maintained high rates of capital spending during this period even though the demand for semiconductors dropped sharply. The result was predictable: substantial overcapacity and Japanese sales at a fraction of costs. In EPROMs, for example, the Commerce Department found dumping margins of over 180 percent. Japanese companies have been willing and able to sustain large losses in pursuit of market share. They see control of the semiconductor market as a *means to an end*, namely, dominance in the goods which use semiconductors, such as computers and telecommunications equipment. U.S. semiconductor companies, on the other hand, derive a much greater percentage of their revenue from semiconductor products. They simply can not afford to lose billions of dollars.

Second, Japan's industrial structure also helps explain why the Japanese market has been difficult to penetrate. As both producers and users of semiconductors, Japanese companies have a vested interest in purchasing chips from their own semicon-

[7] "Japan Security Its Dominance In Memory Chip Market", *Kyodo News Service*, March 5, 1990.

ductor divisions. Finally, the size of Japan's electronics companies and their substantial cash reserves explain why the gap between U.S. and Japanese semiconductor investment is likely to continue to grow in the 1990s unless steps are taken to address this trend.

U.S. RESPONSE TO THE JAPANESE CHALLENGE

I am proud to say that the semiconductor industry has been at the forefront of efforts to restore America's technological pre-eminence. Over the years, SIA has pushed the R&D tax credit, the National Cooperative Research Act, intellectual property protection for mask-works, semiconductor tariff elimination in the United States and Japan, and technology initiatives such as Sematech and the Semiconductor Research Corporation.

On the trade front, SIA has continued to press for open markets and an end to Japanese dumping of semiconductors. In 1985, after the failure of the High Technology Work Group and massive Japanese dumping, SIA was forced to file a Section 301 petition, which ultimately resulted in the 1986 U.S.-Japan Semiconductor Trade Arrangement. Under the agreement, the Japanese government recognized the expectation of the U.S. industry that the foreign company share of Japan's semiconductor market would "grow to at least slightly above 20 percent" by 1991.

Once again, Japanese compliance with the agreement was not forthcoming. Because foreign share of the Japanese market remained stagnant, and dumping in third countries continued, President Reagan imposed sanctions of $300 million against Japanese goods in April 1987. Japan eventually stopped dumping semiconductors but, with only a year remaining in the agreement, Japan has yet to fully adhere to its commitments on market access.

Progress has been made, however. U.S. sales in Japan have increased from $875 million in 1986 to $2.1 billion in 1989, and U.S. share has increased by roughly 4 percentage points since the agreement was signed. Individual Japanese companies have developed concrete plans to increase their imports of foreign semiconductors. Industry-to-industry initiatives in areas such as consumer electronics, telecommunications, HDTV and the automotive sector are acting as a catalyst for increased sales and "design-ins" of U.S. semiconductors. U.S. chips, for example, are now used in Sony's CD players, Matsushita's camcorder, and Toyota's automotive electronics.

Because Japan did not begin these initiatives in earnest until 1988, foreign market share is likely to reach only 14 to 15 percent by the July 1991, the scheduled date for the expiration of the agreement. Essentially, by 1991, the door to the Japanese market will have been opened half-way. This represents a gain of $1.16 billion in sales, $130 million in investment, $137 million in R&D and 5,500 thousand jobs. On the other hand, these figures also represent the lost sales, R&D, capital investment and employment opportunities—since the agreement was only partially complied with.

POLICY OPTIONS FOR THE FUTURE

If I have learned anything during the 1980's, it is that there is no one silver bullet. I have seen SIA win a number of important public policy battles while continuing to lose the war. It's clear that progress must be made on a variety of fronts. Some of the changes which are required, such as the priority we attach as a Nation to remaining an economic superpower, the renewal of our educational system, our attitudes about the relationship between business and government, the level of cooperation within and between industries and firms, and the interaction between Wall Street and high technology industries, are so complex and so fundamental that it is difficult to determine how they can be achieved. Having said that, I can offer a number of policies that would strengthen the semiconductor industry:

1. Access to Foreign Markets: The United States must continue to press for access to the Japanese semiconductor market. Access to Japanese market is important for the following reasons:

- Japan is now the world's largest semiconductor market. In 1989, Japanese semiconductor consumption was $23 billion, as compared to $17.9 billion in the United States and $9.8 billion in Europe.
- High technology industries must amortize large investments in R&D and plant and equipment over a short product life cycle. If U.S. firms do not have access to foreign markets, they will not generate the funds they need to invest in the next generation of semiconductors.
- Semiconductor costs traditionally follow a "learning curve"—where cost reductions of approximately 30 percent are achieved for every doubling of cumulative output. For that reason, the continued cost competitiveness of the U.S. industry de-

pends on access to the Japanese market. A 1985 study commissioned by USTR, the Department of Commerce and the Department of Labor quantified this effect. The study's model demonstrated that a five percent gain in the Japanese DRAM market would lower the costs of U.S. semiconductor manufacturers by 4 percent and increase their share of their own market by 2.5 market share points.

• A closed home market gives foreign firms a sanctuary, which reduces the uncertainty associated with investment in new capacity. This, in turn, has often triggered overcapacity and below-cost sales.

The CEOs of America's major semiconductor and computer companies have agreed on the need for a new, 5-year U.S.-Japan semiconductor trade agreement. Under this proposal, developed by the Semiconductor Industry Association and the Computer Systems Policy Project (CSPP), foreign share of Japan's market would be expected to reach 20 percent by the end of 1992. The 1986 agreement eventually began in produce results because it contained quantitative targets, had strong support in Congress and the Administration, and contained enforcement mechanisms, including the use of sanctions. In addition, the U.S. industry aggressively increased its sales efforts, while the Japanese government and industry developed a number of initiatives which genuinely expanded market access. All of these elements must remain in place for the new agreement to build on the progress which has been made.

2. Effective Antidumping Measures: Although the semiconductor trade agreement has brought dumping under control, it is extremely important that the U.S. Government respond quickly to any future dumping. As the DRAM episode has demonstrated, dumping can irreparably damage the American economy, since it is very difficult to re-enter markets that have been ceded. SIA and CSPP have recommended a "fast track" mechanism to respond to future dumping, requiring less government intervention in the marketplace than the current system of Fair Market Values. SIA is strongly opposed to changes in the Antidumping Code that would have the effect of undermining U.S. law. Unfortunately, many of our trading partners, including Japan, are attempting to weaken the international disciplines against dumping during the Uruguay Round.

3. Patient, Affordable Capital: Unless means can be found to bridge the large and growing gap between U.S. and Japanese R&D and capital spending, the U.S. industry will continue to lose market share. The NACS has suggested accelerating the depreciation of semiconductor manufacturing equipment from 5 to 3 years, a step which would boost investment with a modest revenue impact. Obviously, the U.S. semiconductor industry would also benefit from any measures which reduced real interest rates, such as an increase in private savings or a reduction in the Federal budget deficit. The "cost of capital" issue is particularly important for the semiconductor industry because the cost of a "fab" for leading-edge memory devices is at least $400 million, and will likely be twice that for the next generation. Because these investments are so large and risky, antitrust reform to permit joint manufacturing ventures would also stimulate investment. Few firms will be able to afford these investments without pooling risk and sharing costs.

4. A Stronger and More United Electronics Food-Chain: The U.S. electronics industry is highly interdependent. U.S. semiconductor manufacturers were hurt by the loss of the consumer electronics industry in the 1960's and 1970's, because this caused a large portion of the market to move offshore with it. The U.S. semiconductor industry is also concerned by its growing dependence on foreign semiconductor manufacturing equipment. There are press reports that U.S. semiconductor companies are not receiving the most advanced Japanese semiconductor manufacturing equipment.[8] In an industry with such short product life cycles, even delays of a few months can be costly. These trends argue for much closer cooperation between producers up and down the food chain: from materials and equipment to semiconductors to computers.

5. A Coherent Technology Policy: In 1989, the Federal Government spent roughly $64.3 billion on research and development. Unfortunately, very little of that $64.3 billion was designed to enhance our industrial competitiveness. There are some encouraging signs from the administration. The Commerce Department is creating an Industrial Technology Advisory Board to increase private sector input into Federal R&D priorities. The Department of Energy is reexamining the roles and missions of the national labs. OSTP has developed an Administration statement on technology policy which includes support for "generic, pre-competitive" technologies. But to

[8] See, for example, Robert Hof and Neil Gross, "Silicon Valley Is Watching Its Worst Nightmare Unfold," *Business Week*, September 4, 1989, p. 63.

give you an idea of the relative amount of progress which remains to be made, Japan's Science and Technology Agency released an 892 page report in 1988 outlining a year-by-year technology strategy for over 1,000 technologies until the year 2015.[9]

CONCLUSION

It is not my belief that the challenges the semiconductor industry faces are insurmountable. The industry still leads in EPROM's, microprocessors, ASIC's and other design-intensive semiconductors. America still leads the world (for now) in computers and software. As a country, America's openness to new ideas and immigrants and her world-class universities are formidable competitive assets. I do know, however, that we *are* done for if we have another six years of drift, happy-talk and rose-colored glasses. It all boils down to some simple questions. Are we going to go about the serious business of building an American economy that is second to none, or will we arrange the deck chairs on the Titanic? Do we care what future generations of Americans think of the choices we made, or will we be content to go for the quick buck? Will we be inspired by a healthy, forward-looking economic patriotism, or will we throw up our hands and settle for second-best? These are the questions we must answer as individuals and as a Nation.

[9] The study, the fourth in a series, used the Delphi method to survey over 3,000 specialists in industry, academia, government and industry associations. For each technology, the study measured degree of importance, time of realization, constraints on realization, entities, promoting the necessary research and development, and the role of government. Previous surveys have been more than 70 percent accurate in the area of electronics.

Table10 U.S. Share of Worldwide Electronics Markets
(1984 and 1987)

	Percent		Worldwide Market
	1984	1987	($B)
Silicon Wafers	85	22	$ >.01
Automatic Test Equip.	75	68	1.2
Semiconductor Mfg. Equip.	62	57	6.5
Microlithography Equip.	47	35	2.0
All Semiconductors	54	41	$38.1
ASICs	60	50	7.3
DRAMs	20	8	3.4
Microprocessors	63	47	1.7
Computers	78	69	$121.0
Personal Computers	75	64	47.2
Laptop Computers	85	57	1.6
Supercomputers	96	77	1.1
Computer Subsystems			
Displays	11	8	8.2
Flat Panel Displays	25	15	2.4
Floppy Drives	35	2	2.5
Hard Drives (up to 300 MB)	73	65	8.2
Hard Drives (up to 40 MB)	70	60	2.3
Dot Matrix Printers	10	8	4.8
Software	70	72	$44.5
Operating Systems	90	90	16.4
Data Base Mgmt. Systems	100	95	2.8
Spreadsheets	100	100	0.9
Telecommunications Equip.	33	32	$88.0
Central Office Switching	30	24	4.8
Fiber Optics	75	50	3.0
Private Branch Exchange	29	26	7.8
Data PBXs	100	36	0.2
Facsimile	30	25	3.1
Key Telephone Systems	28	22	5.7
Voice Mail Systems	100	100	0.6
LANs	100	98	2.4
Data Modems	49	37	3.2
Statistical Multiplexors	94	35	0.5
Instruments	52	46	$48.9
Medical Equip.	35	41	12.3
Photocopiers	40	36	$13.4
Consumer Electronics	19	12	$37.2

Source: Science & Electronics, U.S. Department of Commerce

FIGURE 1

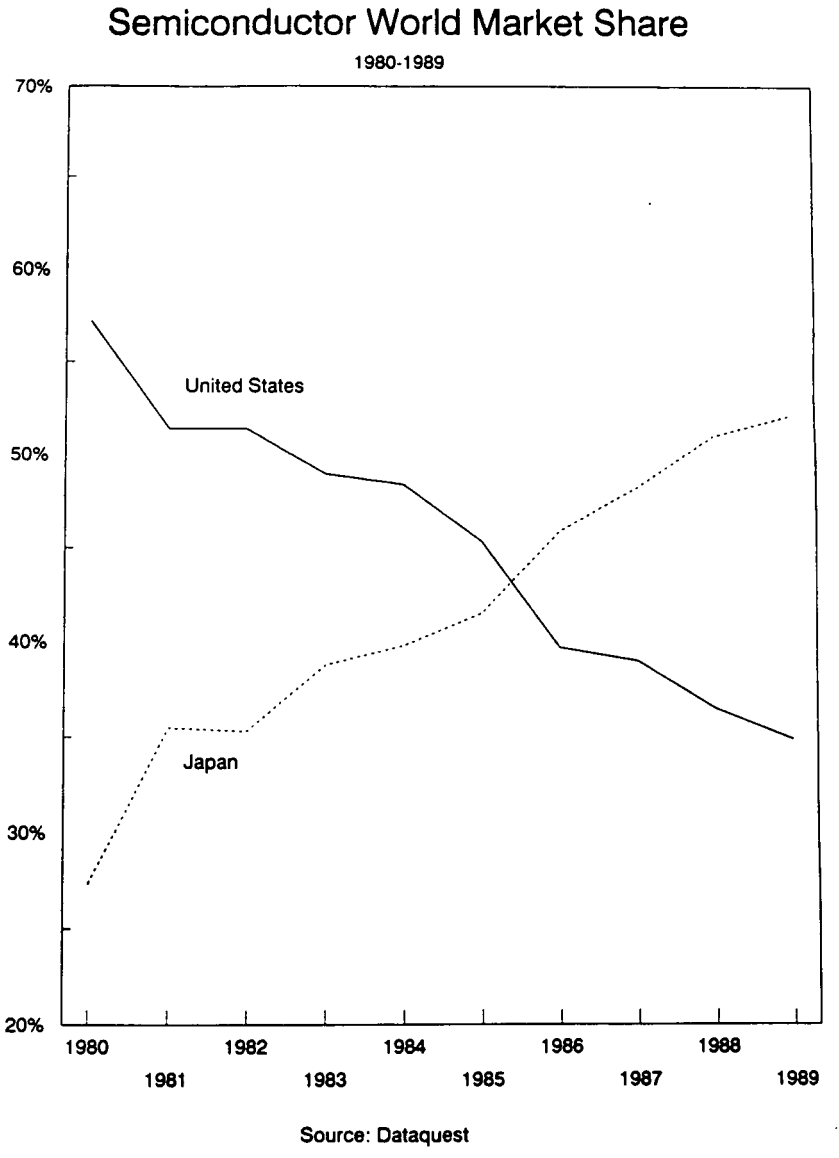

Semiconductor World Market Share
1980-1989
70%
60%
50%
40%
30%
20%
United States
Japan
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
Source: Dataquest

FIGURE 2

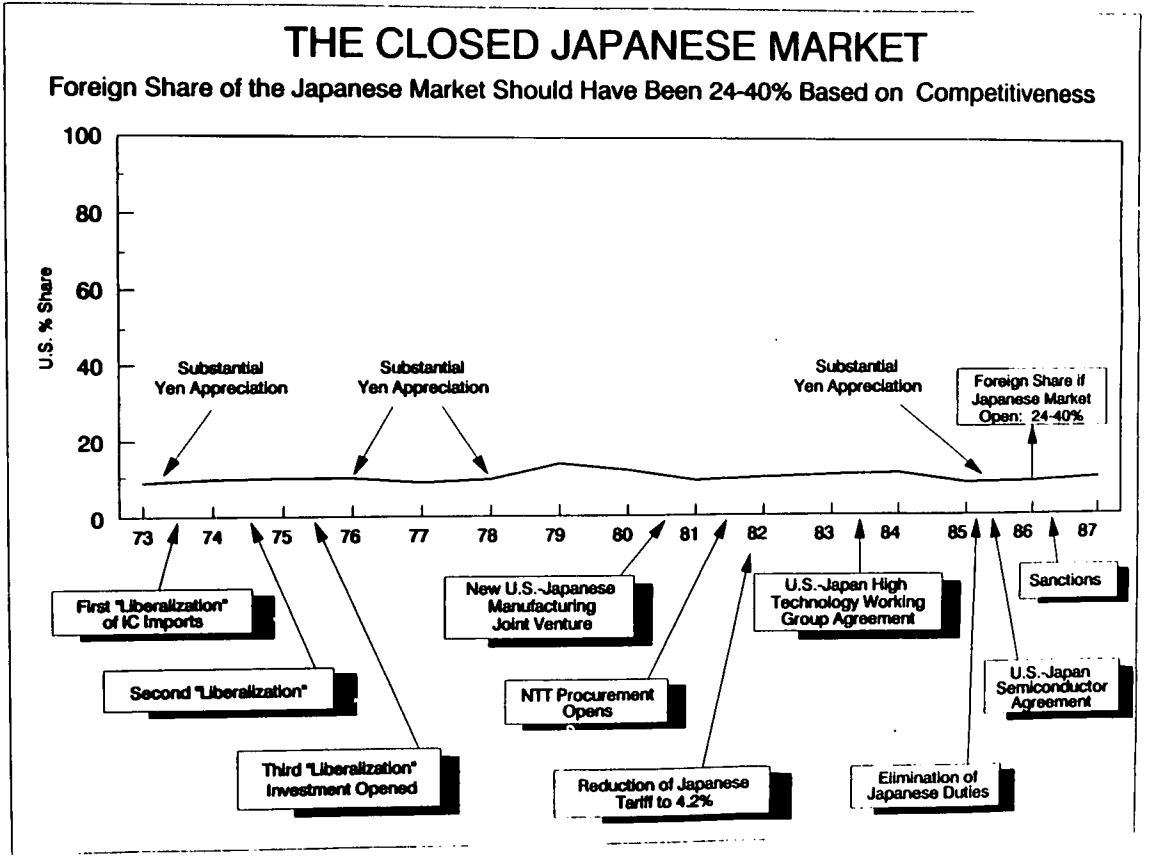

THE CLOSED JAPANESE MARKET
Foreign Share of the Japanese Market Should Have Been 24-40% Based on Competitiveness
U.S. % Share
100
80
60
40
20
0
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
Substantial Yen Appreciation
Substantial Yen Appreciation
Substantial Yen Appreciation
Foreign Share if Japanese Market Open: 24-40%
First "Liberalization" of IC Imports
Second "Liberalization"
Third "Liberalization" Investment Opened
New U.S.-Japanese Manufacturing Joint Venture
NTT Procurement Opens
Reduction of Japanese Tariff to 4.2%
U.S.-Japan High Technology Working Group Agreement
Elimination of Japanese Duties
Sanctions
U.S.-Japan Semiconductor Agreement

FIGURE 3

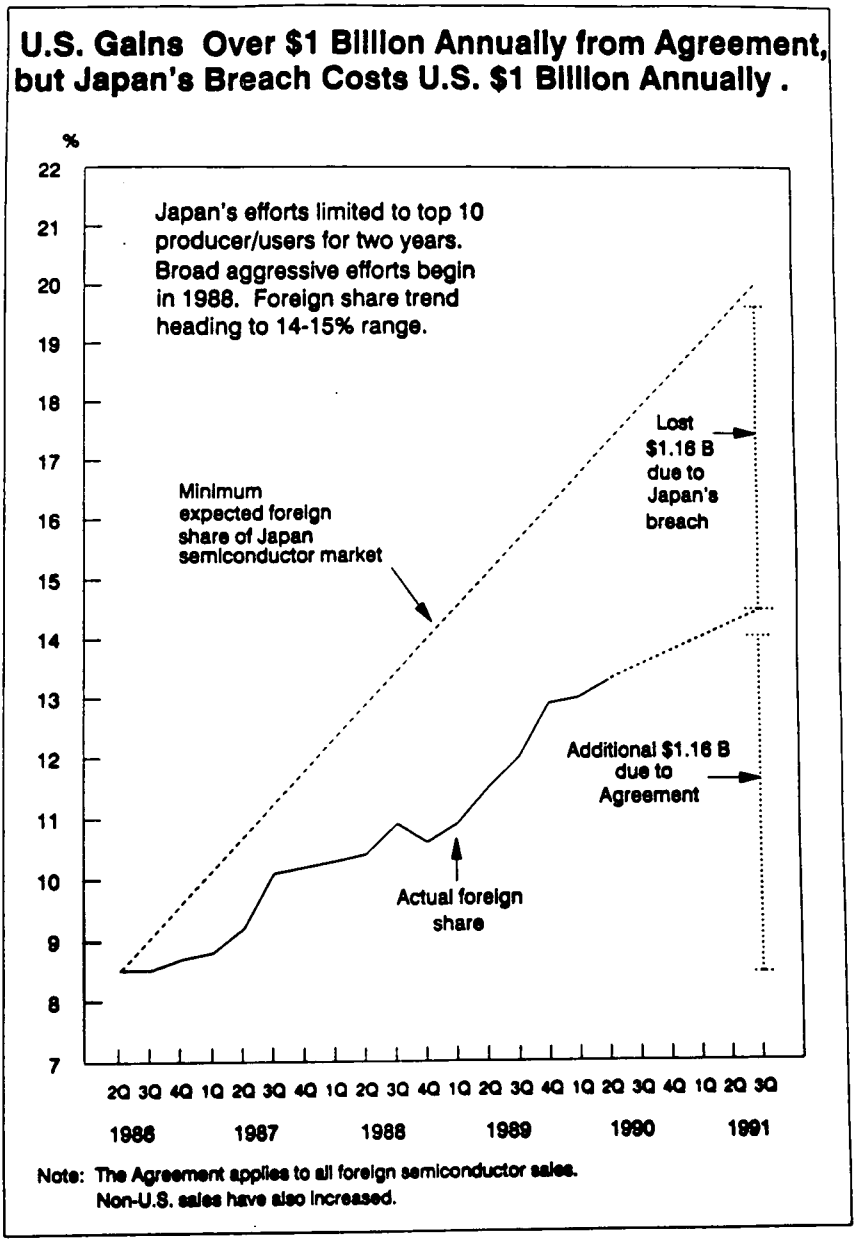

U.S. Gains Over $1 Billion Annually from Agreement, but Japan's Breach Costs U.S. $1 Billion Annually .
%
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
Japan's efforts limited to top 10 producer/users for two years. Broad aggressive efforts begin in 1988. Foreign share trend heading to 14-15% range.
Minimum expected foreign share of Japan semiconductor market
Lost $1.16 B due to Japan's breach
Additional $1.16 B due to Agreement
Actual foreign share
2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q
1986
1987
1988
1989
1990
1991
Note: The Agreement applies to all foreign semiconductor sales. Non-U.S. sales have also increased.

FIGURE 4

Japanese EPROM and DRAM Pricing Below Cost .

WIN WITH THE 10% RULE

HN4827128, HN27256

Find AMD and Intel Sockets . . .

Quote 10% Below Their Price . . .

If They Requote,

Go 10% Again . . .

Don't Quit Till You Win!

25% DISTI PROFIT MARGIN GUARANTEED.

HITACHI MEMO TO EPROM DISTRIBUTORS, FEBRUARY, 1985

FIGURE 5

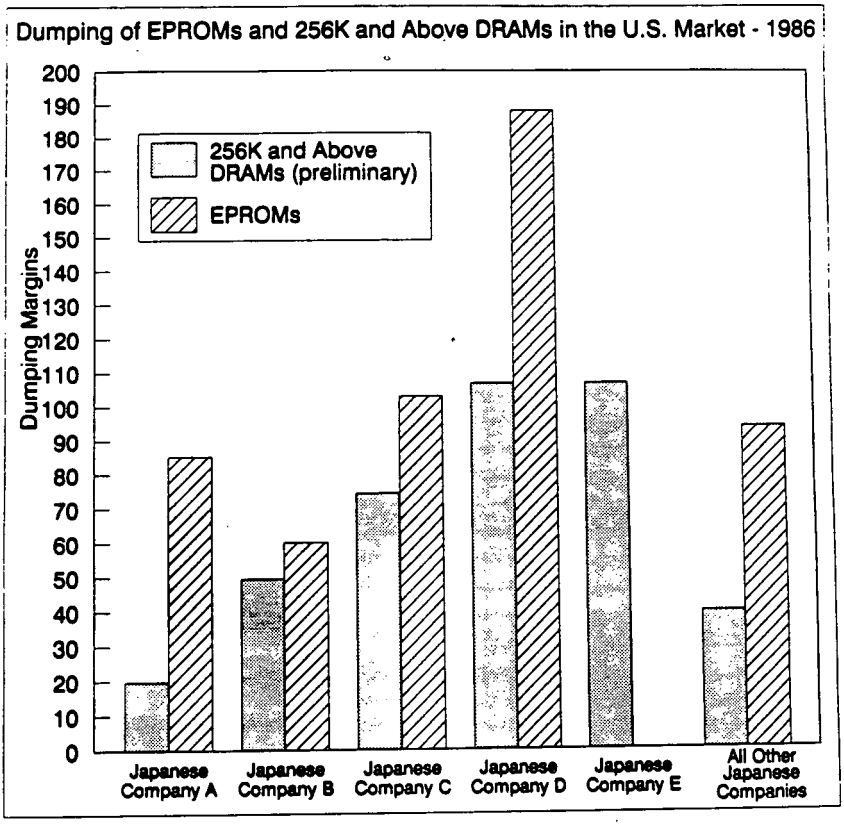

Dumping of EPROMs and 256K and Above DRAMs in the U.S. Market - 1986
Dumping Margins
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
256K and Above DRAMs (preliminary)
EPROMs
Japanese Company A
Japanese Company B
Japanese Company C
Japanese Company D
Japanese Company E
All Other Japanese Companies

FIGURE 6

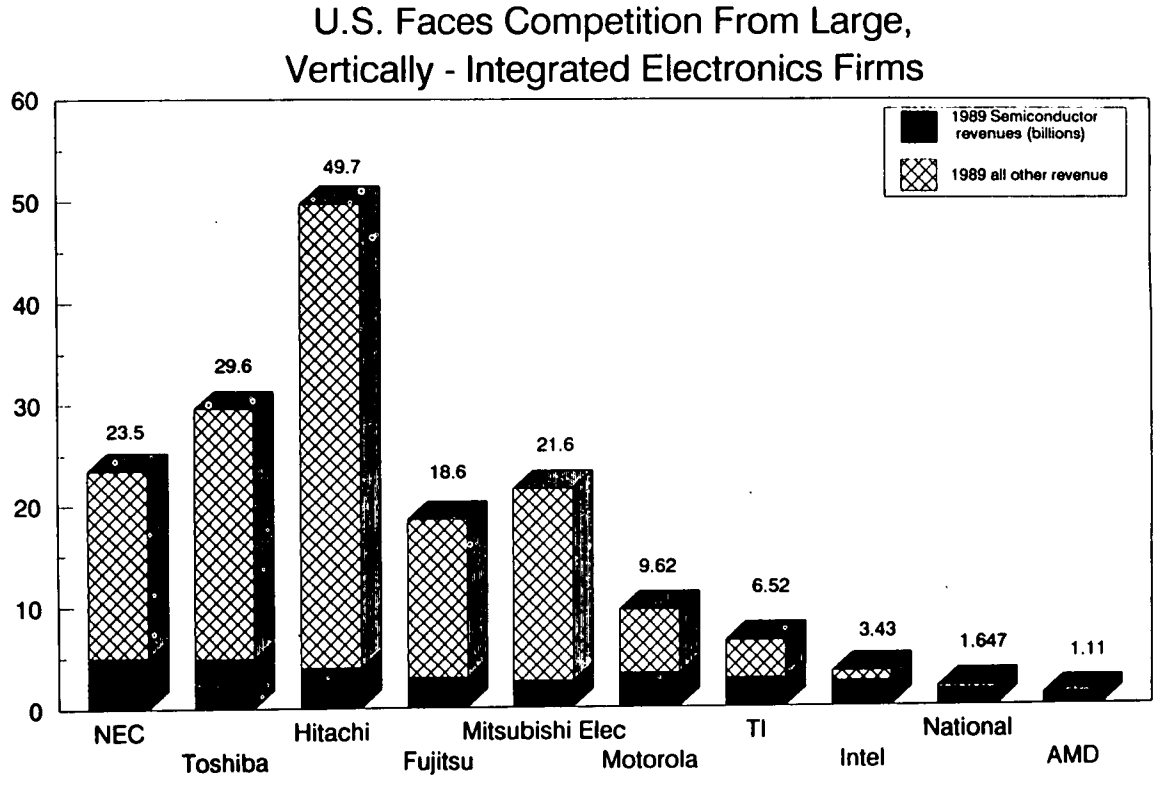
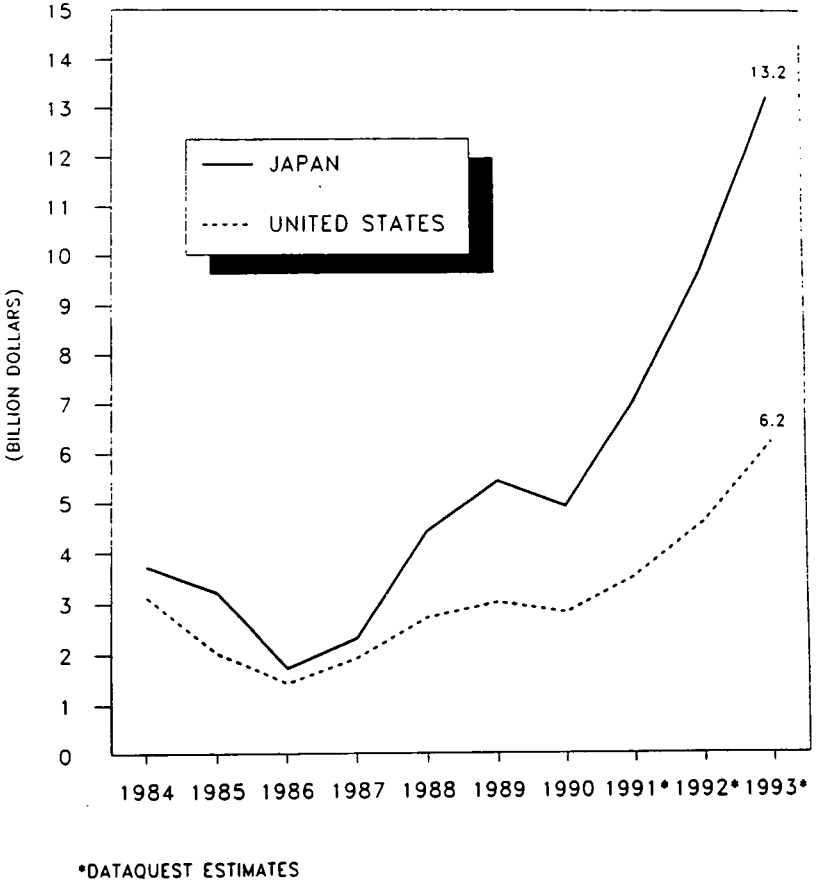

U.S. Faces Competition From Large,
Vertically - Integrated Electronics Firms
1989 Semiconductor revenues (billions)
1989 all other revenue
60
50
40
30
20
10
0
23.5
29.6
49.7
18.6
21.6
9.62
6.52
3.43
1.647
1.11
NEC
Toshiba
Hitachi
Fujitsu
Mitsubishi Elec
Motorola
TI
Intel
National
AMD

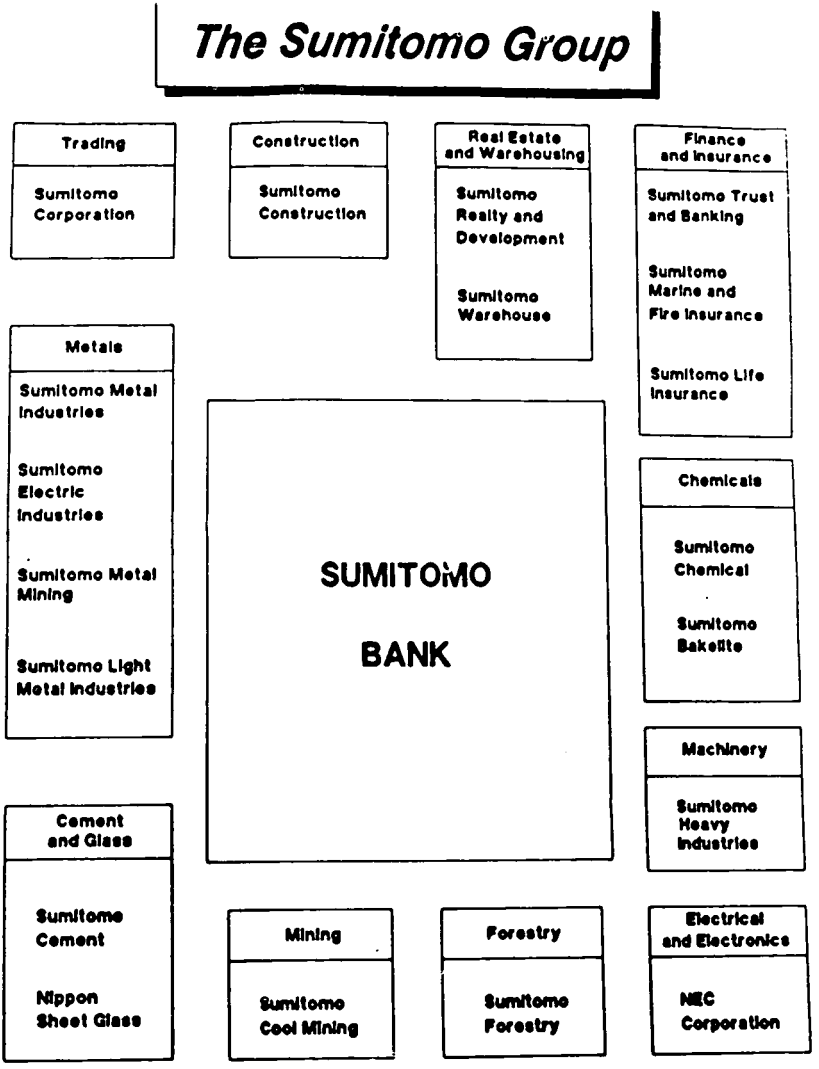
FIGURE 7

SEMICONDUCTOR CAPITAL SPENDING: UNITED STATES vs. JAPAN



*DATAQUEST ESTIMATES

FIGURE 8



Source: Mario Anchordoguy, University of Washington.

FIGURE 9

TWENTY YEARS OF U.S.-JAPAN SEMICONDUCTOR TRADE

1971	Prime Minister Sato agrees to liberalize semiconductor market
1973	MITI announces "counter-liberalization" measures
1975	MITI organizes VLSI Program
1982	High Tech Work Group
1985-86	Japanese dumping drives 6 of 8 U.S. DRAM producers from market
1986	U.S.-Japan Semiconductor Trade Agreement
1987	President Reagan imposes sanctions for violation of agreement
1989	U.S. share of worldwide market falls from 57 percent in 1980 to 35 percent in 1989. Japanese share increases from 27 percent to 52 percent.
1990:Q2	Foreign share of Japanese market at 13.3 percent
1991	Semiconductor agreement scheduled to expire

FIGURE 10

Representative HAMILTON. Thank you, Dr. Procassini. Dr. Christelow.

STATEMENT OF DOROTHY B. CHRISTELOW, CONSULTANT, INTERNATIONAL ECONOMICS, NEW CANAAN, CONNECTICUT.

Ms. CHRISTELOW. I am delighted to be here today to summarize my contribution to "Japan's Economic Challenge." The title for this collection reminds me of Servan-Schreiber's 1967 bestseller, "The American Challenge," about U.S. multinationals' investment invasion of Europe.

To meet the challenge, he proposed that European businesses and governments study the elements of U.S. success and do likewise. Almost as an afterthought, he noted that the Japanese also were encountering an American challenge and seemed to be faster learners.

One of Japan's main learning tools was the United States-Japan joint venture. The Japanese government greatly preferred that its industries buy technology and develop by themselves. But, when sellers were not forthcoming, they encouraged joint ventures in manufacturing with foreigners, inducing those foreigners to invest by barring wholly owned direct investment in most cases.

When Servan-Schreiber was writing, U.S. firms manufacturing affiliates in Japan amounted to only $1.5 billion. And, they were concentrated in chemicals, industrial and business machines. Most of them were joint ventures and they generated a flow of technology from the United States to Japan.

In 1988, U.S. firms' manufacturing affiliates in Japan had $60 billion in assets, around 80 percent in joint ventures, although joint ventures had not been required since 1974. At the same time, Japanese companies had moved to the United States, and I estimate that their manufacturing affiliate assets came to about $40 billion of which about a third are in joint ventures.

So, in fact, both United States and Japanese firms today use the joint venture technique to gain technology and skills from their partner.

My paper is concerned with how, why and in which direction these flows are flowing. I conclude that the flow could now be more strongly to than from the United States.

Direct investment in manufacturing involves international transfers of both financial capital and intangible assets, notably in the case of manufacturing technology and manufacturing skills. These ventures can be wholly owned by the investor from another country, or they may be jointly owned by a company in the host country and another in the foreign country with the ownership divided between the two in some way that gives both a policy say.

One can also have a company which is owned partly by a foreign manufacturer, again holding an important but noncontrolling interest in that company. One example of that would be Isuzu, in which General Motors has held close to 40 percent.

Joint ventures are more difficult to manage than wholly owned ventures, given the differences in corporate cultures of the two partners and probably very different corporate objectives. But, sometimes they also have advantages.

One advantage is the more certain spread of technology and production skills in the receiving country. A wholly owned manufacturing venture usually exploits its own superiority and transfers these intangible assets to the host country.

But, the welcome it receives depends on whether those transfers drive domestic businesses, domestic firms, out of business or whether they spur domestic firms to added efforts and to improved technology.

The second advantage is that they provide for some firms who have perhaps some but not all of the qualities needed for success to trade what they have for what they need. In this case, one can see that technology production skills and capital are not likely all to be flowing in the same direction.

One indication of which way technology, and production skills, are flowing in current joint ventures is the distribution of their assets among major industry groups ranked according to the two countries' relative strengths in world trade. The presumption is that if one country has a strong advantage, the joint venture partner in the other country is likely to be gaining the technology.

However, if the two industries are fairly evenly matched, one can also see that there are possibilities for trading and that both companies have an opportunity to learn.

An update of table 3 from my contribution to this collection shows the results of such an exercise for those industries where roughly comparable trade and investment data were available. The trade ranking of each of these industries has been derived from statistics on trade in industrial countries. The table covers 80 percent of all United States-Japan joint ventures in both countries, in each country.

In both samples of joint venture assets, we find a larger percentage of those assets in industries where Japan now has a comparative advantage. You can see that they are mostly in road motor vehicles and also in the United States in steel, coming to 72 percent of all assets in Japan and 39 percent in the United States.

In industries where the United States is stronger, the percentages are much smaller—16 percent in Japan and only four percent in the U.S. Those industries are chemicals and pharmaceuticals.

There is also an important middle group where the two countries' strengths have recently become more evenly matched. These are industrial machinery, computers and sophisticated electronics. These account for 13 percent of the total in Japan but 57 percent in the United States.

Looking at this array of industries, we can see that the United States excels in the technology intensive chemicals industries while Japan excels in automobiles and steel, where mass production skills and quality controls are of prime importance. In the middle group, one finds sub-industries like semiconductors, where the same distinctions apply. The U.S. excels in the high-tech microprocessors while Japan leads in the mass produced memory chips.

At a minimum, we would expect United States-Japan joint ventures to transfer a sample of this critical missing ingredient to the partner lacking it. Say, transferring how to make DuPont's spandex to a Japanese company or part ownership in an efficient automobile assembly plant to a U.S. company.

But, at best, joint ventures should also promote scientific research skills in Japan and more efficient production methods in the United States. The extent to which this transmission of basic aptitudes and skills actually occurs has much to do with which country benefits from the joint ventures.

So, let's look at a few examples. In industries where the U.S. is stronger and thus Japan should gain more, most joint ventures have been in industrial chemicals. These include plastics, resins and fibers that are used in textiles, automobiles, packaging, building and other industries.

Most joint ventures in Japan were established in the 1980's, among old and new partners, including roughly half of all major U.S. firms and half of all the Japanese firms. The U.S. firms' readiness to enter joint ventures, despite their technology lead, is related to their customers' membership in keiretsu which, as you may remember from Dick Nanto's testimony, are groups of firms centered either on a lead bank or a large company. Members hold equity positions in one another and forge supply links with one another.

The keiretsu link for a U.S. company is presumably helpful in competing against other Japanese companies, other U.S. companies and other foreign companies. DuPont has seven joint ventures in industrial chemicals alone in seven product lines with seven different Japanese companies belonging to four different keiretsu. That's the way to get into the market.

In all of these joint ventures in industrial chemicals and pharmaceuticals, the Japanese have gained new technology. In some of them, they have also gained some research experience.

Turning to industries where Japan is stronger, I am only going to look at automobiles, since this is an industry in which we find joint ventures both in Japan and in the United States. Most joint ventures in Japan were formed in the 1970's when Japan's superiority was confined to small cars.

The biggest are GM's investment in Isuzu and Chrysler's joint venture with Mitsubishi Heavy Industries in Mitsubishi Motors, both made in 1970; and Ford's investment in Mazda in 1979. These and other early joint ventures in parts manufacturer provided financial assistance to these smaller Japanese companies.

They also provided parts technology—automatic transmissions, catalytic converters and disk brakes—to the entire Japanese industry.

The U.S. companies, on the other hand, got small cars for sale under their own name plates in the United States at a time when the U.S. companies had had difficulty in making such cars themselves. But, I have found no evidence that in the 1970's they considered these particular ventures as role models for efficient production methods.

Joint ventures in the United States were initiated in the 1980s when Japanese companies had made considerable further progress in production methods and quality controls and were making competitive inroads in mid-size cars. To counter restraints on their exports, all Japanese companies invested in U.S. production.

Toyota and Nissan were probably motivated to include joint ventures in their U.S. investment plans by a desire to defuse anti-Jap-

anese sentiment in this country. U.S. auto companies welcomed these joint ventures with the big two and also their long standing ventures with Mazda, Mitsubishi and Isuzu, as those three companies also came to the United States.

And, the U.S. auto companies have found various ways of learning from their Japanese partners. And, I cite two.

GM has taken the role of observing closely, then imitating. Their venture with Toyota, Nummi, is operated entirely by Toyota, drawing on parts from their own and GM suppliers.

At least in the early years, GM is reported to have sent as many as 1,000 managers a year for brief periods of observation at Nummi. What they learned has been used in GM's new Saturn plant in Tennessee and piecemeal in older plants as well.

The Ford approach is more participatory. In the 1987 Ford/Mazda joint venture, Mazda operates the assembly plant in Michigan while Ford is reported to be a principal part supplier and to have received information from Mazda on quality control methods.

In the Ford/Nissan venture, which will start producing trucks in Ohio in 1991, Ford will operate the assembly plant but Nissan will provide the engines and the main body panel parts from its plant in Tennessee. One would expect that Nissan will also be quite generous with advice on assembly procedure. I hope so.

In U.S. industries where the two countries are competitive, it should be emphasized that the Japanese companies have only recently become fully competitive with U.S. companies. While older joint ventures in this industry which are still remaining—some of them have folded—and most of the newer ones seem based on trading complementary strengths.

But, the picture is mixed. Some do it better than others.

In Japan, Motorola and Toshiba formed a joint venture in 1987 to produce microprocessors, which is Motorola's strength, and memory chips, which Toshiba does better. This allowed Motorola to return to independent U.S. production of memory chips in 1988 using Toshiba's technology. Toshiba, no doubt, is exploiting what it has learned about microprocessors.

By contrast, two other joint ventures also in chips in Japan, logic chips in Japan in this case, one between Kobe Steel and Texas Instruments, who has been a long and quite successful producer in Japan, and one between Kawasaki Steel and LSI Logic. These would seem to give more technology and production knowhow to Japanese steel makers who are anxious to diversify into the chip industry than they do to the U.S. partners.

To take another happier example, in the United States, Komatsu recently formed a joint venture with Dresser Industries in construction machinery, another chapter in a long battle between Komatsu and Caterpillar. This may well give Dresser new insights into manufacturing methods which they can in turn use in other lines of business of theirs, industrial machinery and oil drilling equipment.

In conclusion, existing United States-Japan joint ventures provide as many, and probably more, learning opportunities to U.S. firms than to their Japanese partners. This is mainly due to the reluctance of U.S. aircraft producers, clearly world leaders, to enter

manufacturing joint ventures that would give Japanese companies the technology they have long sought.

But, in those industries where United States-Japan joint ventures are thriving, the gains to U.S. companies and to the U.S. depend on what is made of the opportunities that are there.

[The prepared statement of Dorothy B. Christelow follows:]

PREPARED STATEMENT OF MS. CHRISTELOW

I am delighted to be here today to summarize my contribution to *Japan's Economic Challenge* and some subsequent research.

Whoever chose the title for this collection may have had in mind Jean-Jacques Servan-Schreiber's 1967 bestseller, *The American Challenge,* about the direct investment "invasion" of Europe by U.S. multinationals then in full swing. He proposed that European businesses and governments study the elements of the U.S. success and meet the invasion by doing some of the same. Almost as an afterthought, he noted that the Japanese were also encountering an American challenge and seemed to be learning faster, as indeed they were. So here we are, faced with a Japanese challenge.

One of Japan's learning tools was the United States-Japan joint venture. The Japanese Government greatly preferred that its industries buy new technology and production methods and that they develop independently. But manufacturing ventures with foreigners to obtain needed technology and skills—making such ventures appealing to foreigners by barring most wholly owned foreign direct investment in manufacturing. By the mid-1960's, United States firms Japanese manufacturing affiliates (excluding oil refineries) had assets of only $1.5 billion, concentrated in chemicals, and industrial and business machines. Most were joint ventures which served as a conduit for a flow of technology from the United States to Japan.

By 1988, United States firms' Japanese manufacturing affiliates assets amounted to $60 billion, of which around 80% are still in joint ventures (although not required since 1974) and Japanese companies' United States manufacturing affiliate assets probably exceed $40 billion, about a third in joint ventures. This has caused some observers to worry that Japan is still using this method of acquiring technology to improve its competitive position relative to the United States.

My paper describes the special role of United States-Japan manufacturing joint ventures in expediting the flow of technology and production skills from one country to the other. It also concludes that this flow is probably now more strongly to than from the United States.

THE SPECIAL ROLE OF MANUFACTURING JOINT VENTURES

Direct investment in manufacturing involves the international transfer of financial and intangible assets, notably technology and production skills. This investment may be wholly owned by a single firm or a joint venture in which ownership is divided between a host-country firm and a foreign firm in some proportion that gives each partner a real voice in policy-making. One may also classify as joint venture a company in which a foreign firm has a major but noncontrolling interest. A good example is Isuzu, in which General Motors has held as much as 40%. The more closely the remaining shares are held—close holdings are more prevalent in Japan than the United States—the nearer the firm comes to being a prototypical joint venture.

Joint ventures tend to be more difficult and costly to manage than wholly owned investments, since differences in corporate cultures and objectives must be accommodated. But sometimes they also have advantages—for partners themselves or for their home countries.

One advantage is the more certain and rapid diffusion of technology and production skills in the receiving country. A wholly owned investment in manufacturing usually exploits the investing firm's strong position in world trade based on superior technology and production skills. The transfer of those intangible assets to the host country improves productivity there. But the welcome it receives depends on whether it drives domestic firms out of business, stifling domestic initiative, or whether demonstration effects and competition spur domestic firms to improve their productivity. Joint ventures in cases like this tend to assure this second outcome. However, since the strong foreign firm incurs extra costs and gives up some competitive advantage while the host country reaps large gains, joint ventures of this sort are not likely unless there are barriers, legal or otherwise, to wholly owned investment.

A second advantage of joint ventures is that they provide a way for firms that lack some of the financial and intangible assets required for success but have others to obtain the missing ingredients by trading what they have for what they need. In such cases, financial assets, technology and production skills do not necessarily all flow in the same direction.

THE FLOW OF TECHNOLOGY AND PRODUCTION SKILLS IN CURRENT UNITED STATES-JAPAN JOINT VENTURES

One indication of which way technology and productions skills may be flowing in current United States-Japan joint ventures is the distribution of those venture's assets among major industry groups ranked according to the two countries' relative strengths in world trade. The presumption is that if one country has a much stronger trade position in a given industry, joint ventures in that industry provide an opportunity for the partner based in the weaker country to acquire new technology and learn new production methods. If the trade strengths of the two countries are evenly matched in a given industry, it is likely that joint ventures in this industry are based on mutually complementary strengths, creating learning opportunities for both partners.

An update of table 3 from my article shows the results of such an exercise for those industries where roughly comparable trade and investment data were readily obtainable. The trade ranking of each country's industries is derived from the their performance in industrial country markets. The covers 80% of all United States-Japan joint manufacturing ventures.

We find substantially more joint venture assets in industries where Japan has a clearly stronger comparative advantage—principally automobiles and steel—than in industries where the United States is stronger—industrial chemicals and pharmaceuticals. But there is a large volume of joint ventures assets in industries where the two countries trade positions became more evenly matched in the 1980's.

Looking at this array of industries, we can see that the United States excels in the technology-intensive chemicals industries while Japan has moved to the fore in industries such as automobiles and steel, where it has combined acquired technology with creative and efficient mass production techniques and quality controls to produce a superior product. In those broad industries where the United States and Japan are more closely competitive, one finds subindustries, say semiconductors, where the same distinctions apply: the U.S. excels in high-tech microprocessors while Japan leads in mass-produced memory chips.

At a minimum, we would expect United States-Japan joint ventures to transfer a sample of the critical missing ingredient to the partner lacking it—for example how to make DuPont's "spandex" or "corian" or part ownership in an efficient automobile plant. But at best, joint ventures should also promote scientific research skills in Japan and more efficient production methods in the United States. The extent of this secondary dissemination has much to do with country benefits more from joint ventures.

SOME EXAMPLES

To see how joint ventures are in fact being used we look at a few examples, firs from *industries where the U.S. is stronger* and where Japan thus gains more from joint ventures.

In the *chemicals industries,* most joint ventures are in industrial chemicals, such as plastics, resins and fibers used in textiles, automobiles, packaging, building, and other industries. Most are in Japan and most were established in the 1980's, among old and new partners, roughly half of all the major U.S. and Japanese chemical companies. The U.S. firms readiness to enter joint ventures, despite their technology lead, is related to their customers' membership in keiretsu. (As you will remember from Dick Nanto's presentation, keiretsu are groups of firms centered on a lead bank or large manufacturing company. Members hold equity positions in and forge supply links with one another.) The keiretsu link is presumably helpful in competing against other Japanese. U.S. and other strong foreign rivals. DuPont has seven joint ventures in industrial chemicals in seven product lines with seven Japanese companies belonging to four different keiretsu.

In *pharmaceuticals,* where the Japanese market consists of doctors and hospitals (who dispense all prescription drugs in Japan) rather than keiretsu members, the strongest U.S. players, Merck and Dow, have been retreating from their respective joint ventures by buying out their Japanese partners. But other joint ventures remain. For example Lederle (Japan), jointly owned by American Cyanamid and Takeda Chemical, which has developed new anti-inflammatory and anti-ulcer drugs;

and an Upjohn-Sumitomo chemicals joint venture which produces antibiotic hormones.

In all of these joint ventures in industrial chemicals and pharmaceuticals, Japanese companies gain new technology and, at least in some cases, research experience with their U.S. partners.

In industries where Japan is stronger and the U.S. should now gain, joint ventures are mainly in automobiles and steel.

In *automobiles,* joint ventures in Japan are mostly 1970's vintage: GM's investment in Isuzu and Chrysler's joint venture with Mitsubishi Heavy Industries in Mitsubishi Motors in 1970 and Ford's investment in Mazda in 1979. The two early ventures provided the U.S. parents with small cars, for sale under their own name plates in the U.S., at a time when the parent's own efforts to produce salable small cars had been disappointing. But I have found no evidence that in the 1970's either GM or Chrysler considered these ventures useful as role models for efficient production methods.

However, joint ventures in the United States, initiated in the 1980's when Japanese companies had made considerable further progress in production methods and quality controls, have been welcomed by U.S. companies as learning opportunities. Toyota and Nissan were probably motivated to include joint ventures in their U.S. investment plans by a desire to defuse anti-Japanese sentiment. U.S. auto companies have found various methods of learning from a joint venture.

The GM approach appears to have been based on close observation, followed by imitation. Their venture with Toyota, called "Nummi", which started to produce in 1984 in an old GM plant in California, is operated entirely by Toyota, drawing on parts supplied by their affiliated companies as well as GM parts suppliers. At least in the early years, GM is reported to have sent as many as 1,000 managers a year for brief periods of observation at Nummi. What they learned has been used in their new "Saturn" plant in Tennessee and in older GM plants as well.

The Ford approach has been more participatory. In 1987, it entered a joint venture with Mazda to produce Fords and Mazdas in Michigan. While Mazda on quality control methods. In 1988, Ford and Nissan announced a joint venture to produce Nissan and Ford trucks in Ohio, to start producing in 1991. In this case, Ford will operate the assembly plant, but Nissan will provide the engines and the main body panel parts, produced at its plant in Tennessee. One would also expect that Nissan will be generous with advice on assembly procedure.

In *steel,* Japan scored early trade successes, based on technology purchased in Europe and here, its own production skills and intensive research efforts. In the early 1980's, U.S. protective trade policies spurred Japanese companies to seek investment opportunities in the United States. After several failed attempts to buy existing plants, and possibly sensing some anti-Japanese sentiment, all major Japanese companies formed one or more joint ventures between 1984 and 1989. They financed new plant and equipment and introduced more efficient production methods, aiming to supply their old customers, the Japanese auto companies.

The success of the steel joint ventures in disseminating Japanese production skills to the U.S.-owned steel industry looks uneven. Nippon Kokan has increased its share in National steel and has an option to buy out its partner, Intergoup. Some think the USX might like to sell out to its partner, Kobe Steel, directing its attention to other industries. But Inland Steel, in its two ventures with Nippon Steel, and Armco in its venture with Kawasaki Steel show every sign of staying the course—improving productivity and learning new production methods. The two remaining major joint ventures, Sumitomo with LTV and Nisshin with Wheeling Pittsburg, have involved U.S. partners going through chapter 11 bankruptcy. But both U.S. companies seem determined to continue.

In *industries where the two countries are competitive* and technology and production expertise could flow both ways—industrial and business machinery and the higher-tech end of the electronics industry—Japanese companies have only recently became fully competitive with U.S. companies. While older joint ventures in these industries contributed to Japan's recent success, the old ones remaining and newer ones seem based on trading complementary strengths. These trades exist in great variety.

On sort is the joint venture between old warriors with new respect for one another's strengths. In Japan, Motorola and Toshiba formed a joint venture in 1987 to produce microprocessors (Motorola's strength) and memory chips (where Toshiba does better). This allowed Motorola to return to independent U.S. production of memory chips, using Toshiba technology, in 1988. Toshiba is no doubt exploiting its new access to microprocessor technology. IBM, which has long produced and prospered in Japan without joint ventures, has responded to rising competition by form-

ing joint ventures with customers in computer applications. But also, to learn more about Japanese production methods, it has joined with Toshiba to produce large liquid crystal displays.

Other joint ventures involve Japanese partners from a mature industry seeking to diversify into a new and growing industry through a joint venture with a U.S. company in that industry. Two new ventures in the production of logic chips in Japan are Kobe Steel's with Texas Instruments (long an important independent producer in Japan) and Kawasaki Steel's venture with LSI Logic. There is some question as to whom these ventures will benefit, since Japanese steel companies do not bring any special chip production know-how to these ventures

In a third variety, two giants in construction machinery, Caterpillar and Komatsu, are doing battle in one another's home countries through joint ventures with strong domestic companies. Caterpillar has a long-standing manufacturing joint venture with Mitsubishi Heavy Industries in Japan, and shortly after Komatsu started to manufacture in the United States in 1987, it formed a joint manufacturing venture with Dresser Industries. In the new venture, Dresser is likely to learn new manufacturing methods adaptable to its other lines of industrial machinery and oil drilling equipment. And intensified competition in the U.S. construction machinery might stimulate further industry-wide productivity gains.

CONCLUSION

In conclusion, existing United States-Japan joint ventures provide as many and probably more learning opportunities to U.S. firms than to their Japanese partners. This relatively new tilt is mainly due to the reluctance of U.S. companies in industries where the United States is clearly a world leader—most notably aircraft production—to enter manufacturing joint ventures which would give to Japanese companies the technology they have long sought. But in those industries where U.S.-Japan joint ventures are significant, gains to U.S. companies and to the United States depend on what is made of the opportunities that are there.

THE INDUSTRY DISTRIBUTION OF SELECTED U.S.-JAPAN MANUFACTURING JOINT VENTURES IN 1988

(Percent of joint venture affiliate assets)

Industry group and comparative trade advantage	U.S. companies' Japanese ventures [1]	Japanese companies' U.S. ventures [2]
Stronger U.S. comparative advantage	15.73	4.03
Chemicals		
Pharmaceuticals	0.62	2.21
Industrial and other chemicals	15.10	1.81
Broadly competitive	12.73	57.24
Machinery (except electrical)	[3] 8.49	.....
Office (including computers)	.....	30.76
Industrial (except metalworking)	.....	19.40
Electric and electronic equipment (except radio, TV, communications, and household equipment)	4.24	7.08
Stronger Japanese comparative advantage	71.53	38.61
Road motor vehicles and parts	68.99	13.38
Metalworking machinery	([4])	0.23
Primary metals, ferrous	([5])	20.13
Radio, TV and communication equipment	[6] 2.54	1.11
Electronic parts for autos, TV, etc	.....	[6] 3.84
Total of above industries	100.00	100.00
Memorandum		
Joint venture assets in above industries as a percent of total joint venture assets in manufacturing	82.2	80.0

[1] Non-majority-owned affiliates only.
[2] Estimate based on Department of Commerce and JEI data. See Appendix in author's contribution to "Japan's Economic Challenge".
[3] Estimate, based on total affiliate assets for 1988 and percentage in joint ventures in 1966.
[4] Not reported separately. Included in machinery (except electrical).
[5] Small or nil and not reported separately.
[6] Includes household electrical equipment.
Sources: U.S. Department of Commerce and Japan Economic Institute.

Representative HAMILTON. All right. Thank you very much. We will begin with questions.

I want to start on the whole matter of Japan's apparent superiority in the manufacturing sector and have you identify for me, if you would, what the factors are that makes Japan superior to the United States in manufacturing, if that's the case.

Just identify the factors for me.

Ms. CHRISTELOW. Can I start? Let me first respectfully disagree with you, Mr. Hamilton. I don't believe that it is quite that sweeping.

I think Japan excels in some manufacturing areas rather more than others. I think clearly in the industry which I just mentioned, the aircraft production, no one would dispute U.S. superiority. Similarly, in some of the other industries that I mentioned, like microprocessors, no one has yet disputed U.S. superiority.

I do think, however, that the Japanese have learned far better than we have efficient production methods, which is what you were, I am sure, thinking about when you said——

Representative HAMILTON. Just looking at overall now, not isolating particular industries, are the Japanese superior to the United States in manufacturing?

Ms. CHRISTELOW. I don't think one can make a sweeping statement like that.

Representative HAMILTON. You have to divide it industry by industry?

Ms. CHRISTELOW. They do far better in some than in others.

Representative HAMILTON. Do you all of you agree with that?

Mr. PROCASSINI. Yes.

Mr. SMITKA. Yes.

Representative HAMILTON. We are strong where?

Mr. SMITKA. I believe we are strongest in—or rather we are weakest in the assembly oriented industries which require coordinating a lot of different sorts of inputs, a lot of different sorts of materials, a lot of different sorts of technologies, a lot of different manufacturing processes. That shows up very strongly not only in the automotive industry but in consumer electronics and perhaps even in how you put together the assembly line for chip manufacturing where you have got to deal with a lot of different suppliers.

Representative HAMILTON. That's where we are weakest?

Mr. SMITKA. That is where we are weakest. We are probably strongest in general and process technologies and large systems technologies.

Representative HAMILTON. Wouldn't an aircraft be in the first category?

Ms. CHRISTELOW. No.

Representative HAMILTON. No?

Ms. CHRISTELOW. Well, I think if the Japanese—not knowing very much about the aircraft industry, but my strong impression is that if the Japanese had the basic technology that they would be off and away. They don't.

Mr. SMITKA. I think in the aircraft industry, you have got different sorts of quality and material constraints than you do in, for example, the automotive industry.

Mr. PROCASSINI. I would like to address that for semiconductors. One has to be very careful in separating manufacturing efficiency and the ability to spend very large amounts of capital that have embedded in them technology.

For example, in Japan, the cost and availability of capital is such that large facilities can be built to build dynamic RAMS. And, this is a very high volume commodity type product, whereby if you invest sufficiently and you go down the learning curve sufficiently and you will gain manufacturing efficiency and expertise.

But, that does not come merely by stating you are going to be in that business. So, frankly, I support the other two testimonies.

You must be careful about the industry. You must also separate process technology from assembly technology, and you must consider the degree which capital investment is required to make technological advances.

Representative HAMILTON. What's the difference between process and assembly here?

Mr. PROCASSINI. Well, in assembly you can take individually identifiable components and be able to put them together with nuts, bolts, glue, screws, string or whatever it takes. An automobile assembly line or a chip assembly line is of that character. You take a chip and you take identifiable wires and assemble them, and you have an identity called an assembly.

However, a process type industry generally uses such things as gases, liquids, chemicals, et cetera to perform a function which occurs under perhaps temperature and time relationships where you cannot easily identify what is taking place. Usually, the process industries are of a character that a great deal of basic research is continually going on and where the process is generally embedded in the equipment——

Representative HAMILTON. And, the U.S. is stronger in which of these two areas?

Mr. PROCASSINI. The U.S. tends to be stronger in process industries as far as electronics is concerned. For example, microprocessors and the types of processes required, we are very strong.

Representative HAMILTON. And, weaker in the assembly?

Mr. PROCASSINI. No. Weaker in the sense of high volume where assembly or processes are not as difficult or as varied.

Representative HAMILTON. If you talk—the title of all of this for us is the "Economic Challenge." Is Japan's economic challenge, is it in the manufacturing sector where we get the strongest Japanese economic challenge?

Mr. PROCASSINI. I think you have to go back one more step. And, the step you have to go back to, is their economic policies that target or direct resources into specific industries which aid Japan.

If you study Japan closely——

Representative HAMILTON. That's their industrial policy?

Mr. PROCASSINI. That's one of their strongest reasons for being where they are at. If you look at Japan, it's a two-tier economy. The targeted industries are extremely strong on a world wide basis. And, joint government and industry relationships make those industries strong.

Representative HAMILTON. Do you agree with that, Dr. Smitka?

Mr. SMITKA. I have a different view of the role of industrial policy. For example, the passenger car market had some support in the earlier years but is principally developed without a whole lot of support, without a lot of benefits from industrial policy. And, the same thing would be true of consumer electronics.

To return to your larger issue of manufacturing, I think if we look at the international arena, typically trade is dominated by manufactured products. So, that is what will stand out whenever we try to carry out an international comparison.

We have been talking mainly about technology, including management skills. Of course, that's not the only thing that contributes to competitiveness. We also have the cost of capital considerations that Mr. Procassini mentioned.

We also have to have a skilled labor force. There, I think there is no disputing that Japan is turning out better educated individuals at the moment than our own high school and secondary school systems.

We also have to look at wage rates, exchange rates and many other factors that intervene in competitiveness. So, I think we need to look at some of the underlying things such as capital markets, education, and demographics. And, some of these, in the medium run are turning against Japan.

Representative HAMILTON. How much do you all worry about the Japanese challenge?

Mr. PROCASSINI. We have worried about it since 1977 when the SIA was established on the basis that Japan's challenge was a very serious one.

Representative HAMILTON. Do you think we are winning or losing?

Mr. PROCASSINI. I think we are losing.

Representative HAMILTON. Badly?

Mr. PROCASSINI. I think we are losing badly.

Representative HAMILTON. Do you all agree with that? Dr. Christelow?

Ms. CHRISTELOW. No.

Representative HAMILTON. Why don't you agree with that?

Ms. CHRISTELOW. Well, because I have more confidence in the U.S. industry than that. Taking it as a whole, I am sure that we will lose some battles, but I'm not sure that we——

Representative HAMILTON. Are we winning?

Ms. CHRISTELOW. I think we are in a—I think we are in a struggle, a competitive struggle. But, I think most of us——

Representative HAMILTON. How would you describe where we stand in that competitive struggle?

Ms. CHRISTELOW. Struggling. But, I think——

[Laughter.]

Representative HAMILTON. Are we on top or are we on bottom?

Ms. CHRISTELOW. I think we are neither one nor the other. But, I think it's——

Representative HAMILTON. Are we winning or losing?

Ms. CHRISTELOW. I think it's very healthy.

Representative HAMILTON. What are the—I'm trying to get a sense from you of how you view this challenge. Are the trends with us or against us?

Ms. CHRISTELOW. If I were Ford Motor and were competing against Chrysler, I wouldn't—or if I were watching this, I wouldn't say that it's good for only one company to win and all the rest to disappear.

I think competition between companies, between countries, is very healthy.

Representative HAMILTON. I am trying to get a sense from you though of how you view this challenge and what the trends are.

I mean, is this something we ought not to be worried about or should we deeply worry about it?

Ms. CHRISTELOW. Oh, I think we should be worried in a constructive sense.

Representative HAMILTON. Are we winning or losing, gaining? What's happening here?

Ms. CHRISTELOW. May I point out, too, that we are talking about a challenge in manufacturing. But, at the moment, of all of U.S./Japan—of Japan's direct investment in the United States only possibly, of their assets, just direct investment assets, an affiliate asset in the U.S., only 15 percent——

Representative HAMILTON. You economists are pretty good with graphs. If you were graphing this challenge, how would you graph it?

Mr. SMITKA. Let me bring a different yardstick to this. And, I think winning and losing is perhaps not a productive way to phrase the issue.

Representative HAMILTON. What is a better way?

Mr. SMITKA. Whether we, as a nation, are increasing our productivity, maintaining income, maintaining employment. And, of course, in individual industries, if an individual industry that is subject to international trade falls behind, then that can become apparent.

So, here, if we look at the Japanese challenge, do we have particular industries that are suffering. And, of course, because those employ real people we ought not to ignore that.

On the other hand, is this getting us to change? Are we viewing it as a challenge or are we viewing this as somehow a win/lose situation where if we can just get rid of the competition we are okay?

Representative HAMILTON. Well, look, if you come into my world and deal with people and constituents and all and you ask them what worries them today other than the Persian Gulf, of course, right now, they worry about the Japanese economic power challenge. And, of course, for most of them they translate it in terms of jobs.

Are their concerns misplaced?

Mr. PROCASSINI. No. I think their concerns are not misplaced and I will tell you why. I will tell you the measures.

Take a look at the trade deficit. Take a look at the standard of living in the United States. Take a look at the industries where we are using world market share. Take a look at the financial resources that we have versus the financial resources they have.

And, we are losing. We are losing. Now, if you take newer industries—forget automotive, forget locomotive, let's talk about aircraft, let's talk about pharmaceuticals, let's talk about superconducting devices, let's talk about super computers. These are the things that are being targeted by Japan.

Those jobs, if we do not respond, if we do not respond to Japan on a worldwide basis, we will lose the jobs in those industries. And, very frankly, I don't see where we have the coordinated efforts and policies to make ourselves competitors in the world.

You can forget about thinking that this is some benign environment that we live in. This is a national and international competition. And, we win or lose. There are no draws.

Representative HAMILTON. Now, that's a very different point of view than you've expressed, Dr. Christelow, isn't it?

Ms. CHRISTELOW. Yes.

Representative HAMILTON. And, Dr. Smitka, I haven't figured out where you are yet? You are in the middle here.

Mr. SMITKA. I think in more senses than one. But, here, if you look at the automotive industry, it employs more workers than does semiconductors and computers combined. It's going to be here in the U.S. for the foreseeable future.

And, so I think we need to be concerned about these mainline industries as well.

Representative HAMILTON. Give me your sense of the big picture though, like Dr. Procassini just did.

Mr. SMITKA. Here I think we are starting to recover, both because we now have Japanese firms operating in the U.S. and that in itself increases our productivity, and because the Big Three and parts firms are now responding.

So, if I look at the auto industry, the short term has been very traumatic. But, as in my opening statement, I see the future as being bright in terms of output, in terms of productivity, in terms perhaps of even exports.

Representative HAMILTON. Let the record show that Dr. Procassini is frowning on that statement.

Mr. PROCASSINI. Absolutely.

[Laughter.]

As a matter of fact, the largest industry in the United States is electronics, not automobiles. We have 2.7 million people employed in electronics in the United States.

This is a critical industry, not only for economic prosperity but for national security. And, the dependence on foreign technology has a far more reaching impact than the economics.

The situation, as I see it, is one where the critical technologies, which will add to productivity, if they are attacked, if they are undermined, will not result in increased productivity. At the present rate, although we have a higher productivity level than Japan, their rate of improvement is so much faster they will probably exceed us in the 1990s.

So, I am very concerned from the productivity level which results in standard of living improvements as much as in anything else.

Representative HAMILTON. Let me turn to my colleague here, Mr. Scheuer.

Representative SCHEUER. Thank you, Mr. Chairman. What is encouraging about our competitive situation in an industry where the Japanese market penetration increases inexorably year after year after year by one, two or three percent? I think that trend has continued for several decades.

What is encouraging about our competitive situation—let's take the automobile industry—where an American consumer automobile magazine publishes a list of the 10 most valued cars by consumers based on reliability? Out of the 10 most popular cars, only one is an American car. Buick was fifth out of most of the others. Seven or eight of the 10 were Japanese, and I think BMW and maybe Audi, one or two European cars crept in.

But, of the 10 most valued cars, most appreciated cars by the user, Buick was the only one that made the list. Buick was fifth, and Buick had a massive advertising campaign, patting themselves on the back that one American car maker came into the ranks of the first 10.

What does that say for the future of the American automobile industry?

Ms. CHRISTELOW. We are coming up.

Mr. SMITKA. Well, more and more of these cars are being made in North America even if they are labeled or marked as Japanese. More of the parts going into them are being made in North America.

Representative SCHEUER. Well, let me ask——

Mr. SMITKA. That's one side. The second side is that the——

Representative Scheuer [continuing]. When a Japanese car—when the Japanese manufacture a car in Smyrna, Tennessee or any other United States plant, is it the usual practice for them to import the high tech parts from Japan or do they acquire those parts from the American parts industry?

My understanding was that they use Americans—they use America the way we or the other colonial powers used their colonial possession or raw materials for cheap labor, for the large parts of the car that didn't require skill, and that they would then bring in the high tech parts. And, it was my understanding that Japanese manufacturing facilities in this country relied upon the Japanese parts manufacturing community rather than the American parts manufacturing community.

That's a very important thing for us to know.

Mr. SMITKA. I think that varies a lot from company to company. It's also something that is changing for a couple of reasons.

One is that when you set up a new assembly plant, you can't immediately source thousands of different items. You want to do that in a measured way. And, of course, you concentrate initially on the things that are hardest to ship across the Pacific or the things where you face the severest cost differential.

Over the longer run though, I think the Japanese, with the appreciation of the yen after 1985, have found that they can't rely upon parts production within Japan if they are going to remain

competitive. And, as in the case of Honda, this is a critical market. Honda has more sales outside of Japan than within Japan. If they don't produce here, then they run the risk of being put out of business if exchange rates shift against them.

So, at least three of the Japanese firms are moving gradually to setting up full-fledged engineering operations here. And, if you go to Japanese language materials where they aren't speaking to a U.S. audience, they are telling their own journalists that they are intending to set up independent production operations in Europe, in North America and to maintain their own in Japan, just as GM and Ford did before World War II on. GM/Europe and Ford/Europe are essentially independent operations.

So, I see this trend over the long run in the auto industry. But I think we will always have more trade in parts and more trade in finished vehicles than was true 20 years ago.

So, it's a mixed picture. And, of course, it depends on which company you are working in, whether it looks good or not.

Representative SCHEUER. Mr. Procassini, I enjoyed your testimony. I enjoyed all of the testimony. It was very, very helpful.

You made three comments that caught my attention. You emphasized we ought to have more market access. That's not the first time that has been expressed to this Committee.

You emphasized that we ought to have stronger anti-dumping measures. That's not the first time that has been emphasized to this Committee.

You mentioned that we have a problem in capital aggregation in this country. And, that's not the first time that problem has been discussed before us.

You give us a formidably impressive chart. Your Figure 8, "Semiconductor Capital Spending," that's awesome, that the Japanese are spending at more than twice the rate that we are spending.

What do you have new to contribute to the dialog that we haven't heard before on these three issues—access, anti-dumping and capital aggregation?

Mr. PROCASSINI. OK.

Representative SCHEUER. And, let me just say as a subset of that question: Do we need a national economic policy or can we let market forces solve these matters?

Mr. PROCASSINI. OK. I mentioned two other things besides the three you mentioned that go beyond traditional American positions. And, I will also answer your question, you know, do we need a national economic policy.

First of all, the fourth thing I mentioned is a cooperative effort within industry and between industry and government. I think that one of the outcomes of the late 1980s has been a more favorable environment in which government and industry have discussed problems jointly.

I don't think the 1986 U.S.-Japan Semiconductor Trade Agreement could have occurred without that relationship between industry and government. And, I frankly think that that is something that, in addition to the three that are well known, has not been explored sufficiently.

I think that there needs to be more inter-government industry relationships in terms of discussion, counsel and direction than there has ever been, because this is what often beats us with regard to Europe or with regard to Japan or with regard to Singapore. So, that is the fourth point that I made.

The fifth point that I made——

Representative SCHEUER. Let me just footnote that fourth point. I could not agree with you more.

We have learned I think a bitter lesson over the last decade, that confrontation between government and industry is not the way we get results. We tried for well over a decade to get a Clean Air Act. And, industry dug its heels in. They had a couple of very articulate and powerful representatives on both sides of Capitol Hill, and they effectively stymied things.

I think that we have learned that in terms of energy efficiency, improving the cost effectiveness of our society as a user of energy, and any number of other things, that we have got to work with industry. We have got to harness the talent that is out there. No question about it, it's there.

There is talent in industry. There is talent in the universities. There is talent in government agencies. And, we've got to work together in a conciliatory partnership modality. We must abandon confrontation, because when we have confrontation between government and industry, industry, who can hire 350 dollars an hour lawyers to frustrate, stymie, delay, and confuse, will win. And, they've proven that.

So, I totally agree with you. We have to learn new modes of working together, cooperating together, sharing knowledge, and sharing experience to come out with a result that is good for our country.

I totally agree.

Mr. PROCASSINI. The fifth suggestion I made is the United States needs a technology policy. And, I will tell you what I mean by that.

If you were to take a look at our international competitors, they recognize that all industries are not equal. Some grow faster. Some are larger. Some employ people who make higher wages. Some industries will dominate an economy.

They take into account differences. They don't put potato chips in with silicon chips. And, they don't put them in wood chips in automobiles.

And, very frankly, technology policy, whether it's pharmaceuticals or electronics or what have you, I think is a very important element to be factored into our other government policies.

The question you asked me, do we need national economic policy, I think that anyone in this room could write a book on that subject. But, suffice it to say, if we were to take the means we have, the institutions we have, and things that are very dear to us as individuals and begin to take into account some countervailing forces to these other international forces, at least we can make some modest improvement on how we plan.

Whether you could have a national economic policy, I really couldn't answer that.

Representative SCHEUER. Thank you.

Representative HAMILTON. Dr. Smitka, I was interested in your comments about superior management in Japan. Was that comment limited to the automobile industry or is that just more widely an observation?

Mr. SMITKA. I think you would have to look at the area of management. When it comes to narrow technical skills, such as in finance, we clearly have a lot of ability there.

I think the Japanese have been much better at learning how to coordinate different functions or different specialties. And that's a fairly generic problem in management.

Representative HAMILTON. Is it your view generally that Japanese are better managers than Americans in industry?

Mr. SMITKA. At the individual level, no. In terms of their ability to fit things together within an organization, they are able to take the same group of people and get better output.

So, I think it's——

Representative HAMILTON. That's what you mean by superior management?

Mr. SMITKA. That's superior management. Management technology maybe rather than managers as individuals.

Representative HAMILTON. Now, why are they better than we are at that?

Mr. SMITKA. I think there are two areas here. One is that within Japan—and for some reasons that are historical and that we can't duplicate—there was less of a buildup of functional specialties. You don't have a lot of licenses. You don't have lawyers. You don't have accountants and various things. And, engineers typically were trained at a lower level.

On the other hand, when they got into firms they would be rotated across a number of functions even if they stayed within a functional specialty. So, an engineer would have—or at least some engineers in a department would have exposure to marketing, perhaps one person had even been in finance and people had sat in the style shop next to the artist.

And, when you come into this situation, it means that you can pull people together from different functions in a different way.

Representative HAMILTON. Do you think we are learning from the Japanese on these management skills?

Mr. SMITKA. I am not sure that we are yet. We have done a fairly good job of at least starting to see how production proper can be handled in a better fashion, things such as just-in-time scheduling or statistical process control for maintaining quality. That's a sort of low level technology, almost a skill.

I think in terms of management systems, we haven't done a lot of rethinking there yet.

Representative HAMILTON. Did I hear you say that Japanese labor in the automobile industry today is more expensive than American?

Mr. SMITKA. Yes. As far as I can calculate, that's true.

Representative HAMILTON. The Japanese auto worker is paid more than the American auto worker; is that what——

Mr. SMITKA. If you go across the industry as a whole. The UAW labor costs right now, I think Chrysler is at the high end at like

$33. I am not sure who is at the low end. I think that was $29. So, roughly around $30 dollars an hour.

If you go to the Japanese automotive firms, it might be on the order of $24 or $25 an hour, maybe a little bit more. But, it's very hard to compare because the structure of how you set pay is very different. You don't have a single number that lets you do that very readily.

Representative HAMILTON. But, in any event, they don't have a decisive advantage because of lower——

Mr. SMITKA. No. They don't have wage as an advantage. And, they probably have a slight disadvantage.

Representative HAMILTON. Is that true in other industries, or is that just true in the automobile industry?

Mr. SMITKA. More and more, for anything that requires intensive labor input, the Japanese are at a disadvantage.

So, if you look at low end products, sort of simple cassette recorders, things like that, the Japanese market is now increasingly fed by items manufactured in Southeast Asia, and not within Japan.

Representative HAMILTON. When you say that North America is going to be the low cost production base for the world in the early 1990s, what do you mean, "low cost production base?"

Mr. SMITKA. Low cost production base comes from a couple of things. One, I see the dollar not becoming strong again. That is a critical element here.

But I see American workers still of relatively high quality for at least the next decade, next century I think the education problems of the U.S. will——

Representative HAMILTON. We are going to be the low cost producers, is that it?

Mr. SMITKA. Yes. And steel will be competitive, manufacturing will be roughly as efficient as Japan, our labor costs will be lower. Capital costs are not nearly as critical in the auto industry as they would be in semiconductor. Yes, I see us as being the low cost producer.

Representative HAMILTON. Do you agree with that Dr. Procassini?

Mr. PROCASSINI. Yes, I do. I think capital costs are much more important to us than labor costs. For example, if you take R&D, which is Ph.Ds and higher salaried individuals, plus capital spending and add them together, they are 25 percent of the annual expenditure of our industry. Labor costs are relatively small.

Representative HAMILTON. We hear constantly about that. OK. I will yield here to Mr. Scheuer.

Representative SCHEUER. Just a brief question. If capital costs are as important as they are, and there is such a wide discrepancy, a discrepancy seemingly embedded in the cultural personality of the countries whereby Japanese individuals seem to say they clear 19 percent of GNP, against our saving of maybe 4.5 percent of GNP.

Looking again at your Figure No. 8, I think it was, do we need a national strategy, a national legislation, a national policy as agreed on by the Executive and Legislative Branch, to address the seeming conundrum of our inability to aggregate capital in anything like

the scale that the Japanese do with less than half of our population.

Is there something we can leave to market forces?

Mr. PROCASSINI. No, I think you have a whole body of tax law. You have a whole body of laws relating to policies in the finance area. I think certainly investment credits, R&D credits, anything of this type would certainly help, and they are within the body of law that we have in general if you make specific improvements or specific modifications.

Yes, that is number one.

Number two, if you were to try to say well, let's have a corollary to the Japan development bank, I doubt whether it would work, because what you have is an industry bank. We had an industry bank with S&L's right? How did that work out?

So, you have to be very, very careful.

The third one, of course, is to have the American ingenuity and innovation take hold in these administrative areas like capital, and say are there other ways of doing this, and I don't think we have gotten to the bottom of that yet.

But I certainly think that a financial expert should be called in to say look, if this is a major problem, it is a major problem, and we have tax laws that will help, the other countries have development banks, that is not something that works easily for us, what could work?

And I think that you are right on target. We need some innovative ideas as to how to relate our technology policy and our financial policy.

Representative SCHEUER. Thank you.

Representative HAMILTON. Ms. Christelow, I was picking up on your comment about the flow of technology as a result of these joint ventures, and your conclusion that the flow is probably toward the U.S. more strongly, is that correct?

Ms. CHRISTELOW. I said I thought the opportunities were there, given the industries that joint ventures are in. And I hope the flow is that way.

Representative HAMILTON. My paper describes a special role of U.S.-Japan manufacturing joint ventures in expediting the flow of technology and production skills from one country to the other. It concludes that this flow is probably now more strongly to than from the United States.

Ms. CHRISTELOW. Yes. But I did emphasize it depends a little bit on how much advantage each firm is taking of their opportunities.

Representative HAMILTON. In the high tech industries, what is the pattern there? Are we seeing now a flow of high tech coming back to the United States in these joint ventures?

Ms. CHRISTELOW. Well, I mentioned one which was in the—well, I mentioned several joint ventures in the semiconductor industry, which I think you would say particularly the Motorola/Toshiba venture is bringing—after all, Motorola departed from that field some years ago in the face of heavy Japanese competition.

With the help of new technology in this field, they have returned to production independently in the United States.

Representative HAMILTON. Again, I am trying to get a sense of the situation overall. Is the high technology that we hear so much

about that we invent and create and the Japanese take and use commercially more effectively, how is that technology flowing now?

Ms. CHRISTELOW. I mentioned one example.

Representative HAMILTON. Give me the overall trends here. I have got to get the big picture.

Ms. CHRISTELOW. Well, my feeling is that we don't so much need high technology from Japan, because we still are king pin in this particular field.

We need the different range of skills, which is more in the manufacturing skills, production skills than in high technology.

Representative HAMILTON. But the Japanese need the high technology, isn't that right?

Ms. CHRISTELOW. I beg your pardon?

Representative HAMILTON. The Japanese, from their standpoint, they need the high tech?

Ms. CHRISTELOW. That is right.

Representative HAMILTON. And is that flowing to them through these joint ventures?

Ms. CHRISTELOW. To some extent. One would hope that not as much as the manufacturing skills are flowing the other way.

Representative HAMILTON. Is that an area where you need legislation?

Ms. CHRISTELOW. You mean to forbid joint ventures?

Representative HAMILTON. No, stop it. Just stop it. Or slow it down?

Ms. CHRISTELOW. Well, there are certainly fields where one would not like to see technology transferred, such as aviation production and possibly also the high end of the semiconductor business.

Possibly it is up to—let me see. I think one of the great temptations for the holders of high technology in this country now is simply money, and this is essentially a basic problem which——

Representative HAMILTON. Do you think any government restrictions are necessary on the flow of high technology to Japan, U.S. government?

Ms. CHRISTELOW. I think in some fields it might be useful, yes.

Representative HAMILTON. Where?

Ms. CHRISTELOW. Well, the two that I mentioned. Certainly in aircraft production, and I am not sufficiently much of an expert in this.

Representative HAMILTON. How about the rest of you. Do you feel we ought to put some bar, U.S. government bar on the flow of technology to Japan?

Mr. SMITKA. I don't know enough of the high tech end to be able to state that. I think in the automotive case we would do better to do the opposite; to *encourage* joint ventures in the U. S.

Representative HAMILTON. Do you have any sense of that, Dr. Procassini?

Mr. PROCASSINI. Yes. I believe that critical technologies that are related to national security should not easily be transferred.

Representative HAMILTON. Well, what if they are not related to the national security?

Mr. PROCASSINI. If they are not, then I think the best thing that can be served is that the government not prohibit, but that the gov-

ernment aid in the education and in the knowledge, so that we do not have the kind of transfer we had take place in the 1970s, and let me tell you what I mean by that.

The joint ventures established in Japan with Americans were an enforced technology exchange in the 1970s. You could not do business in Japan unless you gave your Japanese partner the license and the knowledge to use your technology.

I believe that that is the kind of thing the United States government should have put a stop to in the 1970s.

Representative HAMILTON. Almost anything can be connected to the national security if you work at it a little bit.

Mr. PROCASSINI. Even just commercial, these were commercial endeavors, and I think that——

Representative HAMILTON. Who is going to make the judgment as to whether or not something is in the national security interest? I mean, is that kind of a Presidential decision, and if he decides something is in the national security interest, then we could move in and block it?

Mr. PROCASSINI. I think what we have to do is you go through the normal course of events, through the Department of Defense and then on up whatever path you need to take.

Representative HAMILTON. Well, we ought to have that power to block it?

Mr. PROCASSINI. Yes. Yes. For national security, I believe so. In commercial endeavors, I believe we should not be willing to put up with foreign policies that enforce technology transfers, because that is what happened to us in the 1960s and the 1970s with Japan.

Representative HAMILTON. I take it you believe that government intervention has been a very big factor in the success of Japan's semiconductor and automobile industry?

Mr. PROCASSINI. I believe that without the government taking action in that case, we could not have stopped the erosion of our market share in Japan.

Representative HAMILTON. Now, you are talking about what?

Mr. PROCASSINI. Semiconductors.

Representative HAMILTON. Automobiles?

Mr. PROCASSINI. I only know about the semiconductor agreement. And in that case, we have gone half way. The Japanese have willingly—not willingly, but—let's put it this way, unwillingly, but now systematically are beginning to respond, and now we are almost conditioning them to a new way of thinking that they didn't have before.

We could not have done that without the U.S. government's negotiation with the government of Japan, could not have been done.

Representative HAMILTON. Has the Japanese government been a key factor in the automobile success of the Japanese?

Mr. SMITKA. In the 1950s, from roughly 1955, before then foreign firms dominated the Japanese domestic market. By closing off their markets to trade, they allowed the domestic firms to survive.

However, there is a wide range of measures the Japanese government tried to impose upon the auto industry that the auto industry successfully resisted, and in general I don't believe the auto industry in Japan in the 1960s and 1970s was favored over and above other industries.

Representative HAMILTON. The two industries we are talking about here, the automobile industry and the semiconductor industries, they are both very important, I guess, in terms of both the Japanese and the U.S. economic base, aren't they? You are talking about really two key, two very key industries. That is correct, isn't it?

Mr. SMITKA. Yes.

Representative HAMILTON. I wanted to ask you some questions, Dr. Procassini, about SEMATECH. How is it doing?

Mr. PROCASSINI. It is doing very well.

Representative HAMILTON. You are encouraged by that?

Mr. PROCASSINI. Yes, absolutely. And we hope that we can continue this endeavor as long as possible until we have achieved the technological objectives and we are on target and we are on our milestone.

Representative HAMILTON. What does success for SEMATECH mean?

Mr. PROCASSINI. Success means the attainment of higher and higher levels of technology manufacturing, and it is measured in milestones, usually in terms of geometry, in speeds, and the kinds of things electronic components are measured by.

Representative HAMILTON. Now, is it going to translate for us into commercial success?

Mr. PROCASSINI. I believe so. It will translate itself first into semiconductor manufacturing equipment which will have embedded in it technology which will allow us to build devices that other people can't build, and that way I think it is a very important measure of supplying the industry with the tools it needs.

Representative HAMILTON. When do we get the payoff?

Mr. PROCASSINI. We are already beginning to get the payoff in the sense that some of these processes are now beginning to be transferred to the companies that have been involved in this process.

Representative HAMILTON. Now, SEMATECH is confined to semiconductor manufacturing. Could we have a SEMATECH in other industries?

Mr. PROCASSINI. I don't know of any corresponding endeavor.

Representative HAMILTON. Why is the semiconductor industry so important that you should have a government SEMATECH operation?

Mr. PROCASSINI. Well, as I indicated earlier, there is only two reasons for any activity in this area; either economic prosperity or national security.

We happen to be in a situation where both are involved. We have an industry that grows at roughly 15 to 20 percent per year, and our industry—without it, the entire electronics industry in the U.S. could not survive.

It requires components and it requires components from sources that are reliable. If you are in a commercial endeavor, and you were not allowed to get the latest components because they are made in Japan and they are not going to sell them to you because they are going to use them internally, then our computer industry and our electronics industry will be behind.

Representative HAMILTON. How are we doing in the development of the so-called dynamic random access memory chips?

Mr. PROCASSINI. Very interesting that you should ask that, because TI last week, I believe, or 2 weeks ago, Texas Instruments announced the 16 megabyte D rem for production before any of the Japanese.

Now, this is the first time that we have led in front in a generation in several years.

The other thing that happened with the semiconductor agreement, it encouraged companies like Motorola to get back in the business, as has already been mentioned. It encouraged increased investment by Texas Instruments and by Micron and others, so what we have now is a leveling in our loss of share market, which has occurred in the last year.

So, I think what will happen now is that we have a foundation on which we can secure a base for D rem production in the United States.

Representative HAMILTON. Now, the battle now is over the 64 megabyte, is it not?

Mr. PROCASSINI. Yes, there is some indication that there have been samples made in laboratories in various companies, but the 4 megabyte is just going into production now in terms of usage.

Representative HAMILTON. 64 is down the road. Way down the road?

Mr. PROCASSINI. Quite a ways.

Representative HAMILTON. How far down the road?

Mr. PROCASSINI. I would say 6 to 8 years, in terms of peak production.

Representative HAMILTON. Now, in that area, which I presume is kind of on the cutting edge of the industry, how are we doing versus the Japanese?

Mr. PROCASSINI. I think that a great deal depends on SEMATECH. A great deal depends on building the production equipment.

Representative HAMILTON. At this point in time, would you say the Japanese or the United States is leading in the development of the 64 Mega——

Mr. PROCASSINI. I can only go by press reports, of which there has been only one Japanese company, one company that has announced even samples, and that is Hitachi, which was about 6 months ago. It is a long ways from even sampling.

Representative HAMILTON. So, you can't really say at this point who is in the lead there?

Mr. PROCASSINI. No, that is right.

Representative HAMILTON. How about the whole area of super computers that we hear about, the Cray super computers and all. How are we doing in those areas, vis-a-vis the Japanese?

Mr. PROCASSINI. As you know, the Cray was involved in a market access issue with Japan. The computer industry, including super computers, although it does well in the commercial market in Japan, virtually does nothing with the government of Japan in terms of purchases.

We have parallel computing coming on stream which will be very fast computer architecture. So, I think we are well ahead. The

problem is, we cannot allow the Japanese to keep their own market protected.

We cannot allow them to say, "Well, you have a better super computer, but we are not going to buy it at any price." That we can't allow.

Representative HAMILTON. Let me see if I can get the right chart here. The one that shows the closed Japanese market. Your Figure No. 3.

Mr. PROCASSINI. Yes.

Representative HAMILTON. That situation is improving somewhat, is that it?

Mr. PROCASSINI. Yes. By looking at the next figure, Figure No. 4, you will see that since 1986, since the trade agreement, it increased from about 8.5 percent, to where it is up in the 13 percent area now.

So, it is improving, but not at the rate that we would have expected it to improve.

And the reason for that is that for 2 years Japan attempted to keep us at bay in terms of these improvements, and it has only been in the last 3 years of this agreement that some actual work has been done with them.

I must compliment some of the Japanese companies who have set a policy of purchasing 20 percent of their input from foreign firms.

Sony has announced this in the press, and Shuster has announced this, and other major Japanese companies such as NEC, are achieving that.

The problem is that the entire market though has not yet bought into the same program.

Representative HAMILTON. How do you achieve this pressure for access to the Japanese market, and as you put it in your statement, Dr. Smitka, you were talking about encouraging the Japanese, as I recall it one place in your statement, to do a number of things that we wanted them to do.

How do you achieve that? How do you encourage the Japanese to do the things you want done, and how do you get the access in the market that you want?

Mr. SMITKA. Well, we do have an ace up our sleeve of threats of various sorts of interference in the industry, and we need——

Representative HAMILTON. What are you talking about?

Mr. SMITKA. We can take and put up all sorts of regulatory barriers or other things that would hurt Japanese firms, or we can fool around with fleet mileage requirements. There are all sorts of ways to enact differential policies.

Representative HAMILTON. Do you think we should?

Mr. SMITKA. No, but as long as we have these aces up our sleeve, if we are good poker players, and I think our record is that we are reasonably good, then we can take and at least have some sort of bargaining tool that will make the Japanese listen to us.

Representative HAMILTON. When you say our record is reasonably good, what do you mean by that? That we are gradually getting more and more access to their markets?

Mr. SMITKA. Yes. I think if we look back in the 1950s, the Japanese markets were explicitly closed.

Representative HAMILTON. It sure is an agonizing process though, isn't it?

Mr. SMITKA. I agree.

Representative HAMILTON. Isn't there a better way?

Mr. SMITKA. Apparently not, no, unfortunately.

Representative HAMILTON. Do you have any suggestions on how you are going to get the access you are talking about, Dr. Procassini?

Mr. PROCASSINI. Our approach has not been to propose barriers to American trade as sort of a quid pro quo. We have not proposed that, and don't believe in it.

What we do believe——

Representative HAMILTON. Do you agree with that, Dr. Smitka?

Mr. SMITKA. Yes, we shouldn't be sitting there with legislation on the table and say, "or else." Because that can backfire and we can shoot ourselves in the foot.

Representative HAMILTON. Go ahead.

Mr. PROCASSINI. So, what has to take place is that the U.S. government has many interests. The Japanese government has many interests. It is obvious to the Japanese to understand that if an agreement can be reached with the U.S. government on improvement of access, that I think that we can achieve that through normal negotiations. But the difficult part is once the governments agree to that, it takes a great deal of hard work.

For example, we have had to establish with the various trade associations in Japan a number of task forces. A task force on consumer electronics. A task force on automotive electronics. A task force on telecommunications. And each of these takes a great many man-hours of work and time. We have had to increase our investment in facilities in Japan. We have had to make extraordinary efforts so that even if agreements are met, access is never guaranteed. You still have to work at it, and it takes, like anything else, a great deal of effort.

Representative HAMILTON. Is the Japanese market the most restrictive market in the world?

Mr. PROCASSINI. No. But if you were to combine its size with its restrictions, it probably has the worst effect and the most restricted small market in the world.

Representative HAMILTON. What really are the obstacles to U.S. penetration of the market?

Mr. PROCASSINI. The obstacles, basically, are the fact that the Japanese company view their overall strategy in a broader corporate sense than let's say an entrepreneurial set of American firms.

If you have a keiretsu——

Representative HAMILTON. And that corporate sense is to keep the Americans out?

Mr. PROCASSINI. Keep foreigners out.

Representative HAMILTON. Keep foreigners out.

Mr. PROCASSINI. It doesn't mean—if you watched CNN this morning, Japanese store owners are already complaining about—stores that carry foreign goods have decided to lengthen their hours.

Representative HAMILTON. How do you think we deal with that problem?

Mr. PROCASSINI. With great difficulty. I lived in Japan and worked in Japan from 1974 to 1977, and it is with a great deal of difficulty to change this kind of an attitude.

Representative HAMILTON. How about those strategic impediment talks. Did they do any good?

Mr. PROCASSINI. Not having been a party to them, I don't know, nor the measurements of them. I don't know.

Representative HAMILTON. Now, you were talking about their willingness to dump chips. Are you talking about dumping them here in the U.S.?

Mr. PROCASSINI. No, they can dump them anywhere.

Representative HAMILTON. Do they dump them here?

Mr. PROCASSINI. They have. In 1985——

Representative HAMILTON. Are they doing it now?

Mr. PROCASSINI. No. We have no evidence at this point. However, I should state that with the current slowdown in electronics industry, prices are coming very, very close to what we could consider cost.

So, it is not something—I would rather say it is in remission rather than it is cured.

Representative HAMILTON. Do we have problems on the European side? Are there a lot of barriers there?

Mr. PROCASSINI. No. With regard to dumping, the Europeans have the same attitude we do. They don't want to see dumping in Europe.

Representative HAMILTON. How about access to the European market?

Mr. PROCASSINI. We have had no problem with Europe up until now. As a matter of fact, American firms have about 50 percent of the European market.

However, with Europe 1992 coming along if, for example, we are forced to make investments in Europe, in order to sell in Europe that will only lead to the use of very scarce capital for a purpose that can't be justified in a worldwide basis, and we are very sensitive to that.

We are sensitive to local content rules, forced investment, or any of these types of measures that the Europeans might use to maintain their own industry.

Representative HAMILTON. Dr. Christelow, do you think this Motorola-Toshiba joint venture that you refer to in your testimony is kind of the wave of the future, or is that just an isolated incident?

Are we going to see a lot more of that kind of thing?

Ms. CHRISTELOW. Well, we have seen a number of them. Just to spare you too much detail, I didn't give you a lot of them.

Representative HAMILTON. So, it is happening quite a bit, is that right, and it is enabling American firms to get back into the manufacturing business. That was the effect of the Motorola——

Ms. CHRISTELOW. In this particular case, yes. Absolutely.

Representative HAMILTON. And it is happening in a number of other industries as well?

Ms. CHRISTELOW. Yes. One also finds it in computers. IBM, for example, has a new venture also with Toshiba to make large liquid crystal displays. I think that is because—in fact they stated they

are doing it because they want to understand better Japanese production technology on this particular item.

Representative HAMILTON. Do the Japanese have a large share of foreign investment in the U.S. semiconductor business?

Mr. PROCASSINI. No. They are typically still exporters. There is no more than 6 percent of their output that is produced outside of Japan, and that is only happening partially because of the trade situation, nor do they move their most advanced products into the U.S..

I would say that Japan is following a very carefully planned strategy as to the degree that they will invest outside the U.S.—or outside of Japan, excuse me,—in any high technology industry, and for a fact, when I meet with other Asian people, such as Taiwan or Hong Kong or Korea or Singapore, one of their major complaints is that Japan does not transfer technology anywhere.

Representative HAMILTON. How do you describe the overall health of the U.S. semiconductor business?

Mr. PROCASSINI. I would describe the United States semiconductor industry, in my opinion, as at a turning point.

If we will have achieved the slowdown of the Japanese increase in shared market, and I believe that is very possible within the next 2 to 3 years, then I think the health of the industry will be very good.

If, however, the Japanese or any country were to resort to the same policies and we did not react to them, then I would say we would be in deeper trouble.

Representative HAMILTON. Dr. Smitka, what do you think about the automobile industry in the U.S., and more specifically, is Chrysler going to make it?

Mr. SMITKA. I think it is a little bit better than an even bet at the moment. Chrysler had one problem in the mid-1980s: They slowed down product development. So, now they are very short on saleable vehicles. They will have some new cars coming out in 1992. If the current recession isn't very deep, then I think they will be able to pull out of it. But they have had——

Representative HAMILTON. Would you expect to see them merge with somebody, or make some kind of a major shift in organization in order to strengthen their position?

Mr. SMITKA. I think they would like to avoid that for a number of reasons. They were talking quite seriously with Fiat in Italy, for example.

Representative HAMILTON. Yes.

Mr. SMITKA. But I have a distinct impression that they came away from Fiat interested in the money, but rather horrified by what they saw of the management and production facilities and so on in Fiat.

Representative HAMILTON. What is the market share of the Japanese automobile industry today?

Mr. SMITKA. In the U.S.?

Representative HAMILTON. Yes.

Mr. SMITKA. I don't have exact numbers because of the cars sold with American labels, but I would say roughly 30 percent. That is passenger cars.

Representative HAMILTON. And rising?

Mr. SMITKA. Slowly, although not a very rapid change at the moment.

Representative HAMILTON. And would you expect that trend to continue so that the Japanese automobiles take more and more of the American market?

Mr. SMITKA. I think that depends above all on whether GM can get its act together.

Representative HAMILTON. And do you think they can?

Mr. SMITKA. I am not sure. I think GM is the slowest off the starting mark of the Big Three. And they are a huge organization, so they can have one part running well, and next door in bad shape. So, I am not sure there. A new chairman [Robert Stempel] is certainly taking very different directions than his predecessor.

Representative HAMILTON. I want to conclude here. Do you have any final statements that any of you would want to make for the benefit of the Committee?

[No response.]

Representative HAMILTON. Any closing statements, as the lawyers say?

Mr. PROCASSINI. I would like to say that I am very pleased that you have been able to collect all this information, and I hope that from it comes some useful recommendations for you.

Representative HAMILTON. Well, we appreciate your contribution to that. We were glad to have each one of you here. It has been a good session. Thank you very much, and the Committee stands adjourned.

(The Committee was adjourned at 11:45 a.m., Tuesday, December 4, 1990.)

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

MAPI Policy Review

1200 EIGHTEENTH STREET, N.W., WASHINGTON, D.C. 20036 • (202) 331-8430

PR-114 November 1990

WHY U.S. MANUFACTURERS ARE AT A COMPETITIVE DISADVANTAGE

A Comparison of the Cost of Capital, Investment, and Productivity in the United States and Japan

MAPI (Manufacturers' Alliance for Productivity and Innovation) promotes the technological and economic progress of the United States through studies and seminars on changing economic, legal, and regulatory conditions affecting industry.

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The author is grateful to Kenneth McLennan, President of MAPI, who provided considerable assistance in the development of this project and in the organization of the findings. In addition, the author is indebted for helpful comments from Wolfgang Bessler, Robert Boylan, Vladimir Catto, Robert Hawkins, and Joseph Morone. Masako Darrough provided considerable guidance on data sources and recent changes in the Japanese tax code; Dale Jorgenson provided very helpful insights and guidance to the literature. The author alone is responsible for the opinions expressed here and for any remaining errors.

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WHY U.S. MANUFACTURERS ARE AT A COMPETITIVE DISADVANTAGE

A Comparison of the Cost of Capital, Investment, and Productivity in the United States and Japan

Overview

As an organization that is deeply concerned about the long-run performance of the U.S. manufacturing sector, the Manufacturers' Alliance for Productivity and Innovation (MAPI) is pleased to present this analysis of the sources of the gap in both capital investment and manufacturing productivity growth between the United States and Japan. This overview is intended to provide business executives with a deeper understanding of the challenges faced by U.S. industry from foreign competition as well as of the deficiencies currently existing in U.S. policies toward capital investment.

This overview also summarizes the major findings in this review of its comparative analysis of capital costs, investment, and productivity in the United States and Japan. MAPI's recommendations for policies to improve the productivity performance of U.S. manufacturing complete this overview.

U.S. Industry's Response to Greater International Competition

The erosion of U.S. leadership in international markets has been a gradual process. In the 1970s, imports from the Japanese and others increased their penetration of our domestic markets for manufactures, and U.S. exporters encountered strong competition in third markets, even when the U.S. dollar was declining in value. By the end of the decade, the U.S. position of leadership was lost in many product lines in such industries as automobiles, steel, machine tools, and electrical and nonelectrical machinery. The situation deteriorated further during the first half of the 1980s as the dollar appreciated very substantially.

At the beginning of the 1980s, U.S. industry launched a forceful response to the competitive challenge as it worked to control costs of production and improve product quality. Work force reductions at both corporate offices and operational divisions were carried out and rates of compensation increases were slashed. The manufacturing sector was restructured as businesses adopted a strategy of reallocating labor and capital resources toward the industries and product lines in which the United States had a comparative advantage. These private sector actions were an important source of heightened growth in manufacturing productivity which occurred during the long economic expansion of the 1980s.

Despite industry's response to the competitive challenge, U.S. leadership continued to be challenged in domestic and overseas markets

for an increasing number of industrial products, even after the value of the U.S. dollar began its decline in 1985. Management decisions to lower production costs through trimming the work force, controlling compensation, and improving the quality of manufacturing processes are clearly necessary conditions to restore competitiveness to U.S. industry, but such actions are not enough. It also is critical that the government adopt fiscal policies which stimulate national saving and encourage business to make long-term investments in U.S. manufacturing plant and equipment.

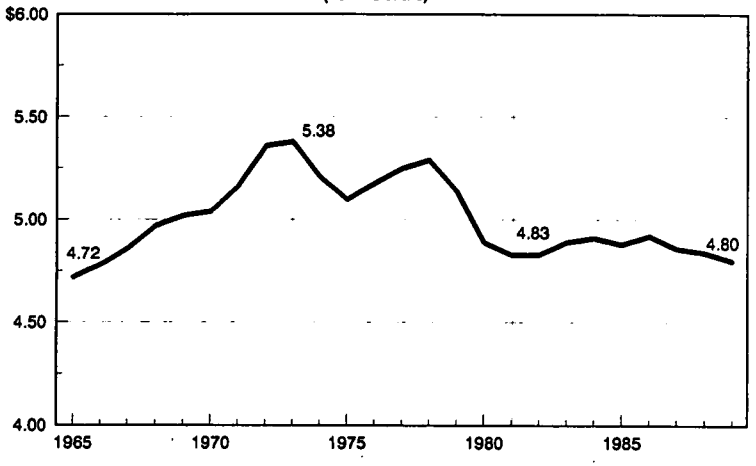
Government Fiscal and Social Policies
Retard U.S. Capital Investment

For the last 25 years, the United States has typically followed a fiscal-monetary policy mix which has done little to encourage long-term capital investment or strengthen the competitive position of U.S. industry. In the early 1970s, federal expenditures grew rapidly as a share of Gross National Product (GNP) as successive Administrations embraced social policies which required enriching existing entitlement programs and establishing new ones. These political decisions were popular both in the Congress and with the general populace, since the largest of these programs transferred resources to the elderly while payment was largely put off until this new system of entitlements "matured."

In the course of two decades, a veritable explosion in the number of eligible beneficiaries, combined with the ever-rising benefit levels, have made entitlement expenditures a growing proportion of federal expenditures. The cost of paying for these benefits that were promised 25 years ago falls heavily on today's working population. As shown in Chart 1 on the following page, average hourly earnings, after taking inflation into account, have been falling since 1973 and are currently at the same level as they were 25 years ago. Improvements in real earnings must come from robust growth in productivity and low rates of inflation. For example, during the period 1965-73, real earnings rose rapidly since productivity growth was strong and the rate of inflation was moderate. Payroll taxes to finance entitlement programs also were relatively low. After 1973, however, real earnings declined as productivity growth stagnated and inflation escalated. In the 1980s productivity growth improved and inflation moderated, but real hourly earnings remained flat.

In the 1970s and 1980s, the working population received little or no benefit from gains in productivity. Unfortunately, a substantial proportion of these gains was earmarked for financing entitlements for the nonworking population. For example, as a proportion of GNP, government expenditures rose from 17.6 percent in 1965 to 22.9 percent in 1989, despite a decline in defense spending from 8.3 to 6.1 percent of GNP over the period. The most rapidly growing source of revenue to finance increased expenditures came from social security taxes, which require the current generation of workers to finance most of the social security benefits of present and future retirees. These taxes now account for more than one-third of all federal revenue and are equivalent to 7 percent of GNP compared to 3.3 percent in 1965.

Chart 1
Real Average Hourly Earnings
1965 - 1989
(1977 Dollars)



Economic Report of the President, February 1990, Table C-44.

NOTE: The data series on real average hourly earnings relates to the following major groups in the work force: production workers in mining and manufacturing; construction workers in construction; nonsupervisory workers in transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. Average hourly earnings are on a "gross" basis and do not measure the level of total labor costs on the part of the employer since the following are excluded: irregular bonuses; retroactive items; payments of various welfare benefits; payroll taxes paid by employers; and earnings for those employees not covered under the production worker, construction worker, or nonsupervisory employee definition. If these excluded items were included, the resulting "total compensation" series would have shown an increase in real terms over the decade of the 1980s as the costs of benefits, particularly health insurance, have risen at rates substantially higher than the rate of inflation.

Throughout most of the period loose fiscal policies accelerated government expenditures, making it necessary for the Federal Reserve Board to follow tight monetary policies. Its actions pushed up interest rates, thereby increasing the cost of capital. In addition, the continuing large federal deficit reduced the rate of national saving and restricted the government's ability to provide industry with permanent incentives to invest in new plant and equipment. Without sufficient investment to increase the net stock of plant and equipment at a fairly rapid rate, the long-run productivity performance of U.S. industry will decline and future improvements in the standard of living of all groups will be affected adversely.

The "overconsumption-underinvestment" result of these ill-advised and ill-pursued fiscal policies stands in sharp contrast to Japanese macroeconomic policies. For the past three decades, Japan has generally followed a mix of tight fiscal and flexible monetary policies and a high capital investment strategy. As described in this report, this stratagem has enabled the Japanese government to follow policies which have kept the cost of capital low.

U.S. government policies which encouraged current consumption at the expense of long-run capital investment may not have been regarded as a drawback in the 1960s when U.S. manufacturers held a leadership position in most world markets. By the decade of the 1970s, however, manufacturers in other countries, such as Japan with its low cost of capital, were investing heavily in new manufacturing plant and equipment that incorporated the latest technological advances into the production process. The result was strong productivity performance, and it enabled countries with a high rate of capital investment to compete successfully with U.S. manufacturers.

A Comparative Review of U.S. and Japanese Policies Toward Capital Investment: Some Major Findings

The report which follows, prepared by Professor J. R. Norsworthy, Consultant to MAPI and Professor of Economics and Management Policy & Organization, Rensselaer Polytechnic Institute, examines the differences in productivity performance in United States and Japanese manufacturing. A major finding of this comparative analysis is that Japanese manufacturing companies have consistently enjoyed much lower costs of capital than their U.S. competitors. There are two key sources of this differential in favor of Japan: the availability of a large source of funds from employee savings programs; and access to low-cost capital from Japanese banks which own a substantial share, on average about 85 percent, of the liabilities in manufacturing companies.

Access to low-cost capital from the banking system encourages long-term investment in the development of new technologies. In addition, as Norsworthy states, since "Japanese manufacturers can sell above the world

price in their domestic market for a significant period of time, then they face a substantially smaller risk of not recovering R&D and early manufacturing costs."

This report points out that Japanese companies are able to maintain a much higher debt-to-asset ratio than U.S. companies and are able to make significant use of business interest expense as a way of reducing their tax liability. In addition to reviewing the literature on the cost of capital issue, the study presents empirical evidence identifying the difference in the costs of capital facing groups of U.S. and Japanese companies for the period 1965-81.

Much of the advantage enjoyed by Japanese manufacturers is attributed in the study to differences in the tax codes of the two countries. Norsworthy points out that this advantage continued even during the 1980s, despite major changes in tax policy in the United States. A critical advantage for Japanese manufacturers is that for at least two decades their government's fiscal policy has consistently encouraged investment in manufacturing plant and equipment through rapid depreciation of capital assets and an investment tax credit.

It is true that for a brief period in the early 1980s the United States adopted tax policies which encouraged capital investment. Unfortunately, the back-to-back recessions of 1982 and 1983, and the elimination of the investment tax credit in 1986, ended any hope of moving the U.S. rate of investment in manufacturing plant and equipment closer to the rate of investment by Japanese manufacturers. Norsworthy's estimate is that the cost of capital borne by U.S. manufacturers is about twice as high as the cost in Japan. The importance of the investment tax credit to high rates of capital investment also is supported by other research./1

This report points out that the current U.S. tax treatment of R&D expenses fails to take into account significant interest costs for high-technology products because of the large up-front investment and the long lag before payoff from the investment. Expensing R&D costs does not fully reflect the total cost of long product development cycles.

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1. For support of this view, see the following publications: John B. Shoven, "Alternative Tax Policies To Lower the U.S. Cost of Capital," in Business Taxes, Capital Costs & Competitiveness, American Council for Capital Formation Center for Policy Research, Washington, D.C., July 1990, pp. 1-23; Lawrence H. Summers, "The Impact of Tax Policy on Savings," The Consumption Tax: A Better Alternative?, eds., Charls E. Walker and Mark A. Bloomfield, Ballinger Publishing Company, 1987, pp. 172-177; and James M. Poterba, "Tax Policies for Increasing Business Saving," The U.S. Savings Challenge, eds., Charls E. Walker, Mark A. Bloomfield, and Margo Thorning, Westview Press, 1990, pp. 244-260.

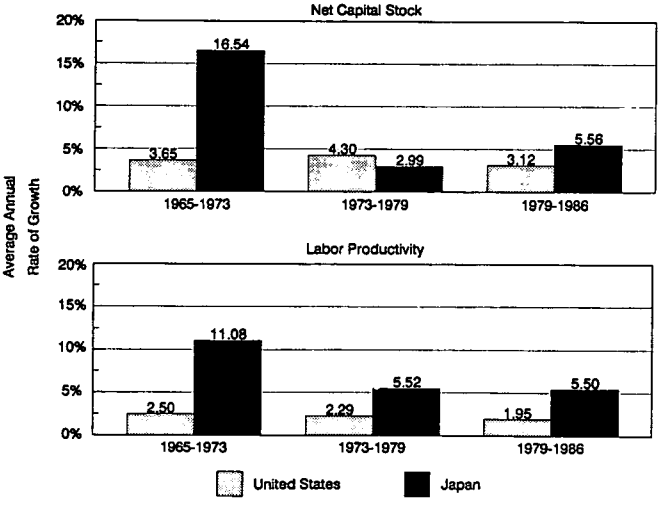
The study discusses why the huge U.S. trade deficit has taken such a long time to decline. As reported in the study, those countries with a chronic trade surplus with the United States (Japan, Taiwan, and South Korea) used the surplus to maintain manufacturing jobs in their domestic economies and, in particular, Japan invested proceeds from trade in U.S. capital markets which for many years have offered high rates of return.

The unique contribution of Norsworthy's review is that it demonstrates the link between investment and productivity growth. Chart 2 summarizes the implications of the different rates of capital investment for the United States and Japan. In the period 1965-73, Japan's average annual increase in the net stock of manufacturing capital was four times as great as the increase for the United States. Manufacturing productivity growth for Japan was extraordinarily high during this period and exceeded the growth in U.S. manufacturing by a significant margin. From 1973 to 1986 the gap in productivity narrowed, but Japan's rate averaged twice the rate for U.S. manufacturing.

Chart 2

United States and Japan:

Capital Investment and Productivity in Manufacturing



Source: Based on data from Table 3, page 21, of this report.

Even though the cost of capital in Japan has increased recently as its interest rates have risen, the study concludes that the U.S. government should consider a number of tax policy changes which reduce substantially the taxation of income from capital. In addition, Professor Norsworthy advocates larger federal expenditures for research and development and concludes by calling for "a very substantial reorientation of a wide range of policies toward science, technology, and investment applied consistently over time."

U.S. Industry Needs More Rapid Depreciation or an Investment Tax Credit

MAPI endorses Norsworthy's analysis of the problem facing U.S. industry and in general supports his recommendations for reducing the gap in capital costs between the United States and Japan. MAPI has called for a significant, and much more credible, reduction in the federal budget deficit than has been achieved by passage of the Omnibus Budget Reconciliation Act of 1990./2 Such a reduction is critical if national saving is to be increased and offers one of the most effective ways to reduce the cost of capital through lower interest rates.

MAPI also has presented specific proposals to reduce government expenditures, including moderating the growth of entitlements in a way which ensures that all groups, workers and nonworkers alike, share in the cost of foregoing current consumption in favor of investment so that all groups are able to consume more in the future.

It is likely that within the next several years further federal budget deficit reductions will be necessary. MAPI takes the position that this next round of deficit reduction must be achieved primarily through significant moderation in the growth of benefits in entitlement programs and reductions in outlays for other expenditure programs./3

Lagging investment in manufacturing plant and equipment is the most serious, long-run economic problem now facing the United States./4 For that

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2. The Impact of the Federal Budget on American Industry, MAPI Policy Review 113, November 1990.

3. The Day of Reckoning: Tax and Spending Policies for the 1990s, MAPI Policy Review 101, March 1988.

4. See Comments by Kenneth McLennan on John B. Shoven, "Alternative Tax Policies To Lower U.S. Cost of Capital," Business Taxes, Capital Costs & Competitiveness, American Council for Capital Formation Center for Policy Research, Washington, D.C., July 1990, pp. 41-47.

reason, MAPI advocates either the reintroduction of the investment tax credit (ITC) or more rapid depreciation of capital assets in order to stimulate U.S. capital investment to the rate of investment now enjoyed by U.S. manufacturers' major competitors. Provided federal expenditures are curtailed significantly and the incentives for investment in manufacturing plant and equipment are enacted, MAPI is prepared to support some form of tax on consumption to offset some of the revenue loss from the investment incentives.

If U.S. policy fails to stimulate investment and renders U.S. industry unable to match the productivity performance of Japan and a number of other industrialized countries, there is no question that U.S. industry will gradually become less competitive in world markets. The current trade deficit is only a symptom of this problem, and, as pointed out in this report, this deficit will not last forever. The U.S. productivity lag will eventually result in reducing on a more or less permanent basis the value of the U.S. dollar.

A long-term decline in the value of the dollar will eliminate the trade deficit and preserve world markets for U.S. manufacturers, but at a terrible cost to the economy and to all Americans. Under this scenario it will become more difficult to raise the U.S. standard of living. The economic conditions of some groups will deteriorate as the costs of imports escalate and low U.S. wages become the means of preserving a share of world markets for many U.S. manufactured goods. Finally, as more and more industries lose their competitive position, American workers will experience higher adjustment costs and lower wage levels than their counterparts in countries with superior productivity performance.

This report highlights the realities now facing U.S. policy officials. The problem of insufficient capital investment cannot be resolved without some initial sacrifice by all groups in society. It may be that no interest group is willing to make these sacrifices and perhaps politicians are unwilling to advocate policies that involve reducing current consumption. If that is the case, future generations of Americans will be unable to enjoy the economic and political benefits of a manufacturing sector which for almost half a century was second to none in world markets.

Kenneth McLennan
President
MAPI

WHY U.S. MANUFACTURERS ARE AT A COMPETITIVE DISADVANTAGE

A Comparison of the Cost of Capital, Investment, and Productivity in the United States and Japan

Introduction

The remarkable productivity performance of Japanese manufacturers during the past quarter century has raised significantly the Japanese standard of living. It also has made Japanese manufacturers leading world competitors. Productivity growth has enabled Japan's manufacturers to maintain relatively low unit costs of production and to become major competitors in the international market for many manufactured products, particularly those with high R&D content. While U.S. companies continue to hold leadership positions in the manufacture of a number of products, since 1965 Japanese competitors have gradually challenged U.S. leadership in most international markets.

What is the secret of the Japanese advantage in the productivity race? Many factors account for Japan's success. One important advantage, and perhaps it is the single most important advantage, is that the Japanese have been able and willing to devote enormous resources to investment in new manufacturing plant and equipment. High rates of Japanese national saving compared to the U.S. rate have proven an advantage and made it easier for Japan to devote a significantly higher proportion of its output to investment.

The decision by manufacturers to acquire new equipment incorporating the latest technology and/or to build more efficient plants is affected by the demand for the products produced by the plant and equipment. The rate of investment is significantly affected also, however, by the cost of capital. For example, if Japanese manufacturers face lower domestic credit costs than U.S. manufacturers and if capital income in Japan is taxed at rates lower than those in the United States, then clearly it will be difficult for U.S. manufacturers to match their Japanese competitors' rate of capital investment.

This report provides an overview of how the Japanese and United States tax codes affect the cost of capital. The effects of some of the institutional features of Japanese financial markets on the cost of financing capital investment in Japan are reviewed. The report also discusses the competitive implications of U.S. macroeconomic policies. Finally, on the basis of the comparative analysis, this report concludes that the lower cost of capital enjoyed by Japanese manufacturers offers a significant advantage strongly related to the investment and productivity performances of the manufacturing sectors in both countries.

The objective of this report is to survey the recent literature assessing the cost of capital in the United States and in Japan, to identify the sources of differences in capital costs, and to suggest measures that may reduce the gap between capital costs in the two countries.

Major Components of the Cost of Capital

A number of tax and market-determined factors affect the cost of capital in both the United States and Japan. The desired rate of return may be compared to a "hurdle rate" that is determined by the rate of return from investment in alternative assets. The cost of capital is the after-tax cost of investment in a particular type of productive asset: equipment, structures, inventory, etc. For the purpose of appraising competitiveness and technological advance, the most generally appropriate asset to examine is equipment. In the long run, the return on an asset must be high enough to cover all tax payments on income from the asset plus an after-tax return which encourages investors to continue to commit their funds./1

The following major types of tax policy provisions significantly affect the cost of capital: the rate at which the cost of plant and equipment can be written off as an expense; the tax treatment of capital gains and the definition of the base on which the gain is calculated; and investment tax credits and the corporate tax rates. In addition, tax policies of state and local governments (prefectures in Japan) and federal/state tax relationships also can affect the cost of capital.

Market-determined factors include economic depreciation (including obsolescence), the normal rate of return, and the debt-equity structure of the company. Tax policies obviously influence these market-determined factors. This report compares differences in how Japanese and U.S. policies treat these factors that have a direct impact on the relative cost of capital. A quantitative assessment of the cost of capital focuses on these direct factors. In addition, the report examines the role of interest rates and the practices of financial institutions as they affect the availability and cost of capital. Some indirect effects such as government economic policies toward trade, technology, saving, and the distribution of income also are discussed.

The various factors determining the cost of capital interact strongly. For example, the investment tax credit would be valueless in the absence of the corporate income tax, as would depreciation allowances. Thus, a comparison of the quantitative effects of tax provisions other than the corporate tax rate on the cost of capital depends on the level of the tax

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1. It should be noted that the cost of capital is not the cost of funds in the sense used in the finance literature--that is simply the interest rate. The cost of capital is defined in Jorgenson's terms (D. W. Jorgenson and Z. Griliches, "The Explanation of Productivity Change," Review of Economic Studies, 1967, pp. 229-282; L. R. Christensen and D. W. Jorgenson, "The Measurement of U.S. Real Capital Input, 1929-1967," Review of Income and Wealth, Vol. 15, pp. 293-320; and D. W. Jorgenson, "Capital as a Factor of Production," eds., D. W. Jorgenson and R. Landau, 1989, pp. 1-36) as elaborated in E. Biorn, Taxation, Technology and the User Cost of Capital, Contributions to Economic Analysis Series, North-Holland, 1989, and J. R. Norsworthy and S. L. Jang, Empirical Analysis of Technology and Productivity in High Technology and Service Industries, Contributions to Economic Analysis Series, Forthcoming, North-Holland, 1991, Ch. 3.

rate. Similarly, the tax provision that permits the deduction of interest on debt as a business expense strongly reduces the cost of debt financing compared to equity financing because there is a relatively high corporate tax rate in both the United States and Japan.

There is no simple answer to the question of which tax provision is the most important in determining the cost of capital. It is clear, however, that in the current U.S. tax system, reintroducing the investment tax credit and permitting more rapid depreciation both would directly encourage renewal of the capital stock. Taxing capital gains at a lower rate than regular income would stimulate business expansion generally and encourage investment through the effect on business cash flow. This indirect stimulus will obviously be much weaker than either the investment tax credit and more rapid depreciation. Reducing the corporate tax rate itself also increases cash flow, but it reduces the effects of tax provisions that work through tax deductions or credits.

Comparative Tax Policies and the Cost of Capital

Empirical Estimates of Corporate After-Tax Rates of Return, 1966-81

The rate of return on corporate assets after taxes, i.e., the rate necessary to attract investment, and other selected financial indicators are presented for two panels of U.S. and Japanese companies for the period 1966-81 in Tables 1 and 2. Table 1 shows that the after-tax return on capital for the U.S. companies was 5.0 percent, compared to 3.8 percent for Japanese companies. The relative variabilities among each group is similar, as the coefficients of variation confirm. This means that a large risk premium is an unlikely explanation for the higher average rate of return for the U.S. companies.

A major difference between the United States and Japan is the tax treatment of depreciation. There is considerable evidence that Japanese businesses routinely "write off" a higher proportion of their costs of plant and equipment as depreciation expenses than do U.S. businesses. For example, Tables 1 and 2 show much higher depreciation in Japan than in the United States. The unweighted average for the Japanese companies is 23.7 percent, while that for American companies is 15.6 percent, and there is less variation among the Japanese companies.

This difference in depreciation rates is a critical advantage for Japanese companies since it enables them to enjoy a relatively low cost of capital. It is reasonable to assume that economic depreciation is about the same for U.S. and Japanese firms in the competing industries. Consequently, the more rapid write-off of assets practiced in Japan results in higher cash flow, a higher return on investment, and greater capacity to invest in new capital goods. Further, while excess depreciation reduces both the measured profit and measured capital input, it imparts a downward bias to the measured rate of return necessary to induce the investment.

The depreciation rates in Japan may be viewed as the competitive norm for economic depreciation of assets. By this standard, the average age of plant and equipment of U.S. manufacturers will be older and less likely to incorporate the latest innovations which implies that the book value of corporate capital in the United States is likely to be too high.

Tax Policy Changes Since 1981

The empirical estimates for specific U.S. and Japanese companies presented in the previous section cover the period ending 1981. Unfortunately, there is no more recent study of comparable depth and quality. Both the United States and Japan have introduced significant tax changes since 1981. An important issue for this comparative analysis is whether these changes eliminated or reduced the Japanese advantage in the cost of capital.

Japan, which traditionally has had a very stable tax code, introduced several tax changes during the 1980s./2 These changes were as follows:

-- The maximum corporate rate was reduced somewhat, from 43.3 percent to 37.5 percent.

-- Some existing tax-exempt allowances and reserves (tax deferrals) were modified, but the effect on cost of capital was minimal.

-- Since 1988 tax-exempt interest income received by individuals is taxed at 20 percent instead of 9.9 percent. No change was made on the complete deductibility of interest income at the corporate level.

-- Capital gains, which were tax-exempt for individuals, are now taxed at a low rate.

-- The taxation of dividend income was modified, but dividend income continues to be treated more favorably under the Japanese tax code than in the U.S. code, i.e., the effect of double taxation of dividend income is lower in Japan.

-- In 1989 a new consumption tax was introduced. It was relatively broad in scope with only a light tax burden.

The most important feature of tax policy in Japan is, however, its stability. Those provisions of the Japanese tax code which act as a strong stimulus to investment in manufacturing--the investment tax credit and the several components of the relatively generous depreciation system--remained unchanged during the period of Japanese "tax reform." The policy of the

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2. The description of Japan's major tax policy changes is taken from Kazumasa Iwata and Atsushi Yoshida, "Capital Cost of Business Investment in Japan and the United States Under Tax Reform," in Japan and the World Economy, Vol. 2, No. 1, 1990, pp. 25-28.

Japanese government for decades has been not only to offer strong incentives for investment, but also to provide manufacturing businesses with the stable political and economic environment so essential to long-term investment decisions.

Prior to the 1980s, it was the conventional wisdom in the United States that major changes in tax policies were rare, because of the difficulty of arriving at a consensus among the conflicting interests within the political system. Over the past decade, conventional wisdom has changed dramatically. During this period three major tax bills were enacted, along with "revenue enhancers" which appeared almost annually as part of the federal budget process.

The effect of these changes on investment in the U.S. private business sector has produced great uncertainty, even though on balance taxation of business income is probably not higher now than it was in 1980. For manufacturing, however, the changes on balance have proved detrimental to the goal of increased investment in new plant and equipment. The impact of tax policy on capital investment in manufacturing fluctuated widely throughout the decade as it had since the introduction of the investment tax credit (ITC) in the early 1960s. The 1981 Economic Recovery Tax Act included a number of provisions favorable to investment in new plant and equipment and in research and development (R&D).

The 1981 Act provided for more rapid depreciation by establishing four classes of assets (the new Accelerated Cost Recovery System):

3-year property:	autos, light duty trucks, R&D equipment;
5-year property:	agricultural structures, pollution control equipment;
10-year property:	public utility property with ADR life of less than 25 years; and
15-year property:	property with ADR life of more than 25 years.

The Act also introduced the incremental R&D tax credit in the amount of 25 percent of specified expenditures over a base period (generally the preceding three years). And the Act extended the investment tax credit to the rehabilitation of industrial and commercial buildings and provided very favorable tax treatment for rehabilitation of historic buildings. The benefits of this extension of the ITC were not important to manufacturers, but represented a significant opportunity for the businesses in the commercial sector to lower their effective tax rates.

There were also a number of provisions in the 1981 Act which encouraged individual saving. These included an increase in the deduction limit for employer contributions to defined contribution pension plans and similar provisions for encouraging saving through employer-based pension and saving plans. The Act also permitted participants in employer plans to

establish individual retirement accounts in which individuals were able to invest up to $2,000 in pre-tax income for retirement purposes./3

The opportunity for using the incentives included in the 1981 tax act to stimulate investment was relatively short-lived. A year later, the Tax Equity and Fiscal Responsibility Act--the first of a series of "revenue raiser" tax bills--eroded the potential value of more rapid depreciation. Under the 1982 Act, the accelerations of capital cost recovery under the 1981 Act (scheduled to move from 150 percent to 175 percent declining-balance depreciation in 1985 and to 200 percent in 1986) were repealed. The ITC was modified slightly and changes were made in the completed-contract accounting method for long-term contracts, thereby reducing the value of these regulations for U.S. business./4

Finally, the Tax Reform Act of 1986 reduced direct investment incentives. The strong investment stimulus of the 1981 Act had reduced the effective tax rate for many businesses for about three tax years. But effective tax rates varied enormously among industries. For example, many companies in the insurance and banking industries had extremely low effective tax rates. A few manufacturers paid little corporate tax, but most had relatively high effective tax rates.

One of the goals of the 1986 Act was to make the tax code "more neutral" in the sense that the provisions of the code should not create large differences in effective tax rates and distort the flow of investment resources in favor of particular industries. There was clearly a strong case for reducing the large variation in taxes paid by different industries. To reduce distortions, the 1986 Act reduced the corporate rate, thereby lowering the value of exemptions, deductions, credits, and deferrals. At the same time, in order to offset the revenue loss from lowering individual tax rates, the investment tax credit was eliminated. For the manufacturing sector, the result was the loss of a major incentive to invest in new plant and equipment./5 In addition, the continuing uncertainty concerning the future of the incremental R&D tax credit reduces the effective incentive to greater investment in applied research by U.S. industry.

The full potential of the stimulus to capital investment envisaged by the Economic Recovery Tax Act of 1981 never materialized. Consistency in tax policy is a necessary condition for assessing the long-run return from capital investment. The decade of the 1980s produced a tax policy environment of great uncertainty and included repeal of the ITC, a powerful stimulant to

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3. For a complete review of the 1981 tax provisions, see Economic Recovery Tax Act of 1981, MAPI Bulletin 6187, August 31, 1981.

4. MAPI commented extensively on the Tax Equity and Fiscal Responsibility Act. See MAPI Bulletins 6238, January 29, 1982; 6246, March 1, 1982; 6252, March 23, 1982; 6281, July 7, 1982; 6286, July 26, 1982; 6295, August 19, 1982; 6307, September 21, 1982; and 6318, November 8, 1982.

5. MAPI again reported at great length on the Tax Reform Act of 1986, including Memorandums T-74, July 1986; T-76, October 1986; and Bulletins 6648, May 12, 1986; and 6657, June 10, 1986.

investment in new equipment and the adoption of new technologies. In assessing the tax changes that have occurred since 1981, this report concludes that Japan maintains its advantage of a tax code that lowers the cost of capital for manufacturing companies. Japanese manufacturing companies enjoy average capital recovery rates which exceed U.S. manufacturing companies' rates by a margin similar to the findings for the period 1966-1981 as shown in Tables 1 and 2.

Table 1

Selected Financial Ratios for Major U.S. Companies, 1966-1981
(Percent)

Company	After-Tax Return on Capital	Depreciation Rate	Ratio of Debt-to-Debt Plus Equity
AT&T	4.5	6.7	44.3
Chrysler	-2.5	14.0	51.4
Control Data	4.0	35.1	38.5
Delta Airlines	6.1	13.2	22.2
Digital Equipment	2.2	18.4	4.3
Dow Chemical	5.9	14.1	30.8
Eastman Kodak	4.8	12.8	1.1
Exxon	9.3	9.0	18.2
Ford	6.9	20.8	29.3
General Electric	6.7	15.9	13.3
General Motors	7.9	32.2	9.4
IBM	4.0	21.3	2.8
Macy's	9.1	8.3	32.1
Merck	3.6	9.7	3.7
National Semiconductor	3.7	31.1	9.9
Pfizer	4.1	10.7	15.0
Proctor & Gamble	4.7	6.8	6.5
Sears	3.4	8.7	31.1
US Steel	6.1	8.0	44.9
Mean*	5.0	15.6	21.5
Standard Deviation*	2.6	8.6	15.6
Coefficient of Variation*	0.52	0.55	0.73

* Computed by the author for the current study.

Source: A. Ando and A. Auerbach, "The Corporate Cost of Capital in Japan and the United States: A Comparison," in Government Policy Towards Industry in the United States and Japan, ed., J. B. Shoven, Cambridge University Press, 1988, pp. 21-50.

Table 2

Selected Financial Ratios for Major Japanese Companies, 1966-1981
(Percent)

Company	After-Tax Return on Capital	Depreciation Rate	Ratio of Debt-to-Debt Plus Equity
Fuji	6.1	24.4	28.2
Fujitsu	2.2	34.1	38.3
Kao	4.2	28.0	40.0
Kawasaki	3.5	13.2	73.0
Konishiroku	2.5	22.1	50.3
Lion	5.8	20.4	52.6
Mitsubishi	1.4	18.3	76.2
Mitsukoshi	5.9	15.9	9.8
National	8.4	44.0	11.0
NEC	1.5	34.6	52.4
Nippon Air	3.3	19.8	48.2
Nippon Steel	3.7	15.0	72.5
Nissan	4.3	30.3	48.5
Oki	1.1	30.2	54.8
Shionogi	6.2	20.2	30.5
Sony	2.9	20.1	15.0
Sumitom	2.1	19.8	67.3
Taisho	5.4	18.1	7.7
Takashimaya	4.5	13.5	54.2
Takeda	3.8	24.0	31.5
Toshiba	0.6	31.8	65.2
Mean*	3.8	23.7	44.2
Standard Deviation*	2.0	7.8	20.9
Coefficient of Variation*	0.52	0.33	0.47

* Computed by the author for the current study.

Source: A. Ando and A. Auerbach, "The Corporate Cost of Capital in Japan and the United States: A Comparison," in Government Policy Towards Industry in the United States and Japan, ed., J. B. Shoven, Cambridge University Press, 1988, pp. 21-50.

Capital gains or losses result from year-to-year changes in the price of capital assets of equivalent productive capacity. Even though unrealized, these capital gains or losses represent a real cost of doing business. There is no clear evidence for greater or lesser capital gains in these terms in either country; consequently, no conclusion regarding the comparative cost of capital can be drawn from capital gains or losses on assets. It is, however, important to recognize that capital gains are partially taxed in the United States but not in Japan.

In Japan there is an investment tax credit of 7 to 8 percent for equipment, depending on the industry and type of asset./6 At the present time, there is no investment tax credit for structures or equipment in the United States. From 1962 until the Tax Reform Act of 1986, the United States tax code allowed a tax credit for equipment, although the rate varied, and the tax credit was allowed to lapse from time to time. The surges in U.S. investment in 1972 and in the early 1980s followed reinstatement in 1971 and enhancements in 1981 for the ITC (along with faster depreciation in the latter instance), although the severe recession in the latter period reduced its full effect on capital investment. The credit was eliminated entirely in the 1986 tax act in part to offset the revenue loss caused by lowering individual and, to a lesser extent, corporate rates. The on-again, off-again treatment of the investment tax credit in the United States has undoubtedly reduced its effectiveness in encouraging investment, since it would be risky for corporate managers to depend on it as part of a long-term investment plan.

The tax treatment of interest on loans is a potentially important source of difference between the U.S. and Japanese tax codes. In both countries, debt service is treated as a cost of doing business, whereas dividends, the payments to holders of corporate equity, are taxed at the corporate profit rate.

The Ando-Auerbach study, "The Corporate Cost of Capital in Japan and the United States: A Comparison,"/7 finds substantially greater ratios of debt-to-debt plus equity (or total liabilities) for the panel of Japanese companies than for the panel of U.S. companies. As Tables 1 and 2 show, the ratio of debt-to-debt plus equity in the United States is less than half the value in Japan: 21.5 percent as against 44.2 percent for the 1966-81 period. Yet the dispersion of the ratio among companies is much higher in the United States than in Japan, as the coefficient of variation shows. Also, it is worth noting the three U.S. companies with the highest debt ratios. For two of them, Chrysler and U.S. Steel, their debt ratios were declining during most of the period. In the case of the third company, AT&T, the high debt-to-equity ratio can be explained by its public utility characteristics during the 1966-1981 period. During the 1980s, more substantial use was made of debt financing in the United States for leveraged buyouts which increased many major companies' debt-equity ratios.

In appraising the effects of the debt-equity financial structure of a company, it is important to distinguish between the act of raising capital by issuing debt or equity (a flow concept) and the level of the debt-equity ratio. For example, the debt-equity ratio in Japan fell in the latter part of the 1980s, but not primarily because of greater use of equity financing. Rather, the very rapid rise in the Japanese stock market has resulted in a substantial upward revaluation of equity.

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6. Ministry of Finance, An Outline of Japanese Taxes, Tokyo, 1988.

7. A. Ando and A. Auerbach, "The Corporate Cost of Capital in Japan and the United States: A Comparison," in Government Policy Towards Industry in the United States and Japan, ed., J. B. Shoven, Cambridge University Press, 1988, pp. 21-50.

The overall conclusion from the debt-equity data in Tables 1 and 2 is that a larger proportion of the gross return to capital goes for taxes in the United States than it does in Japan. This difference in the taxation of income from capital contributes significantly to the Japanese manufacturers' advantage of a much lower cost of capital over their U.S. competitors.

In a 1986 study entitled The Gap in the Cost of Capital: Causes, Effects and Remedies,/8 Hatsopoulos and Brooks estimate that the cost of capital has been two to three times higher in the United States than in Japan since the late 1970s. Also, as noted below, the marginal--i.e., market--cost of funds may be considerably higher than the average cost in Japan, whereas they are probably much closer in the United States. This factor is especially important because Japanese firms rely to a much greater extent than do U.S. firms on employee savings with the company and on other-than-market-rate financing of bank loans.

Saving Incentives and Access to Sources of Investment Finance

Numerous studies have been made on the differences between the practices of financial institutions in the United States and Japan. Much of the discussion of Japan's cultural influence on saving has focused on the Japanese propensity to save. Recent, more systematic studies point to strong institutional incentives and practices that encourage a high rate of saving.

Saving Incentives

In Japan, government fiscal policies and banking practices either encourage or permit a longer term perspective in corporate investment planning and practices. These include:

-- strong tax incentives to encourage personal saving;

-- ownership of corporate debt and equity by banks; and

-- control of Japanese saving by concentrated banking system in Japan.

There are several opportunities for tax-free saving in Japan. These include postal savings, "small savings tax exemption," interest on government bonds, and special savings accounts with the employer. Shoven and Tachibanaki found that ". . . an individual could have up to $14 million yen ($82,500) in nontaxable forms. If the household has several members, the amount of nontaxable savings can be increased accordingly. Moreover, there is

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8. G. N. Hatsopoulos and S. H. Brooks, The Gap in the Cost of Capital: Causes, Effects and Remedies, eds., R. Landau and D. W. Jorgenson, 1986, pp. 221-280.

widespread evidence of abuse of the system, with accounts being held in fictitious names."/9

Until recently capital gains were not taxed in Japan and are currently taxed at a low rate. After adjustment for inflation, Shoven and Tachibanaki found an effective overall tax rate of only 4.4 percent in 1980 (including all owners of corporate assets: households, tax-exempt institutions, insurance companies, and corporations themselves) on income from capital in Japan,/10 compared to 37.2 percent for the United States./11 For households alone, the effective rate in Japan was zero. More recent studies reach the conclusion that the cost of capital in Japan is about one-half what it is in the United States./12

High rates of saving also are important to the cost of capital. In Japan saving with the employer is considered an expression of employee loyalty to the company. While there is no direct evidence of the rates paid on these accounts, the very low rates paid on deposits with banks/13 (subject to income tax) suggest that the employer-paid rates (usually tax exempt) also are quite low. These circumstances obviously contribute to a low cost of capital available to Japanese corporations.

The structure of wage-and-salary payments also encourages saving: the employee of a major Japanese corporation may receive 15 to 20 percent of his or her annual wage in one or two bonus payments which makes saving easier.

Japanese Corporate Financing Practices Contribute to Lower Costs of Capital

The greater reliance by the Japanese on debt financing, as noted above, is another reason why their capital costs are lower than those in the United States. The principal form of corporate financing in Japan is debt, and the effective tax rate on debt financing in Japan in 1980 was negative 59.7 percent. The comparable figure for the United States in that same year was negative 16.3 percent./14

The major banks in Japan play a much larger role in directly supplying capital to Japanese corporations than their U.S. counterparts. As a result, a large proportion of Japanese corporate liabilities, about 85 percent, is owned by banks. While no comparable statistic is readily

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9. J. B. Shoven and T. Tachibanaki, "The Taxation of Income From Capital in Japan," ed., J. B. Shoven, 1988, pp. 51-96 at p. 58.

10. Op. cit., Table 3.17.

11. The U.S. figure was reported by King and Fullerton (1984) based on essentially the same methods and is cited by Shoven and Tachibanaki.

12. B. D. Bernheim and J. B. Shoven, "Taxation and the Cost of Capital: An International Comparison" in Charls E. Walker and Mark A. Bloomfield, eds., The Consumption Tax: A Better Alternative?, Cambridge, Mass.: Ballinger Publishing Company, 1987, pp. 61-86.

13. See Table 3 below and the accompanying discussion.

14. Shoven and Tachibanaki, op. cit., p. 72.

available for the United States, it is probably no more than 20 percent. Much of the Japanese corporate debt is short term, but it is typically rolled over with minimal difficulty, in part perhaps because the banks are more prominently represented on corporate boards of directors in Japan. Corporate debt obligations do not change ownership with the frequency that equity and debt obligations do in the United States. Thus, the planning horizon of the large Japanese enterprise can be longer, both because the cost of capital is lower and because the negative consequences of volatile ownership of the enterprise's obligations are less important.

Foreign access to capital markets is changing rapidly in all countries as world financial markets are increasingly integrated. Foreign investors, whether individuals or corporations, may freely buy or sell securities on U.S. securities exchanges, albeit under differential tax-withholding conditions on dividends.

Recently, some U.S. securities dealers have been permitted seats on the Tokyo exchange. Both Japan and the United States regulate rather stringently direct access of foreign firms to domestic sources of capital. In effect, however, Japanese corporations have far greater access to the lower cost capital from Japanese savers and investors. A large part of Japanese savings is controlled by corporations or banks. Because banking is much more concentrated in Japan than in the United States, the advantage of the low cost of capital enjoyed by Japan is likely to continue unless there are substantial changes in U.S. economic policy. Vladimir Catto, Chief Economist for Texas Instruments, concludes that the Japanese advantage in the cost of capital is likely to persist well into the next century./15

On the basis of this comparative overview of incentives and the unique institutional features of the Japanese banking system, this report concludes (a) despite changes in U.S. corporate tax rates in the 1980s, the incentives for saving and capital formation in Japan are much greater, and (b) in Japan much more reliance is placed on corporate debt than on equity financing, and this lowers the cost of capital. In addition, long-term relationships between banks and major corporations create a more stable environment for strategic corporate planning and investment, reinforcing the longer term investment perspectives encouraged by Japan's lower capital costs.

The Product Cycle, Investment, and the Rate of Return

The usual approach to appraising the capital requirements of an enterprise is simply to measure its total assets and to use this value as the base for determining the rate of return. This approach fails to deal with the interest costs that arise from the time lapse between the flow of revenues in return for the capital investment and the initial investment. Examination of the product cycle from R&D to discontinuance reveals aspects of the time

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15. V. Catto, "Cost of Capital," Texas Instruments Incorporated Internal Memorandum, August 1989, cited with permission.

structure of production that are commonly overlooked in the conventional economic model of production.

Interest Rate and the Cost of "Up-Front" Investments

Particularly in high-technology industries, production is preceded by extensive research and development, which may require the design, development, and manufacture of the capital equipment to include in the manufacturing process which delivers the final product. The early stage of developing, installing, and testing a new production process--or "riding the learning curve"--typically generates substantial costs that must be recovered in the prices charged for products that emerge from long production runs. The costs associated with the learning curve also include the cost of worker experience and training. This form of "human capital" is not financed by lower current wages, and consequently the separation in time between training expenditures and the subsequent payoffs from higher worker productivity also represent a form of "up-front" investment that must be compensated by future receipts. The magnitude of these costs of doing business depends on the cost of funds--the rate of interest.

Accounting practices permitted by the U.S. tax code do not satisfactorily allow for this aspect of the capital cost of production. Simply expensing R&D, training, and early manufacturing costs does not compensate for the interest cost incurred during the lag between the time expenses are incurred and the resulting receipts, because these costs must be financed either by borrowed funds--debt--or retained earnings--equity. To illustrate this problem, suppose that the costs for a particular product precede sales of the same product by one year. Then the price realized for that product must not only pay back the full cost of production, including a normal return on physical and financial capital required for current production, it also must reimburse the earlier expenditures with one-year's interest. For a new enterprise, losses must be carried forward to be offset against future gains, and, according to economic principles, the capital that finances the losses must earn a normal return./16 The tax laws, however, permit only the nominal value of the loss itself to be offset against future gains; the interest on the loss between the time it is incurred and eventually offset is not treated as a cost of doing business. Consequently, the tax laws themselves induce a bias against production processes that require significant time lags between initial investment and the realization of revenues from the investment.

Offsetting the costs associated with early investments is especially difficult in emerging or rapidly changing "high-tech" industries which require large "up-front" investments. For example, in the semiconductor industry where the cost of a new plant may be $300 million or more, only a very large firm can generate enough profits to overcome the cost resulting from the bias

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16. For an existing enterprise, losses may be carried back and offset against earlier profits. However, unless there is an above-normal rate of return in the recent history of the enterprise, part of normal operating costs will be taxed as though it were profit. It is doubtful that the tax laws in Japan or elsewhere allow for this problem.

in the tax laws. Highly integrated Japanese companies appear to have an advantage over their U.S. competitors. The forward-integrated Japanese semiconductor manufacturers are much more "survivable" than their typical, nonintegrated U.S. counterparts because the profits from computer manufacturing can compensate the "upstream" temporary losses in semiconductor manufactures. The large, diversified Japanese companies are able to use profits from their nonsemiconductor business to finance the gap between investment receipts. In addition, the short-term losses from the lag between expenditures and receipts can be used to reduce taxes from other profit centers in the company. Even if these lags were the same for U.S. and Japanese manufacturers, the higher interest costs in the United States put U.S. companies at a disadvantage.

Advantages of Shorter Product Cycles and Protected Domestic Markets

Recent evidence suggests that the overall product cycle is shorter for Japanese manufacturers than for U.S. manufacturers in the same industries./17 Some investigators argue that this shorter cycle is at least partly due to greater emphasis by the Japanese on incremental improvements in products and manufacturing processes./18

There is little doubt that competition has reduced the length of the product cycle for many products. Once on the market, a given product now enjoys a shorter period when it may be sold at a premium price; its R&D content is typically higher; and its total production run is typically shorter than was the case for comparable products, say, 15 years ago. Under these circumstances, even if U.S. and Japanese manufacturers are equally efficient in all aspects of product development and manufacture, the substantially lower cost of capital in Japan confers an advantage that is not captured in a conventional analysis.

The separation in time between R&D and other "up-front" costs and the receipts from product sales also increases the advantages that accrue to Japanese manufacturers from selling in a protected domestic market. If the world price prevails in the U.S. market, and Japanese manufacturers can sell above the world price in their domestic market for a significant period of time, then they face a substantially smaller risk of not recovering R&D and early manufacturing costs./19

It appears that because more industries depend increasingly on technological advances in their product development and manufacturing processes, the problem of the gap between investment and receipts now extends

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17. E. Mansfield, "Industrial R&D in Japan and the United States: A Comparative Study," American Economic Review, Vol. 78, No. 2, May 1988, pp. 223-228.

18. R. E. Gomory and R. W. Schmitt, "Science and Product," Science, May 1988, pp. 1131-1132, 1203-1204.

19. Norsworthy and Jang, op. cit., Ch. 8. Also see Joint United States-Japan Study Identifies Product Pricing as Key to "Structural Impediments" to Japanese Markets, MAPI Economic Report 153, November 20, 1989.

well beyond the semiconductor industry. Manufacturing in such industries as pharmaceuticals, computers, telecommunications equipment, and aircraft also seems to share this characteristic./20

In summary, the time structure of production favors Japanese producers over U.S. producers because capital costs are higher in the United States. This would be true even if the product cycle were the same in both countries. The problem facing U.S. manufacturers is probably magnified since the average Japanese manufacturer appears to be able to get its product to the market more rapidly.

International Financial and Macroeconomic Factors Affecting Capital Costs

During the last decade, many changes took place in Japan's participation in international capital markets. The largest banking houses in the world are now Japanese; in recent years investment abroad by Japanese corporations, banks, and individuals has increased enormously. These changes have had the effect of moving the market rates of interest in Japan toward the rates prevailing in Western Europe and the United States. The large U.S. federal budget and merchandise trade deficits and consequent higher real interest rates in the United States are generally believed to have attracted large quantities of investment funds from Japan and elsewhere./21

Some U.S. economic policymakers appear to view the merchandise trade deficit as a temporary phenomenon that eventually will be corrected by compensating movements in exchange rates. This view remains the conventional wisdom underlying the perception of international trade: it is believed that trade deficits cannot persist because exchange rates will adjust to eliminate them by forcing the currencies of the surplus countries to rise against those of the deficit countries. Together with the doctrine of comparative advantage, this analysis is at the core of international trade theory.

This textbook view of international trade assumes that only goods, currency, and short-term bank credit are involved in international transactions. It fails to take into account the effect of international flows of capital. When such flows occur, international trade surpluses and deficits can persist indefinitely as long as the country with the merchandise trade deficit is willing to make compensating capital transactions. This is exactly what has happened between the United States and Japan: the U.S. trade deficit has been financed by Japanese loans and purchases on capital account, encouraged by the widespread availability of virtually risk-free U.S.

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20. S. L. Jang, "Productivity Growth and Technological Change in the Semiconductor, Computer and Telecommunications Equipment Industries," Unpublished Doctoral Dissertation, Rensselaer Polytechnic Institute, 1987; and S. Sung and J. R. Norsworthy, "A Quantitative Analysis of Technological Change and Dual-Use of Technology: U.S. Aircraft Industry, 1961-1985," presented at the Eastern Economic Association Meeting, Baltimore, Maryland, March 1989.

21. B. M. Friedman, "Financing American Investment in New Technology," eds., Landau and Jorgenson, Ballinger Publishing Company, 1986, pp. 205-221.

government obligations created to finance the budget deficit. Other assets in the United States also have attracted Japanese (and European) investors, particularly urban real estate and agricultural land which are in comparative abundance in the United States.

The rising value of the U.S. dollar in international exchange from 1981 to late 1985 undoubtedly resulted from forces other than the adverse merchandise trade flows which by themselves would have reduced the value of the dollar in foreign exchange. The large inflows of capital to the United States acted to more than compensate for the trade flows and caused the dollar to rise. In 1982, the Council of Economic Advisers recognized the "twin deficits" problem,/22 but the Administration continued to expect the rapid rebound toward trade balance predicted by the "J-curve." The J-curve theory is based on the expectation that as the value of the dollar declines U.S. exports will expand and imports will fall off, thereby eliminating the trade deficit in a few quarters. By late 1985 the value of the U.S. dollar declined substantially and in 1987 the U.S. trade deficit improved as exports expanded. Nevertheless, reducing the U.S. trade deficit has proved more difficult than predicted and, as we enter the 1990s, the U.S. trade deficit remains at a substantial annual level and the compensating capital flows continue.

In purely logical terms, this pattern cannot go on forever. But it did persist through the 1980s when rising trade deficits were accompanied by large federal budget deficits and, for most of the decade, an anomalously (from the trade perspective) rising dollar. As Benjamin Friedman states, "The direct counterpart to these capital inflows to finance the U.S. federal budget deficit, therefore, is exactly the deterioration in U.S. net exports which has produced such widespread concern about American business competitiveness in recent years."/23

A brief examination of the incentives operating for Japan (and other countries with persistent trade surpluses with the United States, such as Taiwan and Korea, shows why this pattern has been especially attractive to these trading partners. First, the merchandise trade surplus maintains jobs in primary industries in the trade surplus country, particularly jobs in manufacturing. Second, relatively high real rates of return can be obtained by investing the proceeds from trade in U.S. capital markets. Third, physical assets in relatively short supply, particularly in Japan, can be purchased in the United States at real costs that are lower than those prevailing at home.

From the United States' perspective, manufacturing jobs are lost, but interest rates are lower than they otherwise would be, and American consumers enjoy foreign goods at prices lower than they could from domestic manufacturers. Further, the country could continue to defer the hard choices that would be required to reduce the federal budget deficit.

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22. R. McCulloch, "United States - Japan Economic Relations," Trade Policy Issues and Empirical Analysis, ed., R. E. Baldwin, National Bureau of Economic Research, University of Chicago Press, 1988, pp. 305-338.

23. Friedman, op. cit., p. 217.

The results of this analysis of the effects of international capital flows does not depend on protected domestic Japanese markets, manipulation of the terms of trade by central banks, one-way flows of technology, or other unfair trade and trade-related practices of which Japan is routinely accused./24 Even if Japan were to suddenly open all of its goods markets to foreign competition, the cost of capital to Japanese manufacturers would be lower than in the United States./25 The high real and nominal costs of capital in the United States have large, persistent adverse effects on the competitive position of U.S. business vis-a-vis Japanese manufacturers and will continue to do so even if the current trade issues between the United States and Japan are resolved.

Despite the recent advances U.S. manufacturers have made in product quality, Japan still appears to have the overall edge over the United States in many industries. One may speculate that this result is partially achieved through a two-stage process: greater substitution of capital for labor in those tasks where machinery can do the job, and greater use of labor in quality-related tasks where human input is harder to replace. Of course, higher product quality is generally associated with newer equipment and with better trained workers, both areas in which it is generally conceded that Japan continues to enjoy advantages. In large part, lower quality of manufactured goods is a price U.S. manufacturers and their customers have to pay for the higher cost of capital in the United States, which results from higher real and nominal interest rates sustained by the twin deficits in merchandise trade and the federal budget.

Recent Investment and Productivity Performances of U.S. and Japanese Manufacturers

The comparative investment and productivity performances of manufacturing in the United States and Japan are analyzed in three time periods: the period 1965-73 is generally regarded as the "golden era" of economic growth in the United States. For Japan it was a time of extraordinary productivity. In the second period, 1973-78, productivity performance weakened significantly in both countries. Finally, during 1978-1986, there was a slight improvement in productivity growth in both countries. Table 3 summarizes the comparative changes in output, capital, and labor inputs and productivity in both countries.

The major findings for 1965-73 are as follows:

-- For the United States, employment growth and capital investment (both of which determine output) increased at rates which were high by historical standards.

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24. Some such practices, which to some extent are real and persistent, have much more effect on particular industries than on the international macroeconomic and financial picture.

25. A Japanese perspective on these matters is given in S. Ishihara and A. Morita, "The Japan That Can Say 'No,'" Congressional Record, November 14, 1989, p. E3783.

-- Japan's rate of capital investment in manufacturing was especially strong during this period. This probably accounts for Japan's outstanding increase in manufacturing productivity during this period.

The major findings for the 1973-78 period are as follows:

-- A study comparing productivity growth and investment in Japan and the United States/26 found that investment slowed considerably in the 1973-78 period in both countries. Consequently, growth in labor productivity fell considerably as well. As Table 3 shows, however, manufacturing labor input fell rather sharply in Japan during that period, while it was just about flat in the United States. Most of the Japanese decline in labor input was in employment, rather than hours worked; the manufacturing labor force fell by about 10 percent in 1973-78.

-- During that period, the growth of capital input was lower in Japan than in the United States, but the capital/labor ratio rose more rapidly in Japan because labor input declined. Labor productivity consequently grew in Japan at 5.5 percent per year despite lower investment and output growth; total factor productivity rose faster in 1973-78 in Japan than it had in 1965-73, despite much slower growth in output and investment.

-- For both countries, the 1973-78 period was a difficult one, with high inflation and domestic recession. However, the adjustments made by the two countries were different--total factor productivity actually grew faster in Japan than in the earlier period, while it slowed down in the United States./27

The record for the 1978-86 period shows much more divergence between the two manufacturing sectors:

-- Japanese output, investment, and labor productivity grew significantly, with a small increase in employment in the domestic market. For the United States, inflation slowed and interest rates rose in real terms.

-- The gap between the United States and Japan widened as U.S. output growth and the rate of investment declined and labor productivity growth declined slightly. This occurred

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26. J. R. Norsworthy and D. H. Malmquist, "Input Measurement and Productivity Growth in Japanese and U.S. Manufacturing," American Economic Review, December 1983, Vol. 73, pp. 947-967.

27. If unmeasured product quality were taken into account, the Japanese output and productivity records would probably be further improved relative to the United States.

in spite of declining inflation and lower nominal interest rates in the United States and more favorable tax treatment of corporate investment in the 1981 tax act.

-- Real U.S. interest rates were probably rising for most of the period after 1982, however, and that coupled with low output growth undoubtedly reduced the incentive for investment.

In sum, recent trends in productivity (particularly labor productivity) and investment show that the Japanese performance continues strong compared to that of the United States. Output growth is not as rapid in Japan as it was prior to the 1973 downturn, but the gap is still large. More rapid net investment, even in the face of higher depreciation, is a major element of Japan's current success in manufacturing.

Table 3

Rates of Growth of Output, Productivity, and Inputs, Japanese and U.S. Manufacturing, 1965-1986
(Percent)

United States

	TFP*	Output	Labor	LPR**	Capital
1965-73	0.59	3.76	1.26	2.50	3.65
1973-78	0.43	2.53	0.24	2.29	4.30
1978-86	1.0	1.12	-0.82	1.95	3.12

Japan

	TFP*	Output	Labor	LPR**	Capital
1965-73	0.91	12.46	1.37	11.08	16.54
1973-78	1.64	2.99	-2.54	5.52	2.99
1978-86	1.0	6.38	0.88	5.50	5.56

* Total Factor Productivity (TFP) growth rates for 1978-86 are estimated from incomplete data.

** Labor Productivity (LP) (hours-paid basis).

Source: U.S. data for 1973-78 are from the Bureau of Labor Statistics, U.S. Department of Labor. Japanese data are from the Censuses of Manufacturers, 1978-86 and the Yearbook of Labor Statistics, 1978-86. Gross output (rather than value-added) is the basis for output measurement. All computation techniques are described in J. R. Norsworthy and D. H. Malmquist, "Input Measurement and Productivity Growth in Japanese and U.S. Manufacturing," American Economic Review, December 1983, Vol. 73, pp. 947-967.

Developments Since 1986

Recent productivity performance in manufacturing still favors Japan over the United States, although the massive investment gap of the late 1960s and early 1970s narrowed from 1973 to the mid-1980s. Nevertheless, the lower cost of capital and greater investment incentives in Japan, coupled with U.S. trade, tax, and fiscal policies, have caused the productivity and investment gaps to widen in recent years.

There is now considerable evidence that during the period 1986-88 Japan embarked upon another investment boom. For example, in 1988 Japan's gross fixed capital investment was $881.9 billion compared to $839 billion in the United States./28 This comparison is remarkable because the Japanese economy is only two-thirds the size of the U.S. economy. On a per-capita basis, Japan's gross investment is about twice the rate of investment in the United States.

These gross investment data include residential investment. In 1988 Japan invested about 11.7 percent of its gross domestic product (GDP) in machinery and equipment and 12.5 percent of GDP in nonresidential capital. The comparable proportions for the United States are 7.9 percent and 4.4 percent. Together these represent a proxy for business fixed investment. When these sectors are compared, Japan invested about $100 billion more in business fixed investment than the United States did in 1988./29 Unfortunately 1988 comparative data are not available for the manufacturing sector. There is every reason to believe, however, that the amount of Japanese capital investment in manufacturing also exceeds U.S. investment in this sector by a significant margin.

There is no evidence to suggest that there will be a significant narrowing of the gap in the cost of capital between Japan and the United States. Consequently, it is unlikely that the U.S. manufacturing sector will be able to match its competitors' rates of investment. On the contrary, different institutional structures and practices in banking and the more favorable fiscal and tax environment enjoyed by Japanese manufacturers are likely to extend the Japanese advantage well into the future. Joseph Morone and Albert Paulson, in a study of capital investment decisions in U.S. manufacturing, conclude that U.S. businesses can compete successfully against their Japanese counterparts only when they hold a technological advantage. The authors conclude that Japanese capital costs and resource management methods will ultimately win out in any direct competition./30

If the investment differential gap is to be narrowed, it will require specific actions by the U.S. government to reduce the cost of capital. Table 4 shows that the prime rate in Japan is still considerably lower than in the

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28. Organization for Economic Cooperation & Development, Historical Statistics, 1960-1988, OECD, Paris, 1990, Table B, p. 14.

29. Ibid., p. 14 and pp. 70-71.

30. J. Morone and A. Paulson, "Cost of Capital - The Managerial Perspective," Working Paper, School of Management, Rensselaer Polytechnic Institute, 1990.

United States and other competing countries. But the large gap between the Japanese deposit rate and those in other countries tells the tale: in real terms, the rate of return on deposits is less than 1 percent, about one-fourth the rate in the United States. Also, from mid-1989 to mid-1990, all currencies reported in The Economist's economic statistics series rose against the dollar except the yen./31 This pattern confirms a similar finding/32 that the U.S. exchange rate against the yen moved less than would have been predicted by movements in domestic price levels and relative productivity growth in several broadly defined manufacturing sectors. In each case, the likely explanation lies in capital flows that more than compensate for the merchandise trade flows.

The experience of the past 25 years and a partial snapshot of the current situation offer little comfort to those who expect the Japanese advantage in manufacturing to disappear of its own accord. Indeed, productivity in manufacturing continues to grow at a faster rate in Japan, and the best evidence suggests that after a quarter century of more rapid productivity growth the average level of Japanese manufacturing productivity is already higher in many industries there than in the United States. Unless the U.S. rate of capital investment is increased substantially, the adverse comparative trend in productivity levels will continue and U.S. industries will be at a significant competitive disadvantage in world markets.

Table 4

Lending, Deposit, and Real Interest Rates in Selected Industrialized Countries

	Prime Lending* Rate	Deposit Rate* (3 mos.)	CPI** (1 yr.)	Real Return on Deposits
France	10.50	10.06	3.0	7.06
West Germany	10.50	7.42	2.3	5.12
Holland	10.25	8.13	2.2	5.93
Italy	11.50	n/a	5.6	--
Japan	7.13	3.63	2.7	0.93
Sweden	14.00	12.65	10.2	3.45
United States	10.00	8.23	4.4	3.79

* Money and Interest Rates, p. 100.
** Prices and Wages, p. 99.

Source: The Economist, Table: "Trade, Exchange Rates and Reserves," July 7-13, 1990, pp. 99-100.

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31. Table: "Trade, Exchange Rates and Reserves," The Economist, July 7-13, 1990, p. 100.

32. J. R. Norsworthy, S. L. Jang, and H. A. Tsai, "Effects of Industry Productivity Change on Exchange Rates," Working Paper, School of Management, Rensselaer Polytechnic Institute, 1988.

An important insight to the Japanese success in encouraging capital formation lies in the structure of Japan's tax code. The combination of relatively high marginal rates for both personal and corporate income, and large and attractive exclusions for personal savings and corporate investment, produce a low net effective tax rate on income from investment. This structure increases the supply of savings to be invested and the rate of investment and renewal of the capital stock. This is the necessary foundation for rapid advances in manufacturing technology and productivity. Implicit in Japanese tax policy is a lack of concern for the neutrality of the tax system: the objective is to enhance capital spending and to reap its rewards.

In contrast, one of the significant advantages claimed for the U.S. tax code is its neutrality. In addition, the 1986 Act reduced or eliminated incentives to encourage saving and investment and, to a considerable extent, the existing consumption bias in the code was retained.

Since the United States' political system has such a large network of interest groups, each pursuing its own narrow interests, it is hard to visualize the United States adopting the Japanese approach. Acceptance of high marginal tax rates with incentives for saving and investment requires significant discipline to forego the immediate benefits of lower tax rates in exchange for implied future gains.

A Plan for Effecting Change

A set of policies to reduce significantly the cost of capital in the United States cannot credibly assume that somehow autonomous exchange rate adjustments will contribute significantly to a solution. Nor is it reasonable to expect that actions by the Japanese will help very much. The results of the recent negotiations in connection with the Structural Impediments Initiatives in which the Japanese agreed to open their domestic markets and encourage greater consumption are unlikely to have much effect.

Even if all Japanese markets for manufactured and agricultural goods were completely opened immediately, the effect on the merchandise trade balance would not be very large. Some U.S. industries, such as agriculture, would benefit noticeably, but others are unlikely to experience much growth in exports. For example, it is probably too late for the U.S. semiconductor industry to recover much of its lost share in Dynamic Random Access Memories (DRAMs), because the U.S. industry is not vertically integrated (except IBM) as in Japan, and the continuing capital requirements for R&D and plant and equipment are prohibitively expensive because the cost of capital to U.S. manufacturers is too high.

To reduce the U.S. cost of capital significantly would require a nearly balanced federal budget to reduce capital inflows and thus put downward pressure on domestic interest rates./33 Budget deficit closure has to be

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33. By increasing the national saving rate, a significant reduction in the federal budget deficit is likely to lower interest rates. It is, however, uncertain as to the extent to which rates may fall since foreign capital flows may continue for "safe haven" reasons.

financed by cuts in federal expenditures and by higher taxes on individual spending and/or consumption since higher corporate taxes would adversely affect the cost of capital. In addition, saving must be encouraged by far more favorable tax treatment in order to raise substantially the overall saving rate. Raising taxes on consumption and perhaps corporate profits, together with strong tax incentives to encourage personal saving and corporate investment, may succeed; no other strategy looks as promising.

If the federal budget is brought into balance and the social security system continues its surplus as now projected, federal debt held by the private sector can be reduced as the Social Security Trust Fund buys government bonds. Even under severe federal budget restrictions, the taxation of income from capital must be substantially reduced. Less restrictive IRAs and other tax-deferred accumulation plans can play a role; capital gains in a given year could be made tax-exempt up to a generous limit depending on the term of the investment, with full indexing. Depreciation allowances for equipment should be much more generous to encourage rapid renewal of the capital stock. Investment tax credits on equipment and plant investment should be restored. Expensing of interest should be allowed for tax purposes when receipts from a product lag the expenditures by more than, say, three or four months.

There are other direct roles that the federal government must also play in underwriting research and development and the diffusion and application of new technology. Encouraging basic research in universities and federal research laboratories is part of the government's role, but so must be offering incentives for diffusion of new technology and innovation. A recent report of the Office of Technology Assessment pointed out that the United States extended loans to small business of $1.3 billion and guaranteed loans of $4.3 billion in a recent year. The comparable figures for Japan were $29 billion and $56 billion, respectively./34

It is critical to understand that partial measures and inconsistent, on-again, off-again policies simply will not help very much. The stability of the economic environment and the incentives for saving and investment have contributed substantially to Japan's competitive success, even as instability in these areas has weakened the U.S. competitive position. In every way the objective of matching Japan's productivity growth is a long-run endeavor. A couple of years of strong productivity gains compared to some of our major competitors, as U.S. manufacturing has accomplished recently, is not sufficient./35 Competitiveness through higher productivity levels depends on the compounding effect over the long run. Thus, it is necessary not only to adopt efficient capital investment policies, but to pursue them consistently and, perhaps in the legislation itself, to enact provisions that discourage tinkering or repeal.

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34. "The Competition Industry," The Economist, July 7-13, 1990, pp. 29-30.

35. In fact, it is claimed that the official manufacturing productivity statistics which show such gains are biased upward in the GNP accounts. See L. Mishel, Manufacturing Numbers: How Inaccurate Statistics Conceal U.S. Industrial Decline, Economic Policy Institute, 1988.

For whatever reasons, the Japanese and Western European societies now appear to place a far greater value than does the United States on the application of technological innovation to manufacturing. These values are expressed in greater support for scientific and technological progress and education, and in more favorable treatment of income from investment, resulting in lower capital costs and higher investment rates. Much high-technology manufacturing is characterized by falling average costs of production and short product cycles, with larger fixed R&D and early manufacturing equipment design costs. In these circumstances, the combination of high capital costs and laissez-faire technology policies place comparative disadvantages on U.S. manufacturers. Those disadvantages can be reduced only by a very substantial reorientation of a wide range of policies toward science, technology, and investment applied consistently over time.

Manufacturers' Alliance for Productivity and Innovation
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MAPI is a policy research organization whose 500 member companies are drawn from the producers and users of capital goods and allied products. MAPI includes leading companies in heavy industry, automotive, chemicals, oil and gas, electronics, precision instruments, telecommunications, computers, office systems, aerospace, and similar high-technology industries. MAPI conducts original research in economics, law, and management and provides professional analysis of issues critical to the economic performance of the private sector. MAPI acts as national spokesman for policies which stimulate technological advancement and economic growth for the benefit of U.S. industry and the public interest.

The objectives of the Alliance as defined in the MAPI Constitution and which describe the MAPI program and its mission include:

- Promote and support the common interests of those engaged in manufacturing and related business services.
- Assist industry in improving its productivity by fostering capital investment and the development of product and process innovations, thereby enhancing its worldwide competitiveness.
- Conduct policy analyses, management studies, information exchange, conferences, and executive development programs designed to prepare industry for the future.
- Act in the public interest as a spokesman for policies that stimulate economic progress through capital formation, technological advancement, innovation, and productivity improvement.

PREPARED STATEMENT OF MANUFACTURERS' ALLIANCE FOR PRODUCTIVITY AND INNOVATION (MAPI)

The Manufacturers' Alliance for Productivity and Innovation (MAPI) today released a report that demonstrates the link between capital investment and industrial productivity growth and analyzes the sources of the gap in both factors between the United States and Japan since 1965. MAPI warns that "without sufficient investment to increase the net stock of plant and equipment at a fairly rapid rate, the long-run productivity performance of U.S. industry will decline and future improvements in the standard of living of all groups will be affected adversely."

Why U.S. Manufacturers Are at a Competitive Disadvantage: A Comparison of the Cost of Capital, Investment, and Productivity in the United States and Japan was prepared by John R. Norsworthy, Consultant to MAPI and Professor of Economics and Management Policy and Organization, Rensselaer Polytechnic Institute. Norsworthy says that the lower cost of capital enjoyed by Japanese manufacturers offers ". . . a significant advantage strongly related to the investment and productivity performances of the manufacturing sectors . . ." of Japan and the United States, and has allowed Japanese competitors to challenge U.S. leadership in international markets.

MAPI is not encouraged by "conventional wisdom" that says the current U.S. merchandise trade deficit is a temporary phenomenon that eventually will be corrected by compensating movements in exchange rates. While a long-term decline in the value of the dollar will eliminate the trade deficit and preserve world markets for U.S. manufacturers, MAPI believes that will occur ". . . at a terrible cost to the economy and to all Americans. . . ." since it will become increasingly difficult to raise the U.S. standard of living.

The report points out that although the Japanese economy is only two-thirds the size of the U.S. economy, in 1988, Japan's gross fixed capital investment was $881.9 billion compared to $839 billion in the United States. On a per capaita basis, Japan's gross investment is about twice the rate of U.S. investment. Among the factors affecting the cost of capital and rates of investment discussed in the report:

- a U.S. fiscal-monetary policy mix that has done little to encourage long-term capital investment or strengthen the competitive position of U.S. industry;
- a huge and growing U.S. federal deficit that crowds out other, more productive, uses of available money;
- burgeoning entitlement expenditures whose costs fall disproportionately on the U.S. working population, resulting in real average hourly wages falling to the level they were 25 years ago;
- the uncertainty and instability of the U.S. tax code (compared to Japanese tax policy) which have tended to discourage long-term U.S. investment in industrial plant and equipment;
- the ability of Japanese firms to write off a higher proportion of their costs of plant and equipment as depreciation expenses;
- elimination of the investment tax credit by the Tax Reform Act of 1986;
- strong tax incentives in Japan to encourage personal saving;
- ownership of Japanese corporate debt and equity by banks;
- the vertical integration of the Japanese industrial structure which allows corporations to finance modernization and innovation in one business with profits from another; and
- the ability of Japanese firms to recover more quickly R&D and early manufacturing costs by selling in their protected domestic market.

According to Norsworthy, reducing the U.S. cost of capital significantly would require a nearly balanced federal budget to reduce capital inflows and put downward pressure on domestic interest rates. Saving must be encouraged by more favorable tax treatment, including changes in depreciation allowances and restoration of the investment tax credit for industry and a variety of incentives for personal saving. In addition, the federal government should increase its role in spurring basic research and offering incentives for diffusion of new technology and innovation.

Copies of *Why U.S. Manufacturers Are at a Competitive Disadvantage* are available at $15 each for MAPI member company executives and $20 each for all other purchasers. Contact MAPI: 1200 Eighteenth Street, NW., Washington, DC 20036; 202-331-8430.

MAPI, the Manufacturers' Alliance for Productivity and Innovation, is a policy research organization with approximately 500 member companies including leading producers in heavy industry, automotive, electronics, precision instruments, telecommunications, computers, chemicals, oil and gas, aerospace, and other high-technology industries.

For additional information, contact Peggy Morrissette, 202-331-8430.

JAPAN'S ECONOMIC CHALLENGE

THURSDAY, DECEMBER 6, 1990

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Committee met at 1:05 p.m., pursuant to notice, in room 2261, Rayburn House Office Building, the Hon. Lee Hamilton, (Chairman of the Committee), presiding.

Present: Representatives Hamilton and Upton and Senator Bingaman.

Also present: Joe Minarik, Carl Derfeld, Richard Kaufman and Dorothy Robyn.

OPENING STATEMENT OF REPRESENTATIVE HAMILTON, CHAIRMAN

Representative HAMILTON. The Joint Economic Committee will come to order.

This afternoon we continue our hearings on the Japanese economic challenge. Today we look at issues concerning science and technology. Technology is the future, but for the first time some people have begun to question America's premier place in that future. We developed the computer, obtained the atom and explored the moon, but today we are losing one industry after another to foreign competition.

Now the Commerce Department recently developed 12 emerging technologies that will be critical to future economic prosperity and concluded that the United States was losing badly to Japan in 6, falling behind less seriously in 6, holding its own in 2 and leading in none.

Our interest is in understanding whether there is indeed a problem and, if so, how the United States should appropriately respond.

To help answer these questions we have with us today a knowledgeable panel of three specialists:

Martha Caldwell Harris, who is the Director of the Office of Japan Affairs at the National Research Council, the operating arm of the National Academies of Science and Engineering. She is one of the small group of Japan scholars in the United States. Her special expertise is Japan's science and technology policy. She is the author of, among other things, a chapter in the recently released Joint Economic Committee's volume on Japan's Economic Challenge.

William Finan is the president of Technecon Analytic Research, Inc. He has also served as Special Assistant to the Under Secretary of Commerce for International Trade and Director of Wharton

Econometric Forecasting Associates. He has degrees in both economics and engineering and has written extensively on international technology and trade issues with a special emphasis on the business practices of large Japanese electronic firms.

Kenneth Flamm is a Senior Fellow at the Brookings Institution, an economist by training and he has written about almost every facet of high technology, including a two volume study of the computer industry. He is completing a book on international trade in semiconductors which Brookings will publish this spring. His study of robots and industrial automation will be published in the fall of 1991.

So we have a very distinguished panel and an excellent topic, and we look forward to your comments.

Do any of my colleagues have a statement at this moment?

Senator BINGAMAN. I do not.

Representative UPTON. Yes, Mr. Chairman.

[The prepared statement of Representative Upton follows:]

PREPARED STATEMENT OF REPRESENTATIVE UPTON

This morning we focus on the vital issue of the Japanese challenge to the historic American leadership in technology.

Leadership in science and technology goes hand in hand with economic and industrial leadership.

There can be little doubt that Japan is a formidable competitor in many technological areas. Both U.S. industry and Government must respond to this challenge in a positive manner. The bottom line in the struggle for technological leadership is growth in productivity, real incomes and jobs.

I look forward to the testimony from our distinguished witnesses regarding what America must do to meet and best the Japanese challenge.

Representative HAMILTON. All right. We'll go ahead with the statements. Your statements of course will be entered into the record in full. We would appreciate if you would summarize those statements in a few minutes time so we will have plenty of time to question.

We will just go across the table beginning with you, Dr. Harris.

STATEMENT OF DR. MARTHA CALDWELL HARRIS, DIRECTOR, OFFICE OF JAPAN AFFAIRS, NATIONAL RESEARCH COUNCIL

Ms. HARRIS. Thank you, Mr. Chairman, for this opportunity to present testimony on the scientific and technological dimensions of the U.S.-Japan relationship.

I will touch on three topics.

First, I want to highlight some of the differences or asymmetries between the U.S. and Japan in science and technology that present both challenges and opportunities.

Second, I want to talk a little bit about the rapidly growing technology linkages between the U.S. and Japan.

Third, I will focus on some policy implications for the U.S.

Japan and U.S., both technological superpowers, present striking contrasts or asymmetries in the research and market systems of the two countries. While in theory these differences form the basis for new forms of technology sharing, they may very well also be the source of growing disparities in national economic well being.

First, regarding science, Japan's relative weakness in basic research where the U.S. is strong has been widely acknowledged by

the Japanese leaders. Japan has not established a large number of centers of basic research excellence, particularly in universities that draw the best talent from around the world as do ours.

Japan's weakness in scientific research can be traced to its university system. The share of expenditures on university research has declined as a part of the total national R&D effort, and university R&D has become more applications oriented in recent years. Their facilities and equipment simply don't compare to those in Japan's best corporate laboratories.

The status of science in Japan is more than an academic question. Thousands of Japanese researchers study in the United States, but only a handful of American researchers have worked in Japanese labs.

Another important contrast to the situation in the U.S. is the stress placed by Japanese public and private leaders on R&D useful to civilian industry. Japanese industry itself funds an unusually large percentage of total national R&D. Japanese companies expected to make up over half the list of the world's top ten R&D spenders this year have made aggressive investments in developing technology that will allow them to diversity into new fields in the future.

I recall a few years ago visiting with researchers at a major Japanese corporation doing work on superconductivity. What struck me was the steady and unbroken effort in low temperature superconductivity that company had maintained over the years when it was out of vogue elsewhere. This laid the foundation for work in the new field of high temperature superconductivity. The stress on applications was also striking.

I received from them a diagram of a high temperature superconductivity tree with anticipated product applications pictured at the end of every branch. From the earliest stages of research they were thinking about commercialization.

Industry today plays the starring role in Japan's advanced technology development, but the government is a strong supporting actor. There is no parallel in the U.S. to the Agency of Industrial Science and Technology Laboratories of MITI that have been established to enhance Japan's industrial strength, nor is there an organization quite like JETRO that has a comprehensive effort to monitor foreign technology development and to facilitate Japanese corporate participation abroad.

The fact that Japan still pays more for the technology it imports from the U.S. than it receives for such exports in terms of licenses and royalties reflects the emphasis laid on such activities.

Japan's growing investments in R&D reflect knowledge as a priority in national policy, corporate strategy and individual planning. Japan's educational institutions with the help of families produce an unusually technically literate high school graduating class and its universities also produce as many engineers as ours.

MITI is only one of a number of Japanese Government agencies involved in long-term planning, and one with a comparatively small budget. Working closely with private sector leaders, MITI has formulated long-term visions which outline changes in the industrial structure in line with trends in global markets. These vi-

sions provide a kind of road map, statements of goals and priorities for where they want to go in the future.

Japan's industrial visions have evolved over the years, and today one finds a growing emphasis on basic research, while at the same time emphasis on the importance of maintaining a strong manufacturing sector.

This emphasis on basic research I think reflects not only a desire to make a global contribution, but also the understanding that maintaining competitiveness will increasingly require independent expertise in more fundamental generic technology development.

Government officials also take on a role that is less common here. They act as venture capitalists to promote the development of technologies that are expected to produce commercial benefits. In most cases collaborative projects formed with government support last only a few years. The participating companies also continue their own parallel R&D efforts and turn quickly to independent competitive work when the research results promise commercial benefits.

What are the implications of these differences for the United States? If Japan creates centers of basic research excellence open to researchers from around the world, if engineers from around the world are able to tap into Japan's manufacturing base, and if Japan uses its financial and knowledge resources to help solve problems of global significance, then these asymmetries will be transformed into complimentary assets.

But if, on the other hand, the asymmetries result primarily in increasing the strain on U.S. research universities and preponderant flow of technology from the U.S. to Japan, then the result could be to create new disparities that weaken the U.S. economic and technological base.

I want to say a few words about technological linkages. These technological exchange linkages are nothing new, but the complexity of the interactions, their rapid increase and the difficulty of carrying out comprehensive inventories all add to the challenge of assessing the impacts.

The growth of Japan's foreign direct investment in the U.S., particularly in high technology firms, presents a new set of challenges. One form of investment that raises some concerns involves Japanese purchases of small high technology firms. The entrepreneurs that establish these companies are our nation's technical leaders working on the cutting edge. These companies are natural targets for foreign investors.

The problem is that such investments could endanger the technology base here in the U.S. under certain conditions leading to a net transfer of technology to Japan. Whether these investments and particularly outright acquisitions by Japanese companies will have a positive or negative effect remains to be seen.

To the extent that these investments are in advanced manufacturing technology, that they nurture technological expertise here in the U.S. and that they result in expanded exports from the U.S., they will be welcomed. To the extent that the effect is to limit employment opportunities here or to curtail U.S. base participation in the full range of research, manufacturing and market activities, the evaluation is likely to be more negative.

Another new trend in technology linkages is the expansion of Japanese corporate participation in the U.S. university research system. This takes many forms, everything from the growing numbers of Japanese students in our universities to endowed chairs, to the establishment of labs on American campuses.

Once again, it's too early to judge the long-term impacts. There is reason to welcome Japanese support for basic research here that has no strings attached, but at the same time academic leaders everywhere must work to ensure that the industrial contributions from any source do not endanger academic freedom.

Another kind of linkage is developing as U.S. companies establish R&D operations in Japan. Many of the largest and most successful of our companies believe that establishing a presence in Japan is a prerequisite for tapping into Japan's advanced manufacturing knowhow and for maintaining a significant share in Japan's market.

Some of Japan's largest companies, particularly its electronics firms are making room for researchers from America. U.S. industry and U.S. Government are investing more resources in programs of Japanese language training for technical personnel, but much remains to be done I think in this area to improve access to Japan's science and technology.

Another area of change in technological links is Japan's initiation of international R&D projects. Up until quite recently Japan was really more a follower than a leader. But today Japan is initiating new projects in areas like advanced manufacturing or IMS, and the discussions in Tokyo last month indicate that the groundwork has been laid to move ahead to a feasibility study for an international project.

When Japan takes the initiative in areas like this, U.S. industry and Government will have to invest considerable resources in responding. In view of the asymmetries noted earlier, it will be important to ensure that these projects yield concrete benefits to both sides.

Finally, let me make a few comments about policy implications. Looking ahead to the future, I think that U.S. firms will face a more complex and technologically based competitive challenge from Japan.

Rather than competition being focused on a few sectors, whether steel, semiconductors or automobiles, the two countries will be competing more deeply across the board from science to applied research to commercialization and marketing.

Japanese leaders are committed to building indigenous technological abilities that will help them to develop a wide range of industrial strengths. While some may conclude that the best response to this competitive challenge is for us to concentrate on building U.S. indigenous strengths, there are good reasons to question this kind of approach. The U.S. has the resources to support costly R&D investments, but it would be really difficult to maintain unequivocal leadership in every area.

Japan now has the technological and increasingly the scientific expertise and financial resources to contribute in new ways to addressing world problems and in development assistance. Japanese companies have developed manufacturing technologies that U.S.

engineers and business planners can learn from, and as global investment trends make it increasingly difficult to distinguish U.S. from foreign firms, a go-it-alone strategy would be really difficult to implement.

So what are the implications for the U.S.?

First, I would like to mention that Japan can contribute large-scale scientific programs of international cooperation, and Japan can also contribute through its technical assistance programs in developing countries. I won't go into any detail on those two issues.

Second, I think we should improve access to Japanese R&D, particularly advanced manufacturing knowhow. Participation by U.S. firms in cooperative research projects supported by the Japanese Government, although extensive, can help to deepen our understanding of how Japan's R&D system works and how Japan's technology policy is made.

Additional efforts on the part of Japanese Government and industry to expand opportunities for foreign researchers are needed, and if U.S. personnel are to learn from Japan's innovation process, firsthand experience in Japan and with Japanese counterparts will be a key.

Third, I think there is a need to examine joint ventures and other linkages between private sector organizations in our two countries. We should look for the results that can be measured in terms of impacts on the U.S. economy and technology base. Joint ventures and other Japanese-owned subsidiaries that transfer technology, develop new skills in our workforce, use locally produced components and expand exports should be welcomed.

We need to develop new mechanisms that permit the U.S. partners to learn and benefit from the innovation process in Japan. At this stage there is an urgent need to analyze these linkages as a basis for developing a more coherent long-term strategy for competing and cooperating with Japan. Better understanding of these linkages can help us to learn how they be made to work for both sides.

Even if these priority issues are addressed, however, significant problems will remain. The U.S. should not give up core industries, such as semiconductors, in the face of competition from Japan. When problems arise, they must be called out and candidly discussed with leaders from industry and academe as well as government.

The bottom line is that new efforts will be needed to ensure that the United States and Japan both remain leaders in science as well as technology. A division of labor that deepens U.S. excellence in basic research while perpetuating Japan's emphasis on commercialization of technology would be unacceptable.

Without concerted effort and leadership from both countries, the asymmetries that I discussed in science and technology may not be transformed into complementary assets. In order to avoid the negative consequences of that result, public and private leaders in our country will need to build an active strategy for competing and cooperating with Japan in advanced technology.

Representative HAMILTON. Thank you, Dr. Harris.

[The prepared statement of Dr. Harris follows:]

PREPARED STATEMENT OF DR. MARTHA CALDWELL HARRIS

Thank you, Mr. Chairman, for this opportunity to present testimony on scientific and technological relations between the United States and Japan. I speak today as an individual who has studied Japan's science and technology policy over the past 15 years, rather than as a spokesman for the National Research Council.

By way of introduction, I would like to mention that the Office of Japan Affairs which I direct acts as the staff for the National Research Council's Committee on Japan. The National Research Council, as you know, is the operating arm for the National Academies of Science and Engineering and the Institute of Medicine. Over the past two years under the chairmanship of Harold Brown, the Committee has been developing programs and reports to address new issues in U.S.-Japan science and technology relations. These efforts provide a resource to those in the U.S. policymaking community, public and private, who must deal with Japan as a technological superpower.

I would like to touch on three topics. First, I will highlight some of the differences or asymmetries between the United States and Japan in science and technology that present both challenges and opportunities. In setting this context, I will pay attention to a topic of special interest to the Joint Economic Committee—the roles of Japanese government and industry in the development and commercial application of new technologies. Second, I will discuss how rapidly growing technology linkages between the United States and Japan make up a new context for interaction and cooperation. Then I will focus on the policy implications for the United States of Japan's successful management of technological change and its contribution to that nation's growing competitiveness.

ASYMMETRIES OR POTENTIAL COMPLEMENTARITIES?

Japan and the United States are both technological superpowers, but they present striking contrasts in strengths and weaknesses, in the organizational context for generating new knowledge, and in the consequent impacts on global competition. These differences are asymmetries that reflect contrasts in the structures of the research and market systems of the two countries. While, in theory, these differences could be seen as forming the basis for new forms of technology sharing to mutual benefit, they may very well be the source of growing disparities in national economic wellbeing.

The Status of Science. In science and in basic research the contrasts between the United States and Japan are clearest. Japan's relative weakness in basic research—where the United States is strong—has been widely acknowledged by Japanese leaders. The point is not that Japan has no world-class scientists. The number of articles contributed by Japanese scientists to major international journals is growing (particularly in some fields like chemistry and physics), but remains small compared to the number published by scientists in the United States. The point is, rather, that Japan has not established a large number of centers of basic research excellence (particularly in universities) like those in the United States that act as a magnet drawing in the best talent from around the world.

Japan's current weaknesses in scientific research can be traced to its university system. Japanese universities are undergoing change, but they are still organized around the (chair) system that rewards seniority—sometimes at the expense of young talent. Japan's university research laboratories (especially facilities and equipment) simply do not compare with those in Japan's best corporate laboratories.

Many in Japan and abroad believe that Japan has underinvested in its university research system. The share of university expenditures on R&D has declined as a part of the total national R&D effort, and university R&D has become more applications-oriented in recent years. These problems relate to the fact that Japan's government expenditures on R&D make up a smaller share of GNP (.5 percent) in comparison to the 1.0 percent of GNP that government expenditures make up in most other advanced industrial countries.

The status of science in Japan is more than an "academic" question. As you know Mr. Chairman, scientists are part of a global community that thrives on the free exchange of research results. Thousands of Japanese scientists study in the United States, but only a handful of American researchers have worked in Japan's laboratories. There are a number of explanations, such as the Japanese language barrier, but a fundamental fact is that Japan's university system, which is the part most open and accessible to the rest of the world, has not established the breadth and depth of strength to attract the best researchers from the leading industrial nations.

R&D for Civilian Industry. Another important contrast to the situation in the United States is the stress laid by Japanese public and private leaders on R&D

useful to civilian industry. We should note that Japanese industry itself funds an unusually large percentage of total national R&D (about 80 percent). Japanese companies, expected to make up over half the list of the world's top ten R&D spenders in 1990, have well-equipped laboratories, and manufacturing companies employ more scientists and engineers per 10,000 employees than do U.S. manufacturing companies. Japanese corporations have made aggressive investments in accessing and developing technology a central hallmark of corporate strategy. The high value of the yen and the sound asset positions of Japan's largest corporations will permit them to use R&D to diversify into new fields while many U.S. corporations face severe constraints on R&D budgets.

I recall visiting a few years ago with corporate planners and research scientists at a major Japanese corporation involved in R&D on superconductivity. What struck me was the steady and unbroken effort in low temperature superconductivity that the company had maintained over the years when it was out of vogue elsewhere. This laid a foundation for work in the new field. The stress on applications was also striking. I received a diagram of a high temperature superconductivity "tree," with anticipated product applications pictured at the end of every branch. From the earliest stages of research, these corporate planners and researchers were thinking about commercialization. This is the norm rather than the exception in Japan.

If industry is today the driving force in Japan's advanced technology development, we should also note that the government is an important supporting actor. In years past, when Japanese industry was recovering from the war and much less competitive, the government played a strong role in brokering technology transfers and foreign investments and in planning the development of some industrial sectors. There is no parallel in the United States to the Agency of Industrial Science and Technology, organized by the Ministry of International Trade and Industry (MITI) to enhance Japan's industrial strength in market competition. Nor is there a U.S. organization like the Japan External Trade Organization (JETRO) that has established a comprehensive effort to monitor technology developments abroad and to facilitate Japanese corporate participation abroad. The fact that Japan still pays more for the technology it imports than it receives in licensing and other revenues for technology exports, another striking contrast to the United States, reflects the emphasis laid on such activities.

Japan's preoccupation with R&D useful to civilian industry must be understood in the historical context of the U.S.-Japan security treaty which provided a guarantee of military security. We find ourselves today, however, in a world where economic power is now recognized as increasingly critical to national security. Japan is uniquely positioned to develop and apply technologies to produce high quality components, increasingly incorporated into U.S. military systems.

Long-Range Planning. Japan's growing investments in R&D reflect "knowledge" as a priority in national policy, corporate strategy and individual planning. Japan's educational institutions, with the help of families, produce an unusually technically literate high school graduating class. This makes it possible for Japan's universities to produce as many engineers as U.S. universities. At a national level, Japan has set its goal on transforming itself into a "knowledge-based society" and to use science and technology to attain a new style of global leadership.

MITI is only one of a number of Japanese government agencies involved in long-term planning, one with a comparatively small budget. Working closely with private sector leaders through advisory committees, forums, and research associations, MITI has traditionally formulated long-term "visions" which outline desired changes in the industrial structure in line with anticipated trends in global markets. These macro-visions cannot be compared today to indicative planning in the European tradition of France, for example. However, they provide a road map for industrialists and leaders of Japan's research community—statements of goals and priorities for the decade ahead. While many reports are published in the United States, there are no precise equivalents to the MITI visions in providing guidance on desirable changes in industrial structure.

Japan's industrial visions have evolved over the years, and today one finds a growing emphasis on basic research. My own personal view is that this reflects not only a desire to make a global "contribution," but also an understanding that maintaining competitiveness will increasingly require independent expertise in more fundamental generic technology development. In fields like biotechnology and optoelectronics, where the lines between precompetitive and competitive research can shift quickly, scientific as well as technological strength will be critical to future success.

While a few years back Japan's visions highlighted shifts in industrial structure (from heavy industry to electronics, for example), today the emphasis is more on "technology fusion." The idea here is that the lines between industries have and

will become more blurred and that it will be more and more important to maintain world class R&D efforts in a number of fields. In addition to enlisting the expertise of industrial and academic leaders in formulating the "visions," government officials (particularly in MITI) also take on a role that is less common in the United States: they act as venture capitalists to promote the development of generic technology useful to industry technologies that are expected to produce commercial benefits "the day after tomorrow." The significance of government-supported R&D cooperation in Japan is as a catalyst and venture capitalist in seeding these more fundamental research efforts. In most cases, the collaborative projects formed with government support last only a few years and have clearly defined goals. Participating companies usually continue their own parallel R&D efforts and turn quickly to independent, competitive work when the research results promise commercial benefits.

There are many possible explanations for these characteristic Japanese approaches. Without attempting here to offer explanations, it should be noted that Japan's technology management approach (which involves both public and private organizations) contributes significantly to national competitiveness and economic well-being.

If Japan creates centers of basic research excellence open to researchers from around the world, if engineers from around the world are able to tap into Japan's manufacturing technology, if Japan uses its financial and knowledge resources to help solve problems of global significance, then the asymmetries outlined above will be transformed into complementary assets. If, on the other hand, the asymmetries result primarily in increasing the strain on U.S. research universities, and a preponderant flow of technology from the United States to Japan, the result could be to create new disparities that weaken the U.S. economic and technological base. It is too early to draw firm conclusions about long-term trends, but it is important to understand mechanisms for potential change.

TECHNOLOGICAL LINKAGES BETWEEN JAPAN AND THE UNITED STATES

In this regard, it is important to note that the network of private sector technology links between the United States and Japan is growing rapidly and taking new forms. While mechanisms for technological exchange are nothing new, the complexity of the interactions, their rapid increase, and the difficulty of carrying out comprehensive inventories all add to the challenge of assessing impacts. Interdependence is a fact of life, but observers draw different conclusions. Some conclude that the technology links are mutually beneficial, while others see the context as a zero sum game where Japan is best positioned to "win." Either way, the impacts could be significant, not only for U.S.-Japan relations, but also for the United States as a location of research and production.

The growth of Japanese foreign direct investment in the United States, particularly in high technology firms, presents a new set of challenges. Japanese direct investment grew rapidly in the late 1980s and one form of investment that raises some concerns involves Japanese purchases of small, high technology firms. The entrepreneurs that establish these companies are often our nation's technical leaders working on the cutting edge of technology development. These companies are natural targets for Japanese investors who have high valued yen to invest and a plan to have a global presence. The problem is that such acquisitions can under certain conditions result in a net transfer of technology to Japan and a weakening of the U.S. manufacturing base.

Whether investments, and particularly outright acquisitions, by Japanese companies will have positive or negative effects in the long run remains to be seen. To the extent that the investments are a mechanism for sharing Japan's advanced manufacturing technology, for nurturing technological expertise in the United States, for expanding exports from the United States, they will be welcomed. To the extent that the effect is to limit employment opportunities for U.S. technical personnel, managers and production workers, or to curtail U.S.-based participation in the full range of research, manufacturing and marketing activities, the evaluation is likely to be much more negative. Concerns have been raised, in particular, about foreign investments that involve takeovers of small companies with unique expertise important to the defense industrial base. While some excellent research has been carried out on foreign direct investment, we lack the evidence and experience to draw firm conclusions at this point on the long-term technological and economic impacts.

Another new trend is the expansion of Japanese participation in the U.S. university research system. This takes a number of forms—growing numbers of Japanese students in U.S. universities, contributions of endowed chairs and general facilities support by Japanese companies, establishment of laboratories on American campuses, contract research with U.S. university professors, and participation in university-based R&D consortia. Once again, it is too early to judge the long term impacts.

There is reason to welcome Japanese support for basic research in the United States that has "no strings attached," and corporations doing business in the United States and recruiting talent from U.S. universities have a natural responsibility in this regard. At the same time, academic leaders everywhere must work to ensure that industrial contributions from any source do not endanger academic freedom or skew work in universities too much toward the proprietary interest of the supporters.

U.S. companies are also beginning to establish R&D operations in Japan. Through joint ventures and other mechanisms, U.S. firms are expanding access to Japan's technology. Many of the largest and most successful of these companies believe that establishing a presence in Japan is prerequisite for learning from Japan—for tapping into Japan's advanced manufacturing know-how and for maintaining a significant share in Japan's market. U.S. companies must work harder to nurture contacts with Japanese university professors than their counterpart Japanese firms operating in the United States, since the postwar traditions of university-industry cooperation in Japan have been more informal than has been the case in the United States. In addition, as I mentioned earlier, the premier research occurs in Japanese corporate laboratories, and these are less accessible to outsiders.

There are signs of change that should be noted. Some of Japan's large electronics firms are making room for U.S. postdoctoral researchers in their laboratories. U.S. industry and the U.S. government are putting a stronger emphasis on programs of Japanese language training for technical personnel and on expanded acquisition of Japanese scientific and technological information. Much, however, remains to be done and some still question whether there is adequate demand in the market to support costly and long-term investments in these areas.

Another important area of change can be seen in Japan's initiation of international R&D projects. Up until quite recently, Japan has been a follower rather than a leader or initiator of international R&D efforts. Japan has recently proposed an international project on advanced manufacturing, and discussions in Tokyo in late November indicate that the groundwork has been laid to move to the next stage of a formal agreement on principles and the initiation of a feasibility study. When Japan takes the initiative in such projects, as will increasingly be the case in the future, U.S. industry and government will have to invest considerable resources in formulating a response. In view of the asymmetries noted earlier, it will be important to ensure that the projects yield concrete benefits to both sides, especially in the form of improved knowledge of and access to Japan's advanced manufacturing technology development and application system.

LESSONS AND POLICY IMPLICATIONS

There are many lessons that can be drawn from study of Japanese science and technology, particularly the policymaking system. Consensus building in Japan is not an easy process—it requires a lot of work and effort. But the overall conclusion that I draw is that public and private technology policymaking in Japan has generally contributed to a successful management of technological change and, thereby, to economic performance.

It is also important to look ahead to the future and ask how things might change. First, in the years ahead U.S. firms will face a more complex, technologically-based competitive challenge from Japan. Rather than competition being localized in a few key industries (steel, automobiles, semiconductors), the two countries will compete more deeply across the board—from science, to applied research, to commercialization and marketing. Japanese leaders are committed to developing indigenous technological capabilities in a broad range of areas that will contribute to building strength in a wide range of industries. Meanwhile, the globalization of business will make it important for U.S. firms to compete abroad as well as at home. If Japan's efforts to expand support for fundamental technology development succeed, as appears likely, Japan as a nation (as well as individual Japanese companies) will present an even greater competitive challenge in the future.

While it may be tempting to conclude that the best solution is to concentrate solely on building indigenous U.S. strengths, there are good reasons to question such an approach. The United States has the resources to support costly R&D investments, but it will be difficult to maintain unequivocal leadership in every area. Japan has the scientific and technological expertise and financial resources to contribute to global security and to alleviating environmental and other problems in developing countries and around the world. Japanese companies have developed manufacturing technologies and approaches to commercialization and long-term planning that could be useful to U.S. engineers and business planners. As global investment trends make it increasingly difficult to distinguish U.S. from "foreign" firms, moreover, a "go it alone" strategy would be difficult to implement.

What are the policy implications for the United States? First there are a number of global problems and scientific challenges that can be addressed through cooperative efforts involving Japan. Scientific research in some fields depends on the construction of costly facilities and equipment. Japan is participating in the space station program, but there may be opportunities for expanded cooperation in areas like robotics. In biomedical research, the United States and Japan can build on a basis of past cooperation in areas such as cancer research, and explore new areas of special challenge like human genome sequencing where Japan can contribute to international programs that avoid duplication of efforts. Japan has excellent work under way to predict and counteract natural disasters such as earthquakes and floods; Japan can leverage and expand these efforts by working with multinational organizations such as the United Nations.

Second, efforts can be strengthened to ensure that the United States and other countries have improved access to Japanese R&D particularly advanced manufacturing know-how. From the perspective of U.S. firms, participation in cooperative research projects supported by the government of Japan can be expensive in view of the high costs of locating researchers in Japan. At the same time, the experience can help to deepen understanding of how to operate in Japan's research system and of how Japan's technology policy is made and what its effects are likely to be. Japanese companies have perfected the art of "teaming up" to share the risks of going overseas; this general approach may be worth considering by U.S. companies, particularly if there are mechanisms for diffusion of knowledge gained to smaller firms and throughout U.S. industry.

Additional efforts will be needed on the part of Japanese government and industry to expand opportunities for foreign researchers and to support basic research accessible to non-Japanese. If U.S. technical personnel and business planners are to learn from Japan's innovation process, firsthand experience in Japan and with Japanese counterparts will be a key. U.S. organizations will need to create new incentives to learn from Japan and other countries: by nurturing employees who combine foreign language skills with technical expertise, by expanding efforts to monitor and acquire foreign technology, and by creating infrastructure that enables U.S. technical personnel to interact on a face-to-face basis with counterparts in Japan.

So far, many of the newly created opportunities in Japanese laboratories have been for students at the postdoctoral level. It seems especially important to expand programs of internship and study for younger students who are not yet committed to a career path that would make a foreign sabbatical difficult. Improved and expanded technical databases, libraries and lodging facilities in Japan could benefit Japanese as well as foreign researchers.

Third, efforts can be made to find synergies between U.S. and Japanese technical assistance and development assistance programs. Japan's aid program has grown rapidly, raising expectations on the part of developing countries that Japan will provide technical assistance in addition to the large infrastructure projects characteristic of Japanese aid in years past. Consultation between Japan and the United States and with other aid donors can maximize the benefits of technological cooperation with Eastern Europe and the Soviet Union. There should also be opportunities for U.S. firms and organizations to participate in Japan's government-funded aid programs if the process of priority setting and bidding for contracts can be made more transparent. This cooperation can benefit Japan as well as the United States by improving the quality of aid programs and by assuaging fears that Japan's aid program works only to Japan's commercial benefit.

Finally there is a need to examine joint ventures and other linkages between private sector organizations in the United States and Japan to ensure that both sides benefit. We should look for results that can be measured in terms of impacts on the U.S. economy and on U.S. technological capabilities. Joint ventures (and Japanese-owned subsidiaries in the United States) that transfer technology, develop new skills in the U.S. workforce, use locally produced components, and expand exports should be welcomed. We need to develop new mechanisms that permit the U.S. partners to learn about and benefit from the innovation process in Japan.

At this stage there is an urgent need for improved analysis of technological links between Japan and the United States, with special emphasis on the economic impacts, as a basis for developing a more coherent long term strategy for competing and cooperating with Japan. Through analysis and experience, a better understanding of how these linkages can be made to work for both sides should emerge.

Even if these priority issues are addressed, however, significant problems will remain that pertain to particular industries, fields of research, or research organizations. Many believe, for example, that the United States should not give up core industries such as semiconductors in the face of competition from Japan. When seri-

ous problems arise, they must be called out and candidly discussed with Japanese leaders from industry and academe as well as government.

The bottom line is that new efforts will be needed to ensure that the United States and Japan both remain leaders in science as well as technology. A division of labor that deepens U.S. excellence in basic research while perpetuating Japan's stress on commercialization of technology would be unacceptable.

It is likely that U.S.-Japan competition will intensify and take new forms in the 1990s. Without concerted effort and leadership from both countries, the asymmetries in science and technology that I have discussed today will not be transformed into complementary assets. In order to avoid the negative consequences of that result, public and private sector leaders in the United States will need to build a proactive strategy for competing and cooperating with Japan in advanced technology.

Representative HAMILTON. Dr. Finan.

STATEMENT OF DR. WILLIAM F. FINAN, PRINCIPAL, TECHNECON ANALYTICAL RESEARCH, INC.

Mr. FINAN. Thank you very much, Mr. Chairman. I appreciate the opportunity to appear today before the Committee. I think the Committee's interest in this topic is extremely timely and useful.

In my remarks today I would like to focus on the importance of encouraging and assisting the U.S. research establishment to monitor Japanese research and development programs.

In part my comments are based on a series of studies of Japan's organization and management of the research development commercialization process that I performed along with Dr. Jeffrey Frey of the University of Maryland. This work was performed under the sponsorship of the American Research Consortium and the Semiconductor Research Corporation. The view that I express today are strictly my personal ones.

Professor Frey and I have been visiting Japan regularly over the past two years to study how the larger Japanese companies train their researchers, how they rotate personnel through research and manufacturing positions and how they budget and plan their research projects.

We are examining these issues in order to understand what makes Japan's research organization so effective in moving new technologies to market. The overriding premise driving our interest in studying these aspects of the Japanese R&D establishment is the belief that it is important to achieve an accurate and complete understanding of how it functions in order to assess the effectiveness of our own research establishment.

The complete results of our earlier work have been made available to your staff. Rather than seek to simply summarize the specific findings from our studies, I would like to focus on what steps I think our government should be taking to strengthen the U.S. infrastructure that supports the U.S. research establishment's assess to Japan's technology.

Let me start with several general points and then move on to five specific recommendations.

Now I've been fortunate I think to have the background to look at Japan's research establishment over about the past eight years from the first episode I was working in the Department of Commerce and then more recently in the private sector.

One of the things that was very evident when I was in the government was that we had great difficulty in getting the American

research establishment to pay attention to events going on in Japan. We set up certain programs to foster access, but frankly we were always quite concerned that we were going to get the follow-through from the American research community that those programs needed.

So we decided to step back and look at it from a different angle, which was to try and foster a peer review process in the U.S. as a means to stimulate interest. So we were active, along with other agencies, to set up a program called JTECH, and this is discussed in one of your other papers.

Now JTECH has met with mixed results frankly. I think it hasn't had the success that we hoped, which was to create a nucleus of interest among the most senior and most reputable scientists and engineers that would spread the interest in Japan to other leaders and other areas and other researchers.

The other thing that we did at the same time was we sought access to the laboratories of NTT, which are roughly equivalent to the Bell Laboratories in certain areas with regard to their reputation and status in the international research community, and there we had again some mixed results. I think it was partly the reticence of the Japanese organization to move in directions that weren't historically ones they were comfortable with, but again we ran into the problem that we weren't getting enough follow through in the broad community.

We became quite frustrated at that. So I've always had the feeling that part of the problem of access has to be looked at as a problem that exists from the U.S. side, that we simply aren't mounting a sufficient and consistent and focused effort on access.

Now meanwhile one of the things that I've noticed that has been a striking change over the last 5 or 6 years that I have had contact with the Japanese research community is more and more in the discussions that I have with Japanese research managers at all levels, there is a recognition that Japan can't be seen as a free rider, that Japan has to play an integrated role contributing to the whole, that is the status of knowledge in general.

In the interviews that I've had with Japanese researchers they make it clear that they understand the need for a two-way flow of technology. But given that, does it mean that it automatically happens? The answer is obviously no. In large measure I feel that the burden of remedying any asymmetry in the way that technology flows between our two countries, as I mentioned before, falls largely on us.

Based on both my government and private sector experience, let me make five specific observations regarding the role of the U.S. Government vis-a-vis the issue of improving access of Japanese research base.

My first recommendation is really, and I would like to say it's a rather costless one, but I think it's an essential one, is that our political leaders have to continue to pressure the research community and the business community at large to pay attention to Japan, and that's why these hearings I think are important.

Second, the U.S. Government can focus a small portion of the existing research outlays, particularly in the defense area, onto an effort attracting Japanese R&D and seeking to reduce our infa-

mous tendency to rely upon the not-invented-here syndrome, that is the idea of going it alone.

It's obvious more and more as your summary at the beginning mentioned, we lead in very few areas, as the Japanese are tending to pull away from us in other areas, it's foolish to try and ignore what they are doing.

Third, I would recommend that there be a periodic audit of the U.S. resources devoting to monitoring Japanese technology with the intent of achieving greater visibility on those efforts and hopefully a better balance with less duplication of effort.

Fourth, the history of the Memorandum of Understanding or MOU between the United States and Japan that covers U.S. access to so-called dual use technology to Japan should be given a careful going over by Congress.

Basically the MOU was an attempt to give our defense research establishment a window on Japanese technology which might have strategic value. By almost all accountings it has failed, or more accurately failed to develop into a useful instrument. We should learn from our past mistakes, and in order to avoid future mistakes of this sort, someone should document what went wrong.

Last, I would like to suggest that the U.S. investigate the creation of a special facility in Japan, what I like to call a T-House for visiting U.S. researchers. The objective would be to lower the barriers, both cultural and cost-wise, for U.S. researchers, for business, government and academe.

The T-House would also serve as an institutional memory to assist in identifying and tracking leading researchers and institutions in Japan across all the major technical fields.

Let me just elaborate on a couple of the points that I've just mentioned.

The first point I want to focus on is the need to perhaps force the defense research establishment base to pay attention to what is going on in Japan, and I focus on this area because I think we have some real leverage here, which is to say the U.S. Government can change programs and practices here and these changes can have a major impact. It doesn't have to take a great deal of money in the process.

In particular I think we can provide incentives for U.S. companies to study and adopt Japanese technology to avoid reinventing the wheel. The process can be one whereby Congress could mandate that henceforth all new defense research and development programs need to have a competitive assessment statement when the research is being performed in a field where it is widely understood that the Japanese have advance knowhow.

In the extreme, perhaps, we could commit U.S. defense contractors to acquire Japanese technology through licensing or other means if that were a more effective means of developing the technology.

I might note that years ago in the 1950s it was the policy of the Department of Defense to require defense contractors to so-call second source, that is, if they were the prime contractor with unique capabilities to force the creation of a duplicate source.

Now more and more, whether people understand it or not, the prime source for certain key knowhow is coming out of Japan, and

we actually do have leverage over those Japanese suppliers. They want to sell as much as they can to our Defense Department, and I think the means should be found by which we duplicate the process we imposed on the American contractors, i.e., force a Japanese source to create an American based second source, and that would indicate there has to be a transfer of technical knowhow in the process.

The third point I just want to comment on a little further is the notion of an annual audit or report to Congress. I think this could be the responsibility of the President's Science Adviser. The audit would serve several purposes.

It would inform the various agencies of our government what their cohorts are doing as the right and left hand very often don't know what is happening unless somebody above them forces them to report.

I have noticed this very frequently in both the time I was in the Department of Commerce and elsewhere where all of the sudden you would find out there was somebody else doing something very similar to what you were doing and, absent someone from outside your agency bringing it to your attention, you never would have known about it.

Hopefully this process would not necessarily through a formal mechanism, but through an informal process, allow us to increase the coverage of areas where we are only spending sparse resources and avoid duplication where three or four agencies are spending significant resources essentially duplicating their effort.

In sum, I believe there is much we can do unilaterally to improve and focus our resources to address the challenge of Japan's technology events in the future as more and more of the major technological breakthroughs originate in Japan. The issue of gaining adequate access to Japan's research establishment would only gain in importance.

As I have tried to demonstrate, there is much we can do to ensure that we gradually achieve a better balance in the exchange of technology.

Thank you.

Representative HAMILTON. Thank you, Dr. Finan.

[The prepared statement of Dr. Finan follows:]

PREPARED STATEMENT OF DR. WILLIAM F. FINAN

I am Dr. William F. Finan. I appreciate the opportunity to appear today before the Joint Economic Committee.

In my remarks today, I would like to focus on the importance of encouraging and assisting the U.S. research establishment to monitor Japanese research and development programs. In part my comments are based on a series of studies of Japan's organization and management of the research-development-commercialization process that I have performed along with Dr. Jeffrey Frey of the University of Maryland. This work was performed under the sponsorship of the American research consortium the Semiconductor Research Corporation. The views that I express today are strictly my personal ones.

Professor Frey and I have been visiting Japan regularly over the past two years to study how the larger Japanese companies train their researchers, how they rotate personnel through research and manufacturing positions, and how they budget and plan their research projects. We are examining these issues in order to understand what makes Japan's research organizations so effective in moving new technologies to market. The overriding premise driving our interest in studying these aspects of the Japanese R&D establishment is the belief that it is important to

achieve an accurate and complete understanding of how it functions in order to in turn assess the effectiveness of our own research establishment. The complete results of our earlier work have been made available to your staff. Rather than seek to summarize specific findings from our studies, I would like to focus on what steps our government should be taking to strengthen the U.S. infrastructure that supports the U.S. research establishment's access to Japan's technology.

Let me start with several general points and then move to 5 specific recommendations.

Over the years I have spent examining Japan's R&D establishment, I have become increasingly impressed not only with the quality of the research effort in Japan, but also with the organizations that generate them. And, as Japan's technical capabilities in many areas equals or exceeds our own, it is shear folly to believe that we would benefit in any fashion in the long-run from policies that seek to reduce Japanese access to our technology base. In my view there is only one direction we can be moving in and that is to improve the institutional framework that allows the U.S. research establishment to effectively monitor and acquire Japanese technical knowhow.

Here let me note several aspects of my background in order to allow the Committee to gauge my views. While working as the assistant to the Under Secretary of Commerce, I was instrumental in setting up the program now called JTECH—one of your working papers discusses this program. As we originally envisioned the JTECH effort, we wanted to expose the best engineering and scientific talent in the U.S. to Japan's research results in order to stimulate their interest in tracking Japanese technical knowhow. We started this program out of the belief that there was inadequate understanding of the quality of Japan's research work among the engineering and scientific community in the United States. By exposing leading researchers to Japan's work, we hoped that they would influence their peers to spend more effort in evaluating Japan's R&D effort. I was also instrumental in negotiating several arrangements to open up the laboratories of Nippon Telegraph and Telephone—NTT—laboratories considered to be Japan's equivalent to our Bell Labs. Both of these efforts were intended to create institutional processes that would provide an ongoing window into Japan's research base.

More recently I have conducted extensive interviews with Japanese R&D directors, managers, and researchers—over 150 interviews to date—in order to gain insights into how they organize and manage the research process. We have learned a great deal through the openness of the Japanese research establish to assist us. Many in the U.S. are surprised when I inform them of the degree of openness of the Japanese research managers to provide myself and my colleague with information. But companies such as Toshiba, NEC, Fujitsu, Hitachi, and Mitsubishi have provided us literally with hours of time of their staffs at all levels. Based on my own experience, I can not subscribe to the belief that only Japan absorbs foreign knowhow but never supplies it in kind. In my interviews with Japanese researchers it is clear that they understand the need for a two-way street in the flow of technology. Does that mean that it automatically happens? Of course not. And, in large measure, I feel that the burden of remedying any asymmetry in the way that technology flows between our two countries falls largely on us.

Given that, and based on my experience both as a government official and as a private consultant with an interest in this issue, let me make 5 specific observations regarding the role of the U.S. government vis-a-vis the issue of improving access to the Japanese research base.

First, and everyone should like this recommendation because it is reasonably costless, it is essential for the U.S. government to continue to jawbone the U.S. engineering and scientific establishment to pay attention to Japan. Our corporate leaders must continue to know that it is a national priority that we stay abreast of Japan in key, strategic technologies.

Second, the U.S. government can focus a small portion of existing research outlays onto the effort at tracking Japanese R&D and, at the same time, reducing the not-invented-here inertia so prevalent in the U.S. research establishment.

Third, there should be a periodic audit of the U.S. government resources devoted to monitoring Japanese technology with the intent, through greater visibility, of achieving a better balance with reduced duplication of effort.

Fourth, the history of the Memorandum of Understanding (MOU) between the U.S. and Japan that covers U.S. access to so-called dual-use technology in Japan should be given a careful going over by Congress. Basically, the MOU was our attempt to give our defense research establishment a window on Japanese technology which might have strategic value. By almost all accountings it has failed—or more correctly, never developed into a useful instrument. We should learn from our past

mistakes. In order to avoid future mistaken efforts of this sort, someone should document what went wrong.

Lastly, I would like to suggest that the U.S. investigate the creation of a special facility in Japan—what I call T-House—for visiting U.S. researchers. The objective would be to lower the barriers, both cultural and costwise, for U.S. researchers from business, government, and academe, The T-house would also serve as an institutional memory to assist in identifying and tracking leader researchers and institutions across all major technical fields. Attached to my statement is an editorial that explains the concept further.

Let me elaborate on several of these suggestions.

The inertia in the United States technical community regarding Japan remains substantial. Political leaders concerned about the competitive state of the U.S. economy can play a critical role in continuing to remind the research community that they see a need to pay attention to developments in Japan. We continue to have a problem of supply and demand that only continuous jawboning of the issue is likely to see a real change. By problem of supply and demand, I mean that we continue to see a fairly weak demand among the U. S. research establishment for a supply of technical information on Japan. Only if that demand grows and, in turn, pressures build for real resource commitments grow, will we see a substantial shift in the climate in the U.S. Therefore, the most cost effective means to bring about a long-term change is through jawboning by our political establish. Tell our business leaders that they need to be alert—and give the new generation of young engineers traveling to Japan a sense that they are participating in a mission of national importance. Perhaps someday our companies will value their executives who have spent time in Japan to the same degree that Japanese executives see the path to top requiring spending time in the U.S.

For those who feel that we need to create more than simply political waves, we can reorient some of our expenditures for research projects—especially in the defense area. Thus, point two, we can provide incentives for American companies to study and adopt Japanese technology—to avoid reinventing the wheel. The multibillion-dollar Defense procurement program could be used to provide powerful incentives to focus companies' attention on Japanese technology. For example, Congress could mandate that henceforth all new defense R&D programs need to have a competitive assessment performed that specifically identifies the state of Japanese technology in the field that the program works. Perhaps, in the extreme, we could commit the contractor to acquiring Japanese technology through licensing or other means if that were a more cost effective means of developing the technology.

Third, I would strongly urge that an annual audit or report to Congress be mandated on the different agencies efforts with regard to monitoring Japanese technology. This report could be prepared by the President's Science Advisor. It would serve several purposes. It would inform the various agencies what their respective level of activities is and, perhaps, secondarily, permit some degree of informal rationalization to result. Areas of under-representation as well as duplication would be evident, as well as an assessment of the overall level of resource being invested in the effort.

In sum, I believe there is much we can do unilaterally to improve and focus our resources to address the challenge of Japan's technological advances. In the future, as more and more of the major technical breakthroughs originate in Japan, the issue of gaining adequate access to Japanese research establishment will only gain in importance. As I have tried to demonstrate, there is much we can do to ensure that we gradually achieve a better balance in the exchange of technology.

Representative HAMILTON. Dr. Flamm.

STATEMENT OF DR. KENNETH FLAMM, SENIOR FELLOW, THE BROOKINGS INSTITUTION

Mr. FLAMM. Good afternoon, and thank you for inviting me to testify.

I'm going to talk a bit this afternoon about the commercial side of the science and technology picture, and I'm going to specifically focus on U.S.-Japanese competition in semiconductors and the particular issues raised by U.S. policy in this sector.

The issues I'm going to be talking about extend well beyond semiconductors, and in general the precedent set in this sector will

have an enormous impact on the rules of the game for high technology trade in general over the next decade.

Let me start out by talking about the U.S.-Japan semiconductor trade arrangement signed in 1986, which basically followed close to a decade of intense political struggle between the American semiconductor manufacturers and their Japanese competitors.

At issue were the bounds of acceptable business practices and government policy within a global industry. The concrete complaints of the American industry related to Japanese pricing of their chip exports, the dumping issue, Japanese Government policies to promote the development of the Japanese chip industry, particularly the use of R&D subsidies, the targeting issue, and restrictions, formal and informal, public and private on the ability of American firms to sell their products in Japan, the market access issue.

A 1986 trade arrangement addressed two of these three issues, the market access issue and the dumping issue. A so-called secret side letter to the arrangement specified that a 20 percent Japanese market share for foreign chip makers was a reasonable target for 1991 and in this manner tackled the market access issue.

In many respects, this has been the most successful part of the 1986 arrangement. Foreign market share gradually climbed from under 10 percent to over 13 percent in Japan by the U.S. industries' count.

There is no doubt that substantial efforts by Japan's Ministry of International Trade and Industry, MITI, played a key role in this rise. Indeed, the very success of its pressure on Japanese firms to buy foreign chips undercuts a claim that MITI occasionally makes, that is, that it has no significant influence over firms within Japan's market economy.

Indeed, as negotiating postures are fixed over the coming months, we may again find a foreign market share increase in Japan slowing or even declining and MITI once again asserting its inability to cajole Japanese firms into buying more from abroad.

By the same token, however, the willingness of American chip companies to jump onto the MITI bandwagon when it is perceived to be moving in their direction and their interest raises doubts about their determination to get MITI out of the administrative guidance business within the Japanese electronics industry.

Paradoxically, the 1986 trade arrangements served as the framework for substantial expansion of MITI's influence over the Japanese industry, reversing a trend towards a diminishing MITI presence that could have been detected earlier in the decade.

The problem for the U.S. semiconductor industry is that it cannot have it both ways. If American chip-makers generally want the U.S. Government to insist that MITI's post-war role as the administrative guide for Japanese industry has no place in the market-driven high-tech trading system of the 1990s and continue to push for structural change in Japan, it cannot at the same time promote an agenda that implicitly strengthens a system of guidance and targeting it has condemned.

So the American chip company's position might be interpreted as their giving up on continuing pressure for an open trading system

and their tacit support for a system of managed trade, politically administered market shares.

While this no doubt serves the U.S. chip industry's immediate objectives, I can only wonder how we are going to deal with the longer-term consequences of this precedent for other high-tech industries and other markets where successful U.S. companies are highly dependent on foreign sales and may very well wind up on the losing end of market share limits.

The second part of the arrangement, constraints on pricing of Japanese semiconductors, was actually somewhat less helpful to U.S. interests than the first part. Now I'm not going to go into a great deal of detail, but let me note that it was never alleged that Japanese chips were being sold in the U.S. market at prices below those prevailing in the home market in Japan, the usual notion of what dumping is.

Instead, it was asserted that Japanese producers were selling all their chips worldwide at prices which did not cover the full average cost of production, a technical definition of dumping that came into use in the U.S. in the 1970s.

Now this notion of dumping raises a lot of interesting questions for American high-tech industries. R&D costs, the definition of a high-tech industry, are relatively fixed and occur up front before production is undertaken. They are generally expensed over the entire life cycle of a product within high-tech industries and not all loaded into the first few units of the product shipped that is, used to increase the price of the first few units.

Also, in the semiconductor industry so-called learning economies are important. Manufacturing costs decline with the cumulative output of the product. For these reasons it is economically rational for a producer to quote a price for deliveries on large contracts which may well be below the current average cost of production, reflecting the spreading of fixed R&D costs over larger volumes of output and predictable declines in manufacturing costs with further production experience.

Such forward pricing has been standard practice within the U.S. chip industry (and—sure—it's as American as apple pie and motherhood), and for that matter, many other American high-tech industries.

Thus, if the standard applied to the Japanese by the Commerce Department of defined dumping were to be applied to American companies by other nations or domestically within the United States for that matter, American companies would routinely be guilty of dumping in the course of their normal competitive business practices.

Thus, the U.S. Government would be well advised to move cautiously in expanding the application of this concept since it could well rebound to the considerable detriment of U.S. high-tech industry sales to foreign markets.

Unfortunately, without a whole lot of public discussion, the Commerce Department appears to be moving aggressively to promote this practice as a global standard within the Uruguay Round of trade negotiations.

I would ask this Committee to urge restraint on Commerce and further explore the potential consequences for U.S. high-tech indus-

tries before establishing these rules as a new international standard.

However, the U.S. semiconductor industry did have legitimate grounds for concern with respect to Japanese pricing practices, in particular the idea that essentially by pricing below average cost, expensed over the entire product life cycle, you could well have some form of predatory pricing designed to force financially strapped American competitors out of the semiconductor business.

However, for this to make economic sense, the Japanese predators would then have to make above-normal profits afterwards to justify loss-creating investments in predation. It is all the more ironic then that, in my opinion, much of the price monitoring apparatus set up by MITI in administering the 1986 trade arrangement had the effect of making it easier for Japanese industry to organize itself collectively as a quasi cartel and extract monopoly profits from non-Japanese chip users.

I don't really have the time to go into detail here, but I have appended a speech I made in 1989 to a group of semiconductor industry executives which lays out some of the facts then available.

But the important question is where do we go from here.

First, we should recognize that we have some useful bargaining chips. The Japanese industry despises the market share targets that MITI has saddled it with, and there is ample evidence that MITI in earlier years used a variety of means, formal and informal, to discourage purchase of American chips. So in some sense market share targets may be regarded as affirmative action addressing the long historical record of discrimination against U.S. products within the Japanese market.

The U.S. fair trade laws, despite their somewhat economically irrational aspects, which I have talked about briefly, and the continuing danger that they might serve as the model for measures that others could turn against our high-tech industries, provide some powerful and expedient tools that could be used against Japanese imports should Japan be unwilling to take further steps towards an open trading system.

But the bottom line is, just what should we be asking when we use these chips, when we brandish our sticks? The issue ultimately is that tacit acceptance of anti-competitive behavior by groups of national firms and formal and informal actions by governments to give their national firms special advantages are incompatible with an open trading system for high-technology products.

I believe we should present Japan with a question and a choice.

The question is this. What precisely is the purpose of MITI's elaborate industrial policy bureaucracy in an increasingly market-driven Japanese economy? Those portions of the industrial policy structure in MITI charged with administering or developing R&D programs, in which I should add all industrial country governments play an important role, could easily be transferred to MITI's Agency for Industrial Science and Technology, AIST, which is exclusively concerned with technology development.

Many of the other functions these industrial policy industry bureaus have served historically in the post-war period, particularly that of supplying administrative guidance to firms and industries,

are incompatible with the open trading system that Japan has now pledged to support.

The choice which I believe should be presented to Japan is this. If MITI wishes to continue to offer administrative guidance to Japanese industries, it is not unreasonable to insist that affirmative action be a part of the administrative guidance agenda.

On this basis we should insist that a market share target is a reasonable approach to remedying the well-documented historical use of this guidance in the past to discourage foreign sales.

Furthermore, we should serve notice that we intend to raise the stakes and push harder for similar goals in other sectors in which MITI has a long-standing historical pattern of intervention, including the mushrooming Japanese computer market.

If, on the other hand, MITI is willing to embrace change and become part of an effort to preserve an open international trading system in high-technology goods, we should support this effort. We should be willing to forswear the use of market share targets and caps if MITI is willing to dissolve or greatly reduce its electronics and computer industrial policy staff and transfer R&D programs, a legitimate function, to AIST.

Because the competitive marketplace is one of the minimal preconditions for an open trading system in high technology goods, we should continue to insist on vigorous enforcement of antitrust laws within Japan and a larger and more aggressive Japan Fair Trade Commission.

Over the long haul, of course, a truly multilateral framework will be required to build the sort of open trading community that serves the common international interests. Key elements of that program should include a common set of minimal international standards on antitrust and competition policy, negotiated reciprocity in access to internationally funded R&D programs in order to remove R&D subsidies as a means of selectively favoring national firms' competitive position in global markets, and negotiation of an international framework for equitably sharing support for basic research for the common benefit of all among the entire trading community.

But it would be short-sighted at best and regressive at worst not to use the expiration of a semiconductor trade arrangement as an opportunity to at least build towards a badly needed solution to some of the mounting frictions which threaten world trade in high technology products. Let us spend our bargaining chips wisely and invest for the long term.

Thank you.

[The prepared statement of Dr. Kenneth Flamm follows:]

PREPARED STATEMENT OF KENNETH FLAMM, SENIOR FELLOW, THE BROOKINGS INSTITUTION [1]

Good afternoon. Thank you for inviting me to testify. I will give you a brief overview of where I believe policies affecting U.S.-Japan competition in semiconductors are headed, and why I think that the issues raised by U.S. policy in this sector are broad and far-reaching. The precedents set will have an enormous impact on the rules of the game for high technology trade, in general, over the next decade.

[1] The views expressed are purely personal, and do not reflect the positions of other staff, officers, or Trustees of the Brookings Institution.

The U.S.-Japan semiconductor trade arrangement, signed in 1986, was preceded by nearly a decade of intense political struggle between American semiconductor manufacturers and their Japanese competitors. At issue were the bounds of acceptable business practices and government policy within this global industry. The concrete complaints of the American industry related to Japanese pricing of their chip exports—the "dumping" issue; Japanese government policies to promote the development of the Japanese chip industry, particularly the use of R&D subsidies—the "targeting" issue; and restrictions, formal and informal, public and private, on the ability of American firms to sell their products in Japan—the "market access" issue.

The 1986 trade arrangement addressed two of these three issues. A so-called "secret" side letter to the arrangement specified that a 20 percent Japanese market share for foreign chip makers was a reasonable target for 1991, and in this manner tackled the market access issue. In many respects this has been the most successful part of the 1986 arrangement: foreign market share has gradually climbed from under 10 percent to over 13 percent in Japan, by the U.S. industry's count.

There is no doubt that substantial efforts by Japan's Ministry of International Trade and Industry (MITI) played a key role in this rise. Indeed, the very success of its pressure on Japanese firms to buy foreign chips undercuts another claim that MITI occasionally makes, that it has no significant influence over firms within Japan's market economy. Indeed, as negotiating postures are fixed over the coming months, we may again find the foreign market share increase slowing, or even declining, and MITI once again asserting its inability to cajole Japanese firms into buying more from abroad.

By the same token, however, the willingness of American chip companies to jump onto the MITI bandwagon when it is perceived to be moving in their interest raises doubts about their determination to get MITI out of the "administrative guidance" business within the Japanese electronics industry. Paradoxically, the 1986 trade arrangement served as the framework for a substantial expansion of MITI's influence over the Japanese industry, reversing a trend toward a diminishing MITI presence that could be detected earlier in the decade.

The problem for the U.S. semiconductor industry is that it cannot have it both ways. If American chip makers genuinely want the U.S. government to insist that MITI's postwar role as the administrative guide for Japanese industry has no place in the market-driven high tech trading system of the 1990s, and continue to push for structural change within Japan, it cannot at the same time promote an agenda that implicitly strengthens the system of guidance and targeting it has condemned.

So, the American chip companies' position might be interpreted as their "giving up" on continued pressure for an open trading system, and their tacit support for a system of managed trade—politically administered market shares. While this no doubt serves the U.S. chip industry's immediate objectives, I can only wonder how we are going to deal with the longer term consequences of this precedent for other high tech industries and other markets, where successful U.S. companies are highly dependent on foreign sales and may very well wind up on the losing end of market share limits.

The second part of the arrangement, constraints on pricing of Japanese semiconductors, was less helpful to U.S. interests. It is important to observe that it was not alleged that Japanese chips were being sold in the U.S. market at prices below those prevailing in the home market, the usual notion of what "dumping" is. By most accounts, the opposite situation prevailed, with U.S. prices slightly above Japanese price levels. Instead, it was asserted that Japanese producers were selling all their chips, worldwide, at prices which did not cover the full average cost of production, a circumstance which technical changes in U.S. trade law during the 1970s had also made actionable as "dumping".

Now this notion of "dumping" raises a lot of interesting issues for American high tech industries. R&D costs—the definition of a high tech industry—are relatively fixed and occur up front, before production is undertaken. They are generally expensed over the life cycle of a product within high tech industries, not all loaded onto the first few units of the product shipped. Also, in the semiconductor industry, so-called "learning economies" are important—manufacturing costs decline with cumulative output of the product. For these reasons, it is economically rational for a producer to quote a price for deliveries on large contracts which may well be below the current average cost of production, reflecting the spreading of fixed R&D costs over larger volumes of output, and predictable declines in manufacturing cost with further production experience.

Such "forward pricing" has been standard practice within the U.S. chip industry, and for that matter, many other American high tech industries. Thus, if the stand-

ard applied to the Japanese by the Commerce Department to find "dumping" were to be applied to American companies by other nations, or domestically, within the United States, American companies would routinely be guilty of "dumping" in the course of their normal, competitive business practices.

Thus, the U.S. government would be well advised to move cautiously in expanding the application of this concept, since it could well rebound to the considerable detriment of U.S. high tech industries' sales in foreign markets. Unfortunately, without a whole lot of public discussion, the Commerce Department appears to be moving aggressively to promote its practices as a global standard within the Uruguay Round of trade negotiations. I would ask this Committee to urge restraint on Commerce, and further explore the potential consequences for U.S. high tech industries before establishing these rules as an international standard.

However, the American semiconductor industry did have some legitimate grounds for concern with respect to Japanese pricing practices. In principle, because there are economies of scale in chip making, a well-financed Japanese company could conceivably sell chips at prices which would not allow it to recover its costs, even when revenues and costs were (in a more economically rational fashion) added up over the entire product life cycle. The losses it thus absorbed might be seen as a form of predatory pricing, designed to force its less well-endowed American competitors out of the business.

But for this to make economic sense, the Japanese predator would then have to make above-normal profits afterwards, to justify its loss-creating investment in predation. This, in turn, means it must be able to extract monopoly profits in a market now rendered less than competitive. Thus, "life-cycle" below-cost pricing as a predatory tactic only makes sense if monopoly power is created, maintained, and later exercised in order to offset the losses initially sustained.

It is all the more ironic, then, that in my opinion, much of the price monitoring apparatus set up by MITI, in administering the 1986 trade arrangement, had the effect of making it easier for the Japanese industry to organize itself collectively as a quasi-cartel, and extract huge monopoly profits from non-Japanese chip users. I do not have time to lay out the basis for my views, but have submitted with my testimony a speech delivered to a group of industry executives in early 1989 setting out the facts then available.

Developments since then have confirmed my belief that major Japanese chip makers are behaving in an organized, non-competitive fashion. When the market for memory chips faltered in the spring of 1989, and prices began to fall, the major Japanese producers, as a group, actually cut back their production runs for these chips, in an effort to stabilize prices and shore up their profits. Non-Japanese production rose steeply over this period.

The natural economic antidote for "life cycle" below-cost pricing predation is an active and vigorous competition policy. If the potential predators are forced to compete with one another, or if entry or re-entry into the market is encouraged and fostered (or even subsidized as a retaliatory tactic), the above-normal returns which might make predation a profitable course will not be forthcoming.

MITI's implementation of the price monitoring measures called for by the trade arrangement, ironically, made the institutionalization and administration of monopoly power among Japanese producers easier, not harder. This problem has implicitly been acknowledged by American industry: in a recent joint position worked out between the U.S. semiconductor and computer industries, the price-fixing aspects of the current arrangement were dropped from a proposal for its successor.

Where do we go from here? First, we should recognize that we have some useful bargaining chips. The Japanese industry despises the market share targets that MITI saddled it with. And there is ample evidence that MITI, in earlier years, used a variety of means, formal and informal, to discourage purchase of American chips. In some sense, market share targets might be regarded as "affirmative action" redressing a long historical record of discrimination against U.S. products.

The U.S. fair trade laws, despite their economically irrational aspects, and the continuing danger that they might serve as the model for measures that others could turn against our high tech industries, provide some powerful and conveniently expedient tools that could be used against Japanese imports should Japan be unwilling to take further steps toward an open trading system. The Commerce Department can self-initiate anti-dumping actions, and for reasons just described, current procedures make it highly probable that "dumping" behavior can be discerned in most high tech industries if one is inclined to look hard enough. Furthermore, recent changes in the trade laws make it possible to take action against "downstream" products if inputs are found to have been dumped. The threat of retaliation

against Japanese exports of consumer or industrial electronic systems would be a very large chip, indeed.

So, the bottom line is, just what should we be asking for when we brandish these sticks? The issue, ultimately, is that tacit acceptance of anticompetitive behavior by groups of national firms, and formal and informal actions by governments to give their national firms special advantages, are incompatible with an open trading system for high technology products. I believe we should present Japan with a question, and a choice.

The question is, what is the purpose of MITI's elaborate industrial policy bureaucracy in today's market-driven Japanese economy? Those portions of the industrial policy structure charged with administering R&D programs (in which all industrial country governments play an important role) could easily be transferred to MITI's Agency for Industrial Science and Technology AIST), which is exclusively concerned with technology development. Many of the other functions these bureaus have served historically, in the postwar period, particularly that of supplying "administrative guidance" to firms and industries, are incompatible with the open trading system that Japan is now pledged to support.

The choice which I believe should be presented to Japan is this. If MITI wishes to continue to offer administrative guidance to Japanese industries, it is not unreasonable to insist that "affirmative action" be a part of the administrative guidance agenda. On this basis, we should insist that a market share target is a reasonable approach to remedying the well-documented historical use of this guidance, in the past, to discourage foreign sales. Furthermore, we should serve notice that we intend to raise the stakes and push harder for similar goals in other sectors in which MITI has a longstanding historical pattern of intervention, including the mushrooming Japanese computer market.

If, on the other hand, MITI is willing to embrace change and become a part of an effort to preserve an open international trading system in high technology goods, we should support this effort. We should be willing to forswear the use of market share targets and caps if MITI is willing to dissolve—or greatly reduce—its electronics and computer industrial policy bureaus, and transfer R&D programs to AIST. Because a competitive marketplace is one of the minimal preconditions for an open trading system in high technology goods, we should continue to insist on vigorous enforcement of antitrust laws within Japan, and a larger and more aggressive Japan Fair Trade Commission.

Over the long haul, of course, a truly multilateral framework will be required to build the sort of open trading community in high tech that serves the common international interest.[2] Key elements of that program should include a common set of minimal international standards on antitrust and competition policy; negotiated reciprocity in access to nationally funded R&D programs, in order to remove R&D subsidies as a means of selectively favoring national firms' competitive position in global markets; and negotiation of an international framework for equitably sharing support for basic research, for the common benefit of all, among the entire trading community.

But it would be short-sighted at best, and regressive at worst, to not use the expiration of the semiconductor trade arrangement as an opportunity to at least build towards a badly needed solution to some of the mounting frictions which threaten world trade in high tech products. Let us spend our bargaining chips wisely, and invest for the long term.

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[2] I have sketched out this logic in "Semiconductors," chapter 5, in G. Hufbauer, Ed., Europe 1992: An American Perspective, (Washington: Brookings), 1990.

Policy and Politics in the International Semiconductor Industry

Kenneth Flamm[1]

Presented to the SEMI ISS Seminar, Newport Beach, CA
January 16, 1989

Technological change in computers and electronics continues unabated today, four decades after the computer's birth, bringing with it a continuing transformation of the world economy. The computer industry is clearly the most important industry in the world today, and it sits firmly astride your industry, the semiconductor industry. Within the ups and downs of all that unceasing change there was a certain continuity, a rhythm that appears to have been broken in 1988. What happened? Why did it happen? How should we respond? Those are the questions I want to pose for your expert opinions today, questions which are asked not just in Silicon Valley, but increasingly in Washington D.C.

Some of you may wish that Washington's gaze had never turned to your fair Valley. But that is wishful thinking indeed, since without Washington there would have been a much smaller Valley, maybe even no Valley at all. And it is the Valley that has been tugging at Washington's sleeve over the last decade, not the reverse. Government policy has always been an important factor in the growth of the semiconductor industry. What is different today is that for the first time, life is complicated by competition from our technological equals abroad, and the resulting political struggles over national policy have assumed a visibility and importance that overshadow anything we had seen before.

I would like to do five things in today's presentation. First, I'd like to remind you how Washington has always hovered over the Valley like the Goodyear Blimp, silent at times, but never far from sight. In recent years Tokyo too has entered the Valley's airspace. Second, I'd like to analyze the events of the past two years, and ask whether we are seeing business as usual, or something totally new, something likely to fundamentally change the computer and semiconductor industries. Third, I'd like to explore why Washington is becoming so much more interested and involved. Fourth, I'd like to raise the issues that I believe public policy will have to address. And finally, I'd like to ask if we really want to continue on the path that's been blazed in the last two years.

I. The Historical Role of Government

Contrary to some popular mythology, the U.S. government played an important role in the initial development of the semiconductor industry, continued to influence it in important ways over the years, and again plays a key role today. Like many of today's high technology industries, its roots run back to World War II. While the transistor was invented at the Bell Labs after the war, and Bell did not receive a military R&D contract until after the fact, the technology built on a massive wartime research program on the fundamental properties of germanium and silicon, inspired by the unreliability of silicon diodes used in radar. The services also paid for a quarter of Bell's semiconductor R&D over the years 1949-58. Military users financed a large share of semiconductor R&D in the 1950s, directly through contracts, and indirectly through premium prices paid for new, leading edge devices. The military also gave grants to firms to build huge production facilities. The government continued to pay for a large share of R&D through the early 1970s, roughly half of the expenditure from 1958 through 1970 (see figure 1). The

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military also paid for the early applications of semiconductors-- at Bell, the first use of the transistor in laboratory equipment was paid for by the Navy, the development of the power transistor and the first transistorized computer were funded by the Air Force. As late as 1959, a Congressional study estimated that federal funding paid for 85 percent of American electronics R&D.[2]

Though the invention of the integrated circuit in 1959 did not draw on military funding, it was motivated by the existence of a large military market for devices with the appropriate characteristics, and drew on process technologies developed on government contract. The photolithographic techniques used to etch integrated circuits were developed at Centralab in the early 1950s on an Army contract. Similarly, printed circuit boards and wave soldering techniques, which were to make use of ICs economic, were developed on government contracts.

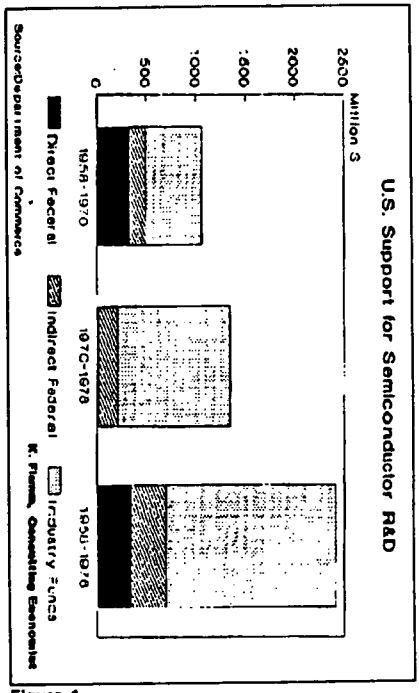


Figure 1

And, of course, the bulk of the R&D expense for the computer-- the single most important application of ICs-- was paid for by government through the early 1960s. The use of ICs in military and NASA computers jumpstarted U.S. IC production in the early 1960s.

The late 1960s and early 1970s were years of declining military budgets and federal investments in semiconductor and computer R&D (since the military had always paid for most of this effort). But the semiconductor and computer industries had grown into an enormous commercial market, and self-sustaining growth. The Valley prospered.

That is not to say that government was out of the picture while the Valley was building commercial castles on two decades of federally-funded foundations. It was just less noticeable amidst the noise and confusion. At the edge of the envelope, where progress is costly, risky, and difficult to lay claim to, those dollars still made a big difference. In computers, your tax dollars helped create things like artificial intelligence, networks, parallel computers, CAD systems, UNIX, and bought most of the supercomputers in the United States. In semiconductors, exotic semiconductors (i.e., gallium arsenide), circuit design tools, silicon foundries, RISC processors, process modeling software-- all moved forward with a significant push from Uncle Sam.

But others were not idle, and copied our success. Their governments invested large sums in

[2] See Kenneth Flamm, **Creating the Computer: Government, Industry, and High Technology**, (Washington: The Brookings Institution) 1988, p. 16.

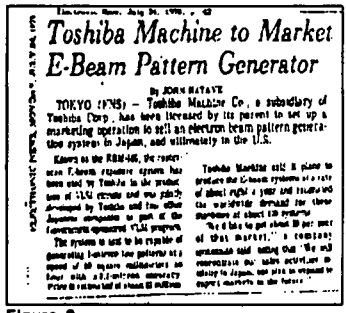
computer and semiconductor technology. Much of it was frittered away, especially in Europe, whe money was invested in "national champion" companies granted preferential treatment within the shelte of their national market. The Europeans listened to their experts and squandered resources building scale models of IBM. In Japan, however, funds were used far more effectively. Competition was maintained within the sheltered national market. The elite bureaucrats in the Ministry of International Trade and Industry (MITI) experimented with different ways of organizing their public R&D investments, and hit on one very successful idea. Money was put into "middle ground" research and very early development in cooperative projects whose cost was shared among competing firms, and the government. In the mid-1970s, some long term projects that had been started parceled out to individual firms were even reorganized in midstream as cooperative research associations.[3]


VLSI Projection Aligner by Canon

Figure 2

Some Americans pooh-pooh the idea that these cooperative research projects were worthwhile, and argue that companies had to have their arms twisted by MITI to participate. Well, the proof is in the pudding. One of the projects you folks probably know about was the VLSI program, run from 1976 to 1979, and terminated prematurely after political pressure was applied by the United States. That program helped participating firms develop one micron device technology, submicron process technology, and 64K memory chips. Figures 2 and 3 show a couple of the machines that were developed early on in that program, and commercialized by firms that have gone on to make a name for themselves in this business. When the program was terminated by the government, the firms involved felt sufficiently convinced of the worth of the effort to launch a three year "private sector edition" of the VLSI program, to finish up the research agenda, with no public sector funding.

Figure 4 shows some of the largest and most important of these cooperative research projects. I should note that smaller scale efforts, like current work in the area of X-ray lithography, are probably also going to produce useful results but do not show up in this listing. An important point to remember is that MITI's policies to promote semiconductor technology have always been focused on applications in computers. The computer systems industry is the ultimate objective of MITI policies in the area, and semiconductors have always been viewed as an instrument to that end.


Toshiba Machine to Market E-Beam Pattern Generator

By JOHN HATAVE

TOKYO (KYODO) – Toshiba Machine Co., a subsidiary of Toshiba Corp., has been licensed by its parent to set up a marketing operation to sell an electron beam pattern generation system in Japan, and ultimately in the U.S.

Figure 3

MITI did not sit still, and experimented with different refinements and directions, and the model evolved. But its R&D program still basically revolves around cooperation among competitors in the pre-

[3] See Kenneth Flamm, **Targeting the Computer: Government Support and International Competition**, (Washington: The Brookings Institution) 1987, pp. 131-136.

commercial stages of development of a new technology, where it is difficult to exclude others from use of results, where knowledge is more difficult to capture or **appropriate** for private use. Competing firms then take those results and use them to create commercial products.

MITI Support for Semiconductors
Major R&D Efforts

Project	Comments
1964 Digital Computer ICs	NEC, Hitachi, Fujitsu announce IC Computers in 1966
1966-71 Super High Speed Electronic Computer Project	1st semiconductor memory, high performance logic, LSI chips
1971-80 PIPS Project	16-bit microprocessor
1972-74 IC Development Program	Liberalization of Japanese mkt.
1976-79 VLSI Program	Terminated by U.S. pressure; 'private sector edition' 3 yrs more; 1 micron device tech, sub micron process tech, 64K DRAM, Canon stepper, Toshiba E-beam system, etc.
1979-83 Next Gen Computer Basic Tech Program	
1981-86 New Electron Devices	Superlattice devices, 3-D ICs, bioelectronic devices.
1986-93 Advanced material processing & machining system	Advanced surface processing w/ laser/ion beams; elec applictns

K. Flamm, Consulting Economist

Figure 4

By the late 1970s, U.S. semiconductor companies began to feel the hot breath of real Japanese competition on their necks. The American military, traditional patrons of the industry, took another shot at pushing the technology, with the VHSIC program. A billion bucks later, it became clear that the thrill was gone. The commercial industry had moved in a different direction from an increasingly specialized and insular military market. In the early days of the technology, they couldn't help but be much closer. And it was never clear that the federal spending pattern of the very early days was particularly efficient or effective: there was no serious foreign competition to test the policy. By the late 1970s, competent foreign competitors had materialized and were spending respectable sums. In high tech, being there first, or perhaps second, is the name of the game, and bang per buck had begun to become an issue. The chorus of voices calling for a more commercially relevant and useful R&D policy began to grow, and today projects a reasonably loud refrain.

American semiconductor companies faced serious competition indeed in the early 1980s, and Washington began to hear more and more from the Valley. First it was targeting, and then it was market access, and then it was quality, and then it was dumping, and dumping and market access again. This is not to say there wasn't something to all the complaints. But there were also technology problems, problems that were finally acknowledged with the recent formation of Sematech. The trade frictions with Japan grew, and a large and lucrative industry revolving around Washington's dealings with Tokyo.

At this point the Semiconductor Trade Arrangement of 1986 was signed, and tranquility was restored to the land. But then DRAM prices did something they had never done before. They rose and rose and then stayed high. Some began to wonder if something fundamental hadn't happened to the industry.

II. The DRAM Crisis: Wiggle or Watershed?

Some argue that what happened in the DRAM market in 1988 was a transitory phenomenon, a nasty but temporary blip in an industry known for its accentuated cyclical ups and downs. The alternative analysis is that a major structural change in the international semiconductor business has occurred, and that the crisis of 1988 augurs equally unpalatable future trends. If one believes the

"temporary blip" analysis, no special actions other than patience and a willingness to dip into deep, cash-filled pockets are required, until the current cyclical extreme shortage passes. But for a moment consider the worst case, that the crisis of 1988 reflects a new configuration of political and economic forces-- an unprecedented degree of monopoly power among Japanese DRAM producers, the demonstrated willingness of these producers to act in concert and reap economic advantage from their strategic position, and the support of the Japanese government in organizing such collusive action. Then Washington has a new set of worries to face and ought be thinking very hard indeed about its possible responses.

Is the current situation "normal"? Some of the available evidence points to the "structural change" interpretation of recent events in the DRAM market. To begin, it is quite clear that there is nothing the least bit "normal" about recent supply and pricing patterns in the DRAM market, even when compared to past periods of tightness in the semiconductor market. Figure 5 displays historical trends in price per bit and aggregate supply of bits in memory chips over the last decade. Generally, price and supply have moved together-- supply rising and price falling more slowly in periods of increasing demand, price and supply falling more sharply when demand slacked off. During 1987, we witnessed an abrupt and extraordinary reversal of this pattern, with prices actually **rising** (for the first time in a decade) and supply falling at the same time.

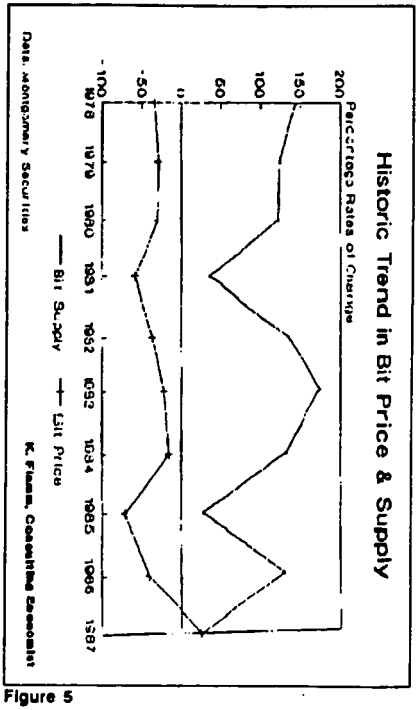


Figure 5

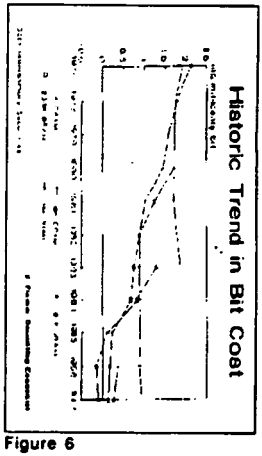


Figure 6

The transition from 256K parts to higher density 1 meg parts also occurred in a way that was quite different from the historical pattern. Typically, prices for the new, higher density part fall faster than prices for the more mature product. Thus, even though both sets of prices are falling, the cost per bit of the newer DRAM eventually falls below that for the older product, and the intergenerational transition occurs. (See figure 6.) In 1987, however, we witnessed an extraordinary new pattern of transition (see figure 7). Price per bit for both the old and new generation parts actually increased, with the old part's price jumping up so much more rapidly than the new part, that the transition became economic. Again, this

seems to be a new phenomenon.

Even the structure of DRAM prices in the marketplace seems to have diverged quite strongly from the historical pattern. Over the last year, we have become accustomed to spot prices that are double, triple, even quadruple long term contract prices. In past periods of tight demand, on the other hand, available data suggest that no such extraordinary differentials have existed. It has frequently been pointed out that lead times for DRAMs in 1984 greatly exceeded lead times during much of 1988, in order to argue that the current shortage is no more severe than the 1984 scarcity. [4] But even at the peak of the 1984 boom, nothing like the current pricing structure existed. Figure 8 displays what are probably the only reliable data on pricing structure in the DRAM marketplace based on actual transaction prices, supplied by chip producers and importers in response to surveys by the U.S. International Trade Commission for its investigation into dumping of 64K DRAMs.[5] The data distinguish between spot, authorized distributor, and direct computer OEM distribution channels, and by size of transaction. As is evident, spot prices for low volumes were rarely much greater than large volume, OEM contract prices, and never multiples of these, even at the height of the 1984 shortage. And the overall impact of the 1984 shortage was not to increase chip prices in absolute terms, but instead to moderate what would otherwise have been a much sharper decline.

Finally, one must note that "normal" economic models of supply and demand in the industry constructed by U.S. industry insiders (often with privileged access to investment and capacity data) have been dead wrong in their predictions over the last year or so. One frequently cited study, for example, concluded that:

> The tight supply conditions seen in late-1987 [are] only temporary. Several firms have just begun full-scale production and others will soon follow in the first half of 1988. Thus, throughout most of 1988, potential supply capacity will ramp faster than demand under any plausible market scenario.[6]

This view was widespread among American semiconductor forecasters through the spring of 1988. It conflicted sharply with the consensus view in Japan, where semiconductor manufacturers predicted a shortage lasting at least until the

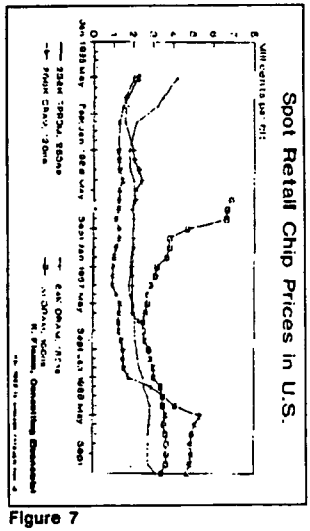
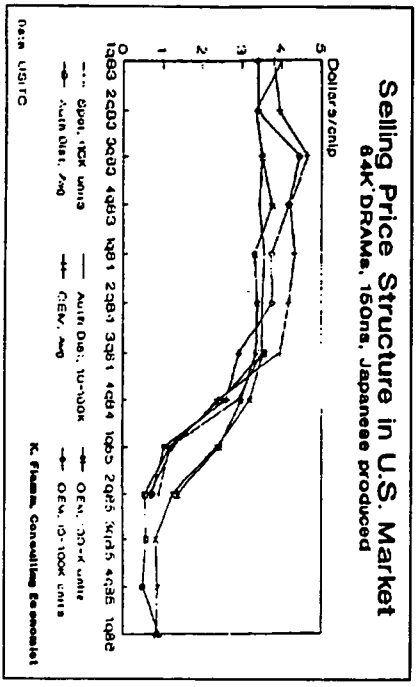


Figure 7

[5] Price differentials and pricing patterns over time for U.S.-produced chips do not differ significantly from those for Japanese chips.

[6] Finan and Amundsen, quoted in SIA, **One and One-half Years of Experience Under the U.S.-Japan Semiconductor Agreement** (Cupertino, CA: SIA), March 1, 1988, p. 26.



spring of 1989.[7] Quite clearly the American models were wrong, and the Japanese insiders were right.

The events of 1987 were to raise even more questions about whether strange new things were going on in the marketplace. An alert reader of the trade press would soon catch many hints that governments were involved in some unorthodox new policies with major impacts on the industry.

The chip cartel in 1987. The fact that the extraordinary market conditions of 1987 and 1988 followed the conclusion of the Semiconductor Trade Arrangement (STA) in Japan in September, 1986, naturally leads one to explore a possible connection. It seems reasonably clear, in retrospect, that the Japanese chip industry was organized by Japan's Ministry of Trade and Industry (MITI) to act as a cartel in response to the STA. It is also clear that MITI's actions were at least in part encouraged by the United States government. It is put most baldly by last year's keynote speaker, Clyde Prestowitz, in his recent book when he writes of the U.S. objective: "This amounted to getting the Japanese government to force its companies to make a profit and even to impose controls to avoid excess production-- in short, a government-led cartel. For the free-traders of the United States to be asking Japan to cartelize its industry was the supreme irony. Yet it was logical."[8]

Explicit recognition of a MITI role in controlling production and exports of DRAMs was granted in a confidential memorandum to the July 31 agreement[9] between U.S. and Japanese negotiators. In a confidential memorandum of August 1, initialled by U.S. and Japanese trade negotiators, MITI agreed to take appropriate action to control the volume of exports of 256K DRAMs from Japan to the United States over the July 2 to September 15 period, and to see that shipments took place at the "normal shipment rate". MITI also expressed its readiness to devise the necessary legal or administrative procedures to control shipments as soon as possible. Indeed, those administrative procedures were put into place in record time. On September 30, 1986, MITI issued its first Supply-Demand Forecast

[7] See Mitsuhiro Takahashi, "Producers slow to react to chip shortage," **Japan Economic Journal** (an English language business weekly drawing on reporting in its Japanese language parent, the **Nihon Keizai Shimbun**, Japan's rough equivalent of the **Wall Street Journal**), May 7, 1988, p. 1.

[8] Clyde V. Prestowitz, Jr., **Trading Places**, (New York: Basic Books), 1988, p. 62.

[9] Though the STA was formally signed on September 2, 1986, it was negotiated and an agreement reached at the very end of July.

(after receiving comments from a newly established Semiconductor Supply-Demand Forecast Committee) and has issued such a forecast every quarter since then. In October of 1986, MITI followed up with the establishment of a special Semiconductor Monitoring Office to administer its implementation of the STA.

U.S. Commerce Department officials apparently had hoped for substantial production cutbacks in Japan, but those hopes were initially unfulfilled,[10] as some companies-- particularly TI Japan and NEC (then the largest Japanese producer of 256K DRAMs)-- appeared reluctant to follow MITI's "guidance" on production and export volumes.[11] (The forecasts for those first quarters tended to be significantly below actual production, and forecast errors much larger, than in later quarters.) U.S. merchant semiconductor producers complained bitterly that Japanese producers continued to export DRAMs to third-country markets at prices substantially below the newly-devised Fair Market Values (FMV's) established by the Commerce Department for U.S. imports of Japanese chips.

On February 18, 1987, MITI took the unusual step of revising its December "forecast" downward. (This is the only time to date when MITI has issued a mid-quarter revision to the Supply-Demand forecast.) The official reason for the revision given on the Forecast was that "the exportation of those products remained small and domestic demand remained sluggish".[12] But MITI officials made it quite clear in open discussions with the Tokyo press corps that the revised Forecast "sends a strong signal of MITI's desire," and that MITI was issuing "administrative guidance" to Japanese chip producers to cut back production with the forecasts.[13] The MITI spokesman was quoted as saying that "we don't punish people if our expectations aren't met, but I am sure it will play a role as a production guideline".[14] Yukio Honda, director of MITI's Industrial Electronics Division, even told **Electronic News**' Tokyo reporter that MITI's administrative guidance to producers had been cleared with the Japan Fair Trade Commission.[15]

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[10] See John Sullivan Wilson, "The United States Government Trade Policy Response to Japanese Competition in Semiconductors, 1982-1987," draft prepared for the Office of Technology Assessment, September 1987, p. 119.

[11] The **Japan Economic Journal** (April 4, 1987) reported that "while the Government has asked Japanese microchip makers to curtail production to help alleviate the chip trade dispute with the U.S., NEC did not comply with the call until February, saying that the domestic market had no oversupply of memory chips". By March of 1987, TI Japan was apparently the lone holdout against production cutbacks among Japanese DRAM producers. See Robert Ristelhueber, "TI Speeding Up U.S. DRAM Output," **Electronic News**, April 20, 1987, p. 6.

[12] "Revision of the Semiconductor Supply-Demand Forecast," (Tokyo: MITI), photocopy, February 18, 1987.

[13] See the Kyodo News wire report of February 18, 1987; Peter Waldman, "Japanese Chip Firms Told to Cut Output 10% as U.S. Deadline on Accord Nears," **Wall Street Journal**, February 19, 1987, p. 6; A.E. Cullison and Rose A. Horowitz, "Japan Presses Chip Makers to Cut Back on Production," **Journal of Commerce**, February 19, 1987, p. 1; "Japan Asks 10% Cut in Chip Output," **New York Times**, February 19, 1987. The **Wall Street Journal** article quoted Japanese chip executives as suggesting that MITI was acting less to save the STA than to reduce the impact of the ongoing recession on Japanese firms.

[14] Waldman, "Japanese Chip Firms Told...".

[15] Minoru Inaba, "MITI Sets DRAM/EpROM Cuts," **Electronic News**, February 23, 1987.

At least some U.S. officials involved in the chip negotiations welcomed MITI's actions. Quoting one such anonymous official, the **Wall Street Journal** reported that "the U.S. has resisted telling Japan how many chips it thinks Japanese producers should be making because of the issue of sovereignty, but the official conceded that MITI's production guidelines 'could potentially be helpful' in driving up Japanese prices around the world."[16]

It was too little, too late, however, to stave off U.S. retaliation on the third-country exports issue. By early March of 1987, a sub-cabinet group within the U.S. government had agreed to press for sanctions on Japanese imports as a punitive measure, and by late March these had been announced.

With further U.S. actions imminent, MITI applied new pressures to the Japanese industry to get them to toe the line on exports to third country markets. MITI ordered further production cutbacks by Japanese producers, and began to use more stringent export licensing procedures as the lever to force compliance. These events were reported in the U.S. trade press, since MITI openly pointed its finger at Texas Instruments for not following MITI guidance, and Texas Instruments-- which produced much of its DRAM output at its Miho, Japan fabrication line-- responded by declaring to the press its willingness to comply with demands made on it by MITI. On April 6, 1987, **Electronic News** reported that MITI had on two occasions thus far in 1987 requested Japanese firms to cut DRAM output, and that TI Japan would slash its output of 256K DRAMs by 13 percent in order to comply with MITI wishes. Asked to respond to MITI's contention that TI was resisting its requests, Ramesh Gidwani, a TI group vice president answered: "We have been asked to reduce production, and we are complying. Does that sound like we are resisting?"[17] TI President Jerry Junkins declared to a stockholders meeting: "Although we are responding to this Japanese directive, we do no believe that cutting production, with the attendant risk of creating an artificial shortage, is the correct approach."[18]

Although MITI apparently had no legal power to order firms to follow its administrative guidance and reduce production or exports, it could effectively pressure firms by using its administrative power over the export control apparatus. The threshold value of DRAM export shipments requiring a license was lowered from 1 million yen to 50,000 yen, and long delays followed for firms not complying with MITI's suggestions on production, exports, or pricing.[19]

MITI's February forecast revision was followed by further administrative guidance in the form of its regular second quarter forecast issued on March 23, 1987. The anguished screams of U.S. users in February and early March protesting cutbacks in Japanese exports led MITI to be much less public about the precise nature of its actions, but the Japanese press and industry clearly regarded the

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[16] Waldman, "Japanese Chip Firms Told...".

[17] See "TI Japan to Cut Output of 256K DRAMs by 13%," **Electronic News**, April 6, 1987, p. 4.

[18] Ristelhueber, "TI Speeding Up...", p. 6.

[19] TI Japan, for example, was reported to be experiencing long delays receiving MITI export approvals. A spokesperson was quoted as saying that TI "didn't know if the delay was intentional or not." See Jack Robertson, "Japan Export Delays Draw Fire From U.S. Makers," **Electronic News**, April 6, 1987, p. 4. A frank discussion of the use of export licensing procedures to control export prices may be found in Mikio Fujiwara, "This Is a Side Letter to the U.S.-Japan Semiconductor Agreement," **Bungei Shunju** (in Japanese), May 1988, pp. 124-137. The author, an executive in a Japanese semiconductor firm, used a pseudonym in writing this article.

forecasts as continued orders from MITI.[20] Chip makers complained to the Japanese press about the impact of uncertainty in predicting MITI's administrative guidance for the next quarter in developing their production programs. By early April, prices for 256K DRAMs had begun to rise in Japan despite complaints from Japanese users; a trading firm representative said "we have to accept the new prices because of the direct guidance of MITI".[21]

The June and September forecasts continued to serve as guides to the Japanese industry.[22] In early September, both Toshiba and Hitachi publicly confirmed that they had also been scaling back production of 1 megabit parts in response to guidance from MITI. A MITI spokesman in Washington responded that it set "no limitation or guideline to the electronic industry"; a Toshiba representative in Tokyo clarified that by adding that "Toshiba-Tokyo took serious consideration of the MITI demand forecast and judged it should change its own manufacturing schedule and plan".[23]

By September, markets for chips had tightened substantially overseas, and MITI issued a third quarter forecast which considerably increased exports of DRAMs. By this time, MITI restrictions on supply were developing into a major problem for U.S. consumers, and the U.S. government responded to these mounting pressures. On November 3, a carefully timed ballet of communiques occurred. The Department of Commerce first announced that it had ascertained that "third-country dumping" had ceased. A little later that same day, MITI welcomed the Commerce announcement and itself issued a carefully worded statement claiming that it was imposing no controls. Still later on November 3, the President issued a statement from the White House announcing the partial suspension of sanctions related to "third-country dumping".

The finely-tuned wording of the MITI statement was worthy of special note: "MITI is imposing no quantitative or other restrictions the production, shipment or supply of semiconductors, except MITI continues to exercise export control from the view point of COCOM. If any short supply arises under the sharp increase of demand, it should not be attributed to MITI."[24] The wording is notable in at least three respects. First, it makes no disavowal of past actions prior to November 3. Second, MITI explicitly exempts export control procedures from its disavowal, and as was noted above, the export control procedures were a major mechanism of its policies to restrict supply. And third, the disavowal repeats earlier disavowals of "imposing restrictions," but does not speak to the issue of whether non-binding, extralegal MITI "guidance" or "suggestions" or "forecasts" which are taken as targets by cooperative chip manufacturers serve a restrictive function.

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[20] See "MITI Orders Lower Chip Output," "Trade Woes, MITI, Recession Short Circuit Chip Production," **Japan Economic Journal**, April 4, 1987.

[21] "MITI-ordered Production Cutbacks Raise Local Prices of 256K DRAMs," **Japan Economic Journal**, April 18, 1987.

[22] See "Japan to Raise Output of 256 Kilobit DRAM by 10%," Kyodo News wire dispatch, June 24, 1987, which reports that MITI officials "instructed" Japanese chip makers to increase production of 256K DRAMs, and quotes them as saying that the Ministry would "allow" the growth in responding to an increase in overseas demand.

[23] Rufus Baker, "Toshiba Cuts 1-Mb Chip Ships," **Electronic Buyers' News**, September 14, 1987, pp. 1, 80.

[24] "Statement of Ministry of International Trade and Industry Concerning Trade in Semiconductor," MITI, November 3, 1987.

Two key points emerge from the historical record of MITI's interventions through November of 1987. First, whether or not it was issuing orders in the formal, legal sense, MITI clearly had organized a de facto cartel among Japanese manufacturers in 1987. Second, at least in the initial stages, this was encouraged by some within the U.S. government.

Overall, the government officials controlling the negotiation process appear to have been responding explicitly to the pleas of the American merchant semiconductor industry, and following its agenda, not developing some broader and independent conception of the national interest and a U.S. semiconductor policy tailored to this broader view (and this is not said pejoratively, since that is how the trade policy process is set up at present in Washington). Though the Semiconductor Industry Association was to later raise its voice in protest against the production controls in solidarity with embittered American chip users when their existence became apparent, it is hard to understand how the initial impulse which encouraged MITI to pursue that path could have developed on its own within the government. Perhaps someone's memoirs will ultimately reveal what went on behind the scenes when the U.S. negotiating position was set; to what extent the American position was cleared by the trade negotiators with the SIA, and to what extent officials improvised their own script.

MITI and Strategic Behavior Since November 1987. MITI's public disavowal of the imposition of restrictions on production did not end discussion of its role in determining semiconductor supply. In early January of 1988, a sudden and discontinuous increase in DRAM prices occurred, a rise that was to continue throughout that quarter. A large differential between DRAM prices in the U.S. and Japanese markets seems to have appeared, and the existence of this widening differential– inconsistent with the working of an open and competitive market– led to much continued discussion of MITI's role.

The evidence for the existence of this cost differential consists of two bodies of information. First, numerous reports have appeared in the Japanese trade press describing such a differential.[25] Second, published data on Japanese and American chip prices indicate the appearance of a large differential in early 1988. Figure 9 graphs time series on wholesale Japanese DRAM prices quoted in **Nihon Keizai Shimbun**, and the price charged by the largest U.S. retailer. The U.S. price series may be considered reliable since it moved quite closely with the most comprehensive data available on historical U.S. chip prices, surveys undertaken by the U.S. International Trade Commission in the course of its dumping investigations. Since we are comparing a retail price with a wholesale price, we have

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[25] For example, on April 9, 1988, the **Japan Economic Journal** reported that Korean chip exports to Japan had dropped steeply, because Korean producers had found prices and profitability greater in the U.S. market. Noted the **Japan Economic Journal** (on p. 4): "The reasons for the shift are obvious. With Japanese semiconductor exports to the U.S. down sharply as a result of increased trade friction between the two nations, prices on the underfed U.S. market have begun to skyrocket...At the same time, though supplies in Japan were also dwindling, Japanese companies were reluctant to accept price hikes beyond the typical Y 340 cost for large users. Not surprisingly, Korean makers moved quickly to enter the more lucrative U.S. market."

On July 18, 1988, **Nihon Keizai Shimbun**'s morning edition carried a front-page story reporting that the price *differential* between the Japanese and foreign market for a 256K DRAM had widened from 100 yen, as trade friction heated up, to 200-300 yen. (An English language summary of the story was carried in the **Japan Economic Journal**, July 30, 1988, p. 10. Note that depreciation of the dollar makes the dollar value of that change in the differential substantially greater.) On August 20, 1988, **Nihon Keizai**'s morning edition carried a story on page 18 reporting that Japanese semiconductor producers had begun stepping up exports, with much higher price tags than these products carried in the domestic market. (English language summary in **Japan Economic Journal**, August 20, 1985, p. 15. The story also notes that observers feared this might exacerbate shortages in the domestic market.)

indexed both prices in Figure 9 to May of 1985. The two sets of prices move together quite closely until early 1988, at which time a large differential appears.

A differential between the two markets could clearly not exist in an open, competitive market. In such a free market, arbitrageurs would purchase cheaply in one market, sell dear in the other, and eventually eliminate the differential. The fact that such a differential has persisted suggests that forces other than Adam Smith's invisible hand are at work.

The speculation was encouraged by MITI's continuing propensity to issue quarterly forecast reports. During the pre-November reign of relatively public MITI controls on production, it did not seem extraordinary that the "forecasts" issued for DRAM production levels three and six months out should typically fall within 10 percent of actual output, as shown in figure 10 and 11. (For 1 megabit DRAMs, with production dominated through most of this period by just one producer, Toshiba, the error was more typically on the order of 2 percent.) The "forecasts" were obviously much more than that, and the rather dismal record of the American chip forecasters (discussed earlier) might be explained as normal (and usually very large) forecast error compounded by the utilization of models relying on past historical relationships even as a new and quite different chapter was in fact being written in this industry's history.

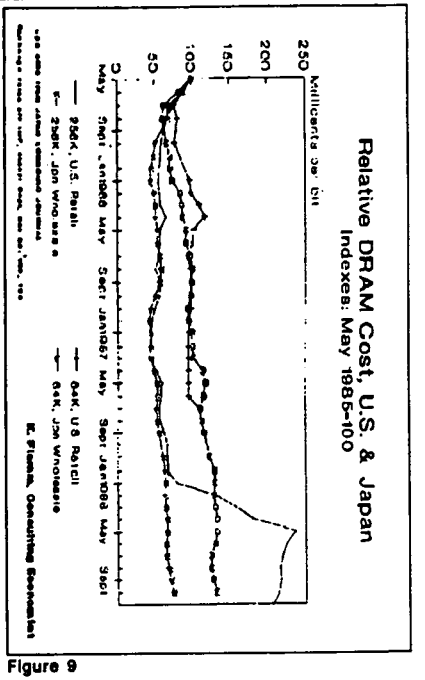

Figure 9

The truly noteworthy feature of the post-November DRAM production forecasts is that they continued to be extraordinarily accurate, **after** MITI claimed to be letting the invisible hand, rather than its own, run the market. Indeed, at least one explanation offered in early 1988 for the unprecedented jump in chip prices clearly flew in the face of the forecasts' accuracy. Many argued that unexpected yield problems were a major reason for the shortage. But if true, problems with yields could only have been unexpected **more** than six months earlier, when the forecasting dart that hit the reality bullseye on the two quarter ahead forecasts was first launched. Since six months is about what it might take to add capacity at an existing plant,[28] mistaken long-term expectations about yields could have been compensated for by adjusting investment and utilization rates to achieve desired production targets. On the other hand, if errors in short-term forecasts for yields were what was unexpected, it is equally difficult to understand the extremely accurate one quarter production forecasts. Adjusting production scheduling in mid-quarter to

[28] Indeed, NMB Semiconductor claims that it took only nine months to go from initial ground-breaking on a completely new fabrication facility to initial production of 256K DRAMs back in 1985. See Larry Waller, "DRAM Users and Makers: Shotgun Marriages Kick In," **Electronics**, November 1988, p. 30.

compensate for short-term yield problems and still hit the three month forecast would be most difficult, since manufacturing time from starting a silicon wafer on the line, to a finished chip, is typically 45 to 60 days.[27] Thus, though yields were undoubtedly low in the initial stages of 1M DRAM production (as has been true for every other generation of chip), it is hard to see how big surprises in yields can be reconciled with the pinpoint accuracy of the MITI production forecasts. Since you are the real experts, I hope that you can enlighten me.

By the spring of 1988, however, accurate forecasting of production levels had clearly become a much less mysterious affair. By virtually all accounts, DRAM manufacturing lines in the U.S. and Japan had ramped up to maximum output, to take advantage of the enormous profits to be had. Indeed, SRAMs too began to rise in price, as some producers switched some of that capacity to more profitable DRAM production. Simple calculations of DRAM capacity, coupled with decent predictions of yields, would produce tolerably decent one quarter forecasts. Accurate longer term forecasts would depend on knowing what capacity would be installed in future quarters. And any attempt to guide production would boil down to controlling new investment.

At that point a new mystery was to appear. Faced with what were probably the most elevated levels of profitability in the history of the industry, due to a shortage which the Japanese consensus held was likely to last at least through early 1989, investment in new capacity by Japanese producers was remarkably sluggish. Indeed, when compared to boom years of the past, chip plant and equipment investment was at a historic low when compared to sales. When I spoke with Japanese security analysts in March of 1988, reports were circulating in Tokyo that Japanese semiconductor manufacturers were quietly submitting their investment plans to MITI for informal review, and that MITI was playing some role in restraining investment. (Such quiet intervention would be difficult to detect, since chip makers have long been asked by MITI to provide

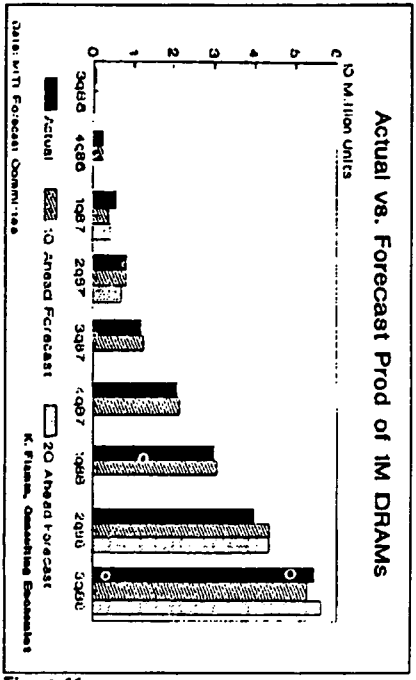

Figure 11

[27] The "unexpected yield problems" thesis attained its most extreme form in the assertion that the earthquake that Japan suffered on December 17, 1987, by shaking up chip plants and yields, was a proximate cause of the price surge of early 1988. It was given wide circulation by George Gilder in an article in the **Forbes** of June 13, 1988 (See "How the computer companies lost their memories", p. 81). MITI's Forecast Committee actually met on December 15, two days **before** the big earthquake, to discuss DRAM production during the first quarter of 1988. The forecast was extremely accurate: actual production fell short of the forecast by -1.9 percent for 64K parts, -7.7 percent for 256K parts, and -1.9 percent for 1 Meg parts.

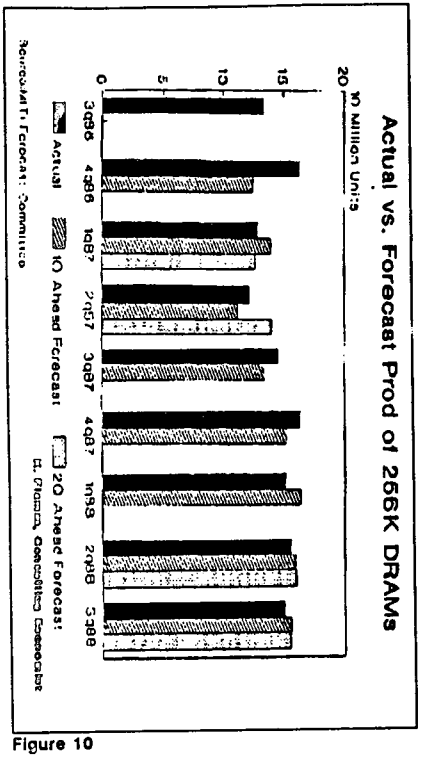

Figure 10

data on their investment plans.) The Japanese trade press began to routinely print analyses suggesting that manufacturers were acting much more collusively than in the past, that firms were consciously acting with restraint in order to increase profitability for the industry as a whole, rather than each firm increasing production in an attempt to increase its share of these windfall profits (as in a competitive market).

For example, a May 9 analysis in the **Japan Economic Journal** gave 3 reasons for the sluggish investment in chip production. Said the reporter: "...one reason is the fact that manufacturers are loathe to repeat the debacle of 1984-85 [when demand shrank drastically after buildup in capacity]. Another reason is the fact that Japanese semiconductor makers are making comfortable profits from the present arrangements based on the Japan-U.S. semiconductor agreement signed in the autumn of 1986 at the urging of the Ministry of International Trade and Industry. Production cutbacks enforced by the agreement have sharply boosted the market prices of semiconductors and Japanese manufacturers **have come to value profits more than market shares** [my emphasis]. A third reason, on the other hand, is Japanese manufacturers' fear that any large-scale equipment investments will rekindle trade friction with the United States."[28]

These two themes-- restraint in investment, linked in part to MITI attitudes, and more oligopolistic behavior ("profitability instead of market share" were to surface often in Japan over succeeding months. The **Japan Economic Journal** ran an editorial on May 28, for example, that noted: "It is unnecessary to note that semiconductor manufacturers are aware that the government's supply-demand forecasts mean nothing less than quantitative production controls, though the ministry takes the position that it is simply one of the many forecasts it routinely employs. Similarly, the legality of the government's semiconductor export price monitoring system is also ambiguous. There is no doubt that the monitoring of exports by the overseas subsidiaries of Japanese semiconductor manufacturers has no legal justification."[29]

An article in **Nihon Keizai Shimbun** on June 8, 1988, further elaborated. "The silicon cycle has completely come undone. The reason for this is the constraint on investment on the part of

[28] Takahashi, "Producers slow to react...," p. 10.

[29] "Editorial: Scrap the chip pact," p. 22.

semiconductor makers, done in the name of 'cooperation.' Koji Kobayashi, chairman of NEC asserts that 'The semiconductor manufacturers will not let the tragedy of 1984 happen again...According to one of the top men at a leading chip manufacturer, 'I would not want this to be construed as a cartel. Manufacturers have become more open in sharing information, so that there is more coordination. In the old days, we used to send industrial spies to gather information about the activities of our rivals, but recently, that practice has vanished.' For example, Toshiba announced that 'Mass production of the next-generation 4 megabit chips is not planned for his year, and we can not predict when it will start'. Such openness should dispel any lack of trust within the industry and is related to efforts to keep excessive competition under control...It does not appear that the chip makers' move away from memory chips and their cooperative efforts to avoid excessive competition are temporary phenomena. The shortage of memory chips is thus expected to continue for a long time."

The same themes were echoed in an August 13, 1988 article in the **Japan Economic Journal**. After noting that capital investment in fiscal 1988 was expected to reach 430.8 billion yen, compared with 762.8 billion yen during the boom year of fiscal 1984, the reporter quoted Yukio Honda, director of MITI's industrial electronics division: "This figure mirrors the manufacturers' prudent stance toward capacity expansion for fear of another recession in the future." The article continued: "Chip makers have long been vying for larger market shares, as mass production leads to remarkable cost reductions. Manufacturers embarked on capacity expansion in peak years which repeatedly caused overproduction and a resulting recession. Any coordinated action among manufacturers was unthinkable. But after the 1986 Japan-U.S. chip pact, MITI led the manufacturers to reduce IC production by about 30% in early 1987. 'The pact helped to virtually create a coordinated production control by chip makers that we have never seen before,' a broker said...The Japan-U.S. microchip agreement so far has failed to achieve improved access for U.S. semiconductor makers to the Japanese market. But it seems certain that the pact helped Japanese chip makers strengthen their profitability through production controls."[30]

An editorial in the same issue mentioned explicitly mentions the existence of investment controls: "While the Japanese government was busily setting up an export price monitoring system and instituting a series of production, and plant and equipment investment controls, the demand from Japanese and American semiconductor users rebounded sharply."[31]

Japanese security firms in Tokyo also continue to stress both trend toward more oligopolistic behavior in the chip industry and the government's role in encouraging it. Nomura Securities echoed the familiar "profits instead of production volume" theme in a September 1988 analysis: "In addition, equipment investment for research and development in this area involves major risks. This leads to an oligopolistic market, in which a few major firms dominate. The top Japanese firms tend to benefit from this kind of a situation. Moreover, the Japanese-U.S. treaty on semiconductors-- which is expected to be amended slightly-- is seen as bringing about a stabilization of prices and should contribute to ensuring sustained profit earnings. The switchover from policy of expanding production volume to a situation where management places an emphasis on profitability will also contribute to market stability."[32]

The same rhetoric was repeated in a conversation I had with an official in MITI's industrial electronics division on September 26. After a long and inconclusive discussion of what sort of exchanges between MITI and the Japanese industry might be considered "controls" or "guidance" or

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[30] Shigehisa Shibayama, "Chip shortage expected to last through '89," **Japan Economic Journal**, August 13, 1988, p. 5.

[31] "Editorial: Chip pact obsolete," **Japan Economic Journal**, August 13, 1988, p. 22.

[32] The Nomura Securities Co., Ltd., "Economic Insight," **Japan Times**, September 17, 1988, p. 9.

even "suggestions," I was told by the official that it was the position of the Japanese government in general, and MITI in particular, to encourage chip firms to stress profitability instead of market share.

In the late summer and early fall of 1988, the major Japanese chip producers ultimately announced upward revisions of their capital spending plans.[33] Even after those revisions, however, capital spending is far (about 40 percent) below outlays during the 1984 boom in absolute terms, despite the substantial growth in both the sales base and in the cost of equipment. An October estimate from Nomura Research forecasts fiscal 1988 spending on capital equipment by Japanese chip companies as a fraction of sales up somewhat over 1987, but well short of pre-STA spending levels (see figure 12). Furthermore, a significantly smaller proportion of this equipment investment is going into DRAM capacity than was the case during the last boom period.[34]

In December 1988, Barclays de Zoete Wedd's Tokyo office released a research report on the Japanese semiconductor industry which contained a particularly frank assessment of the future outlook. "On the political front, we expect the U.S. to exert continued pressure on Japan to monitor pricing. We also expect MITI to use its influence to an unprecedented degree to regulate the industry in order to prevent both a major slump and trade conflicts with the U.S. MITI's regulatory moves will likely come in the form of behind-the-scenes guidelines for producers and may be extensive in scope. We expect the measures to be reflected clearly in the production levels of the major Japanese makers. The result should be better-coordinated production with pricing closer to, but above the production costs of the high-cost producers such as Sharp and Sanyo."

"Although we expect coordination among Japanese makers to develop under some form of behind-the-scenes guidelines from MITI, we do not expect a price cartel that would maintain prices substantially above production costs. If prices are kept too high, foreign competition may become a problem...In a free market, we would expect prices to come down to the marginal cost of production, i.e., to closely follow the cost line...However, as we are anticipating some form of price control or production coordination, prices are likely to be set above the cost line. Thus, we believe that manufacturers will be able to maintain some 20%-25% gross margins and estimate that after prices drop to a level nearer to cost, they will move toward the cost level only gradually."[35]

Finally, in discussing MITI's possible role in organizing behind-the-scenes cooperation or collusion among Japanese companies, it is important to note that there is a long tradition within Japan in general, and within MITI in particular, of encouraging the formation of cartels to avoid "excessive competition".[36] This has been particularly true for capital-intensive industries, like steel or chemicals (or semiconductors today!), where it was thought that unrestricted competition would lead to excess capacity. Top officials and well-known academics defined this position and gave it an intellectual

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[33] It should also be noted that some specialists in Japan claimed that the investment plans publicly announced by semiconductor companies exceed actual investments by a significant amount. See "Chips in Short Supply," **Tokyo Business Today**, September 1988, p. 9.

[34] This was confirmed in my discussions with the MITI official on September 26.

[35] Barclays de Zoete Wedd Research, **Japan-- Electronics, Semiconductors**, (Tokyo: Barclays de Zoete Wedd), December 1988, p. 12.

[36] Indeed, quite apart from collusion proposed or administered by government agencies, private industry associations routinely serve as the forum for the exchange of an enormous range of information, and discussions of business strategies, that would be unthinkable in the United States because of much stricter attitudes toward antitrust issues.

foundation.[37] During the 1950s and 1960s, intervention by MITI in the form of legal cartels or more informal guidance to coordinate investment decisions, restrict price competition, or allocate production, was widespread.

Since the 1970s, this type of action by MITI is thought to have become much less frequent. The number of legal cartels has declined, there have been an increasing number of legal challenges to MITI's ability to organize more informal modes of collusive behavior, and the antitrust law was strengthened substantially in 1977. Still, MITI continues to openly coordinate a number of legal cartel arrangements, particularly in chemicals (ethylene, for example), and to offer administrative guidance to Japanese industries. Though the frequency of such state-sponsored collusion may have declined, the concepts remain entrenched in the bureaucracy and the society.

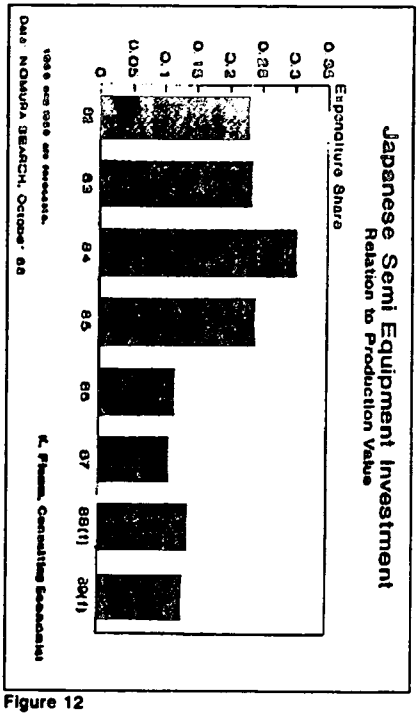

Figure 12

MITI's ability to organize chip makers in such enterprises is enhanced by the strong historical links between industrial policy in semiconductors and computers in Japan. MITI policies to promote semiconductors have always been aimed at computer systems end markets. An anonymous executive in the semiconductor division of one of these Japanese companies succinctly explained the political and cultural leverage MITI brings to bear: "... the six large semiconductor manufacturers in Japan have the strange nature that they are under MITI's thumb or they meet every wish of MITI. The six large manufacturers are Hitachi Ltd., Toshiba Corporation, NEC Corporation, Fujitsu Ltd. and Oki Electric Industry Co., Ltd. They are large manufacturers of semiconductors as well as computers. Historically, MITI's promotion of the industries of computers and semiconductors used for them was made simultaneously. The fact that the same manufacturers and same officials of MITI make a group naturally brought forth a cozy relationship among them, and manufacturers can never be able to contradict MITI, because they thought they were under the care of it during the initial stage of these industries. The lower echelon of officials (Hancho) of MITI in their early thirties called presidents and senior managing directors of large manufacturers to come and told them to do this and that. This nature still remains in these industries."[38]

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[37] See Miyohei Shinohara, **Industrial Growth, Trade, and Dynamic Returns in the Japanese Economy**, (Tokyo: University of Tokyo Press), 1982, pp. 21-53; Kozo Yamamura, "Success That Soured: Administrative Guidance and Cartels in Japan," in K. Yamamura, Ed., **Policy and Trade Issues of the Japanese Economy**, (Seattle: University of Washington Press, 1982).

[38] Fujiwara, "This is a Side Letter..." (in Japanese).

In short, we know the following: in 1987, MITI certainly played a major role in organizing production cutbacks by the Japanese semiconductor industry, though it was to later deny such activities in carefully phrased communiques.[39] Though some Japanese semiconductor firms may initially have been reluctant to go along, this coordination turned out to be quite profitable for all involved. The STA may not have "caused" this initial run-up in DRAM prices, in the sense that the required market power-- the fact that four of five firms controlled 80 to 90 percent of the world merchant DRAM market-- preceded the STA.[40] But the STA appears to have been the precipitating factor which put MITI in the position of organizing and enforcing joint collusive activity on the part of these firms.

The "word on the street" in the Japanese financial community in 1988 was that MITI continued to play a behind the scenes role in cooling new plant and equipment investment, despite chip lines that were reportedly running all out at full capacity and the most profitable market conditions in the industry's history for DRAMs. None of this constitutes concrete proof of cartel behavior, of course. Indeed, the only objective, measurable indicators supporting the thesis of highly imperfect competition in this market is the widening price differential between the Japanese and American markets for DRAMs, and the fact that MITI continues to exercise tight control over sales of DRAMs to foreigners.[41]

III. Industry Agendas and the National Interest

Should we be concerned about all this? Chip manufacturers, though concerned about their continuing difficulty in increasing market share in Japan, have vigorously defended the STA. Certainly there has been some increase in U.S. chip sales in Japan as a result of the agreement. The limited number of American producers of DRAMs certainly seem happy enough with their limited share of the profits created by the jump in prices, though one might ask how sustained that satisfaction will be as the huge profits reaped by their Japanese competitors are plowed back into research and investment in the next generations of products they will be facing in the marketplace.

I would imagine the picture is considerably more mixed from the viewpoint of materials and equipment manufacturers, who surely realize that policies that reduce chip production reduce demand for their products. On the other hand, some of you may argue that the fortunes of the American equipment industry are linked to the fortunes of the American chip industry in the chauvinist, nationalist world we inhabit. In that case, the question comes back to how much benefit semiconductor producers

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[39] Some of MITI's denials can only be true if extremely tiny hairs are split over wording and semantics. This is clearly illustrated in the continuing public denial by MITI officials of the existence of secret side letter proposing a target for U.S. chip makers of 20 percent of the Japanese market. See **Journal of Japanese Trade and Industry**, No. 6, 1988, pp. 30-31. A photocopy of this letter was actually reproduced in the Japanese magazine **Bungei Shunju** in May 1988.

[40] Indeed, in EPROMs, the other dumping case which was suspended with the STA, a handful of Japanese firms did not dominate production, and prices did not rise in the same fashion.

[41] Foreigners wishing to purchase DRAMs from Japanese vendors are reportedly required to register with MITI; MITI will not consider issuing an export license to a Japanese vendor until such an application has been approved. The policy appears to result in tight control over the ability of foreigners to gain access to the Japanese DRAM market. From personal experience attempting to purchase DRAMs on the retail market in Japan, in March and September of 1988, in the Akihabara in Tokyo and Den-Den Town in Osaka, I can report that no retail outlet appears willing to sell DRAMs to an obvious foreigner walking in off the street. When questioned on this point, a MITI official suggested that the vendors may have been concerned about export licensing requirements.

are likely to receive.

The picture is considerably different for the American computer industry, the huge dog being wagged by its semiconductor-producing tail. The health of the American computer industry is central to our national interest. With U.S. computer shipments approaching two percent of GNP, just one year's technological advance in hardware (which leads to a monotonously high improvement in price performance of about 20 percent annually) translates into an improvement in the American standard of living in the range of .5 percent of GNP. This is an extraordinarily large number when compared to GNP growth rates of two to three percent per year. Improvements in price performance slowed to a crawl in the computer industry in 1988, and one can discern some serious issues to be concerned about.

Profitability. Since 1987, DRAM cost has become a major factor in the profitability of computer system producers dependent on memory components purchased in the merchant market. The impact on profitability works through both direct and indirect channels.

Most directly, by driving up the price of required memory chip inputs, increases in DRAM price lead to price hikes for computer systems, along with reductions in profit margins reflecting that portion of the increase which is not passed on to buyers. Computer demand is highly price elastic-- i.e., all other things equal, a small price increase leads to much larger declines in demand. A number of economic analyses suggest a price elasticity of about -1.5: a ten percent cost increase leads to a 15 percent decline in computer demand. Assuming that DRAMs account for 10 to 15 percent of the cost of a computer, a ten percent increase in the cost of DRAMS would then lead to a 1.5 to 2.3 percent decline in computer demand.[42] These elasticity calculations are only accurate in approximating relatively small changes, but much larger price changes would be expected to lead to commensurately greater dips in demand. Thus, the recent run-up in DRAM prices-- perhaps 300 percent in the spot market, perhaps close to 100 percent in other distribution channels-- must certainly have led to a significant softening in computer systems demand relative to what might otherwise have been registered, and substantially diminished revenues and profits for systems producers.

More indirectly, high memory cost has reduced demand for new technology requiring significantly greater memory usage. The introduction of new technology has always been the tactic of choice for responding to the gradual erosion of profitability in more mature technologies which have diffused to low cost, low margin imitators. By slowing the pace at which adoption of new products becomes economically attractive, high memory cost has rendered existing computer product lines more vulnerable to attack by imitating competitors. More sophisticated-- but memory-intensive-- new products would be less vulnerable to cloning and copying.

Competitive Disadvantages. Thus, a general increase in the cost of memory spells diminished markets and profitability for computer manufacturers in general. It might be expected to have particularly negative repercussions for high technology companies counting on new, memory-intensive products to earn them significantly higher margins, and returns on their technology investments. It might be somewhat less painful for lower tech imitators, by prolonging the product life cycle for older vintage technology.

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[42] This follows from the fact that

$$E_{CPd} = E_{CPc} \times S_D$$

where E_{CPd} is the elasticity of computer demand with respect to DRAM price, E_{CPc} is the elasticity of computer demand with respect to computer price, and S_D is DRAM cost as a share of computer sales price. This approximation assumes that computers are priced at unit cost, and constant returns to scale in computer production.

However, it appears that the run-up in DRAM price has not affected all computer companies equally. In particular, the most important Japanese producers of computer systems are integrated producers of DRAMs, net sellers of the chips on the open merchant market. Their computer systems divisions almost certainly have access to the chips at a transfer price approximated by their cost of production, not the much higher sales price on the open market. These companies' computer divisions are then able to price below their foreign competitors, yet still remain highly profitable and increase their market share. There is some evidence that this has been happening: one market research study found a fifty percent increase in the market share of Japanese PCs sold through retail channels over the year ending in the first quarter of 1988. By late 1988, the number four vendor of PCs through resale outlets (but still trailing well behind the big three: IBM, Apple, and Compaq) was NEC.[43]

Even more interestingly, the cost advantage does not seem to be confined to Japanese chip producers. Rather, DRAM costs generally seem to have been maintained at a significantly lower level in the Japanese market than in the U.S. market. Thus, Japanese electronics producers, in general, with access to the Japanese chip market, seem to have a competitive advantage over foreign producers who lack such access.

American computer companies lose on all scores. They are vendors of new technology, not clones. Most do not manufacture DRAMs internally. And all except the largest have access to markets in the United States, not Japan manufacturer. So American systems houses will have to counteract some significant competitive disadvantages to stave off the effects of increasing Japanese competition.

The Trade and Investment Regime. Equally importantly, the fundamentals of the trade regime setting the rules of the game in which we play have changed significantly. The Semiconductor Trade Arrangement (STA) of 1986 has put into place a new system which effectively will administer prices-- outside the Japanese market-- for a host of key semiconductor products purchased by companies as inputs to their systems production. Chips specifically named in the agreement include not only memory chips of all sizes and types, but also ASICs and high performance logic chips. The STA gives MITI and the U.S. government the power to jointly administer floor prices for Japanese exports of these chips, without specifying precisely how these prices are to be set. Thus, pricing for a key input has become the object of a highly political exercise, in which effective lobbying and political deals are likely to be at least as important as economic logic. Furthermore, the language of the agreement is quite open-ended: virtually any chip can be added to the monitoring list unilaterally by either the United States or Japan, as long as one of two extraordinarily broad tests is met: that it be a "standard" part, or that suspicions of export at less than fair market value exist.[44]

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[43] NEC, with 5.1 percent of the market, trailed well behind number three vendor Apple (with 14 percent). NEC was closely followed by Hyundai (4.2 percent)-- also a captive DRAM manufacturer-- and Epson (4.1 percent). Leading Edge (selling a product manufactured by Korean maker Daewoo) and Toshiba led the next tier of producers. See Robert Faletra, "NEC, Epson Seen Vying for Second-Tier Spot," **PC Week**, January 2, 1989, p. 60; Steven Burke, "U.S. PC Firms Suffer as Japan Reigns Supreme in Memory-Chip Market," **PC Week**, June 7, 1988, p. 166.

[44] The relevant passage of the Semiconductor Trade Arrangement identifies two criteria for products to be monitored:

"1) they are standard and general use semiconductors, or 2)there is evidence of a threat of sales at less than fair value".

It goes on to state:

"Upon request of **either** government, new products can be added when they meet the above

A broadening of the scope of the agreement's implementation can already be discerned. Discussion with U.S. industry on pricing formulas for ASICs have intensified, and considerable momentum exists within the Commerce Department to pull in ASICs under the monitoring structure.

This move toward an administered pricing structure for Japanese semiconductor exports raises fundamental questions about our long term interests. At worst, supply and pricing for some of the computer industry's most important inputs are now the outcome of an intensely political process with many interested players, and over which a firm has limited control. Though the politics and pressures may have existed before, they are now institutionalized in an administrative structure granted new and sweeping powers that had no previous counterpart. And the U.S. computer industry has no guarantee that the outcome will not favor its growing Japanese competition in systems.

Strengthening the Competition. Finally, even if the Japanese chip/computer manufacturers were to not exercise their ability to act strategically to further their penetration into American computer systems markets, the extraordinary profits in DRAM manufacture would be a troublesome concern for our industry. Huge profits are clearly being made on DRAM sales, profits that are being plowed back into R&D and equipment investments for future generations of products. If these companies only made semiconductors, it might be easier to dismiss. But most of these firms are already or soon will be actively competing against us in the world computer marketplace. The sheer size of these profits is worth considering: for 1 meg DRAMs alone, market analysts' calculations have suggested that the value of sales exceed costs in 1988 by anywhere from $1.2 billion (for Japanese companies only[45]) to close to $2 billion (all suppliers[46]). 1 meg parts alone probably accounted for one-third of Toshiba's operating profit in 1988, one-fifth for Oki, 17 percent for Mitsubishi Electric, 15 percent for NEC, 13 percent for Fujitsu. These are large flows into these firms' coffers, profits that will almost certainly be eventually turning up as competitive pressure on American computer companies' profits.

IV. How Does One Respond?

The serious possibility of an organized foreign cartel acting against the interest of an important U.S. high technology industry raises significant new policy issues. Whether or not such behavior is occurring at the moment is less important than the fact that it has occurred, and that a potential for its reoccurrence exists. It seems to me that some of the current debate over reentry by U.S. producers into the DRAM business, and the government's role in supporting that reentry, is most easily understood in this context.

Directions for Public Policy. One objective for American public policy in the DRAM area might to be to minimize the extent to which foreign DRAM producers can act collusively to squeeze American companies in the marketplace, and to come up with a sensible, non-destructive trade policy. There are two requirements for successful strategic (cartel-like) behavior by foreign DRAM suppliers. (OPEC's difficulties come to mind when one attempts to illustrate these points.) First, such behavior must be organized and administered across companies. Since every individual DRAM producer has an incentive

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criteria. Products can be deleted from the monitoring list by mutual consent of **both** governments." [The emphasis has been added by me.]

[45] Calculated by converting a fiscal 1988 operating profit of 150 billion yen at 130 yen per dollar. See Barclays de Zoete Wedd, **Japan-Electronics, Semiconductors**, (Tokyo), December 1988, p. 17.

[46] According to In-Stat. See Richard McCausland, "Semiconductor Makers Concerned Price Cuts Could Hamper Growth," **Electronic News**, January 2, 1989, p. 22.

to cheat on cartel restrictions, if such cheating is feasible and difficult to detect by others, though cheating by all would destroy the cartel and return one to a competitive market. Second, the cartel must prevent or discourage entry into the business by other firms not affiliated with the cartel. An attack on such cartel-like behavior, conversely, should attempt to make its administration difficult, and encourage entry by independent firms.

On the administration side, MITI's activities clearly played a central role in initially organizing production cutbacks in Japan. Therefore, hindering MITI's ability to gather the information required by a successful cartel-- reliable data on production and investment decisions by individual firms, demand for DRAMs by major users-- could serve a useful purpose, and is a logical place for the government to get involved. The formal mechanism MITI uses to assemble such information is the Supply-Demand Forecast Committee, which issues the quarterly reports discussed earlier. However, it is unclear that the Forecast Committee itself is central to the entire process.

The Forecast Committee is an informal advisory panel to the director-general of MITI's Machinery and Information Industries Bureau, composed of 12 members. Three of the members represent the semiconductor industry, 6 represent users, and 3 are outside experts. In the fall of 1988, the three chip industry representatives were drawn from Toshiba-- who also chairs a group representing semiconductor manufacturers in the Electronics Industry Association of Japan (EIAJ), NMB Semiconductor, and Texas Instruments Japan. The six user representatives include individuals from IBM Japan, and five user trade associations. At one point these included a gentleman from Hitachi on the computer board of the Japan Electronics Industry Association (JEIDA), an NEC employee from the Communication Industry Association of Japan, a representative from Canon sitting on the board of the Japan Business Machine Makers Association, another Toshiba man chairing the consumer electronics board of the EIAJ, a Yokogawa employee apparently representing electronic instrument producers. The three outside experts are Professor Tadao Miyakawa of Hitotsubashi University, who chairs the Forecast Committee, and employees of the Nomura Research Institute and Dataquest Japan.

MITI asks 64 Japanese companies who are producers and/or users to supply figures on estimated shipments and demand, compiles the data from the individual companies, and supplies it to the Forecast Committee for discussion. The fact that MITI actually compiles the numbers that are issued, as well as the participation of representatives of **gaijin** companies, suggests that the Forecast Committee may be little more than a rubber stamp on the numbers put together by MITI. However, these companies' participation might serve to legitimate the Forecast Committee process, and the "forecasts"-- in 1987, at least-- did serve as guidelines for producers.

At a minimum, affected U.S. companies should insist that the deliberations of the Forecast Committee be made a matter of public record. TI, IBM, and Dataquest have not been particularly public about their participation on the Committee, perhaps because they see it as potentially embarassing, and their Japanese affiliates find it difficult to resist "requests" from MITI. But according to MITI, they are sitting on that committee in order to represent users and experts. If so, should they not be reporting back to their respective constituencies?

Also, U.S. representatives might insist that MITI demonstrate its sincerity about its statement that "Since there seems to be a misunderstanding that this supply-demand forecast is compiled for the purpose of restricting production, we make it clear that it is not compiled for that purpose but for the reference of related parties and that manufacturers are free to produce more than the production in the Forecast."[47] This could be done by asking that MITI employees not solicit disaggregated, company

[47] See MITI, Machinery and Information Industries Bureau, "Semiconductor Supply-Demand Forecast for the 1st Half of 1989," December 23, 1988.

proprietary information about semiconductor production and investment, that such data be solicited on confidential surveys administered by the Statistical Agency (Japan's equivalent of the Census Bureau), and the aggregate results be communicated to MITI for its "reference" purposes. MITI would thus still obtain the aggregate information for Japan that it feels it requires, and there would be no danger of paranoid gaijin misconstruing it as an attempt to administer or enforce a cartel.

Another theoretical possibility of attack on collusive strategic behavior is to pursue antitrust remedies-- initiated by either government or industry-- against Japanese producers. Unfortunately, the evidentiary burden would be great, and concrete proof difficult if not impossible to obtain. Worse yet, the U.S. government's initial role in encouraging production and export restrictions would seem to require that the entire STA-- including the various confidential memoranda-- be terminated, and some entirely new arrangement not encouraging state action to control exports be negotiated.

The Paradox of Entry. Encouraging entry into DRAM production might seem to be a more productive approach for limiting cartel-like activity. Unfortunately, there is a paradox to be faced here. It is thought that production of commodity products like DRAMs (the single largest volume semiconductor product) is characterized by significant learning and scale economies. Experienced, higher volume manufacturers then have advantages over smaller, more recent entrants. The "natural" structure of such an industry would then be oligopolistic, with or without collusion among the oligopolists. However, if prices and profitability are high, there exists a temptation for a new firm to enter anyway, to take advantage of that extraordinary profitability, even if one is not initially the lowest cost producer. If entry were costless, the discipline of entry would drive prices down to a level where prices would just cover total costs over the life of the product, and we would describe that market as "contestable". However, if there are "sunk" costs that cannot be recovered upon exit from the industry (like R&D investments, or specialized capital goods with high depreciation rates and limited application to other products), entry or potential entry becomes a much less credible threat. The threat of entry will not serve to discipline pricing by existing firms, since new entrants risk substantial losses if they attempt to compete in a price war and lose, and incumbent firms realize this.

Commodity DRAM production today requires a substantial "sunk" investment, in R&D on design and process technology, and in the large capital investments required to build a state-of-the-art fabrication line. These increasing costs of entry probably have much to do with the shrinking number of firms involved in DRAMs. All except the largest, lowest cost producers would probably lose money if chips were priced to just cover cost, based on the costs of the most efficient producers. Because potential entrants realize this, entry is limited, and the remaining producers are small enough in number to make it feasible to act collusively.

This creates a Catch-22 of sorts. If no entry occurs, the few remaining producers find it possible to coordinate their actions to increase profitability. If entry does occur, the new entrants may discipline pricing by the incumbent firms, but are likely to be much less profitable and perhaps even lose money. This, it seems to me, is the paradox of entry that the U.S. computer and semiconductor industries are grappling with. A new entrant created to limit the monopoly power of a small number of incumbent firms in the DRAM market is likely to lose money if the incumbent oligopolists react by cutting prices to drive the challenger out. Even if successful from the strategic perspective, the investment in DRAM capacity could well lose money in the marketplace as the incumbents react.

The point is that a money-losing entrant into the DRAM business, which is able to impose some competitive discipline on the actions of the other players, ought to be counted as a success from the perspective of those who purchase the product. The decrease in monopoly profits transferred to the incumbent chip producers from chip consumers would more than cover the losses of the new entrant even if it operates at some cost disadvantage.

This argument is given special urgency from the viewpoint of computer systems producers. It is a well known fact in the industrial economics literature that a monopolist controlling the pricing of an input generally maximizes his profit by integrating forward into the user industry which purchases that input.[48] Since Japanese semiconductor producers also happen to be computer systems producers, this is much more than a theoretical curiosum. These Japanese companies have both the systems know-how and the memory chips, and are clearly focusing on increased penetration into computer markets.

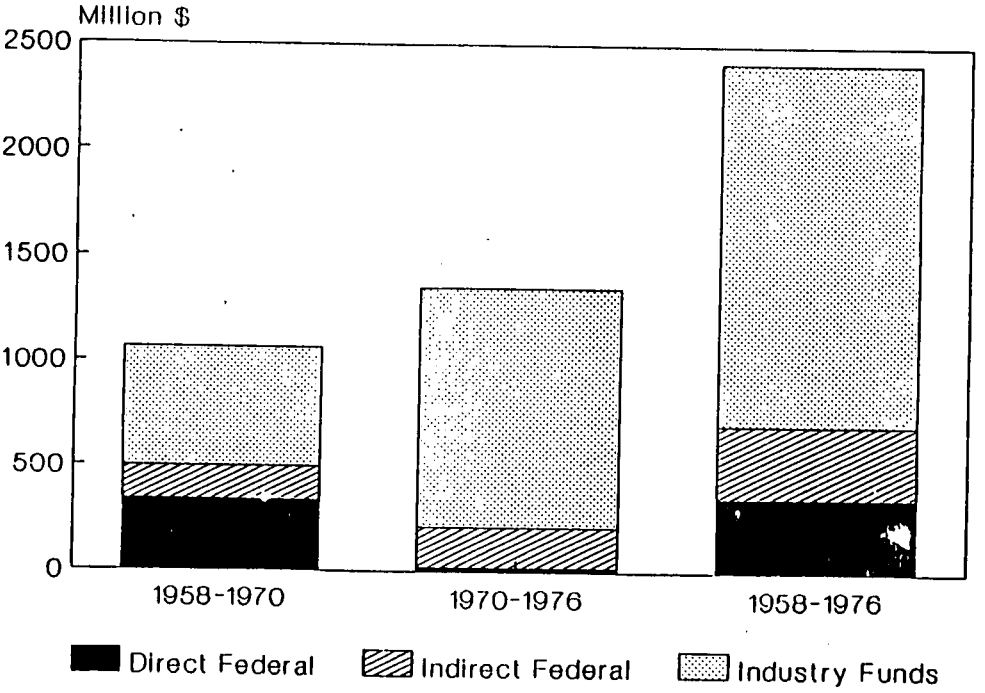
Thus, the costs of financing re-entry into DRAMs ought properly be regarded as "anti-cartel insurance" as much as an investment in an independently viable business. Such an entrant may prove a success from the perspective of the computer industry even if it loses money on its merchant semiconductor business. It becomes a public policy question because the prime beneficiary of the policy is likely to be the computer industry, not the merchant semiconductor industry, which would ordinarily be expected to be the agent of this policy. And it is a public policy question because the benefit of the policy is received by the entire industry, not just the individual firm or group of firms which finances such a venture.

A government role might therefore be appropriate in ensuring that it happens. Individual computer firms would receive only a small share of the social return on such an investment in DRAM reentry, and semiconductor firms might even receive a negative private return. (Implicitly, recent events bear out this view-- the U.S. merchant semiconductor industry has displayed little interest in risking its resources in DRAMs, and it is the computer companies that are actively pursuing reentry.) A case might therefore be made for a coordinating role and even a partial government subsidy for such an effort, based on the divergence between private and social return. Even if the computer industry were able to organize a joint effort entirely on its own, exemption from antitrust would seem to be required, and again, government involvement required.

To conclude, national policies in the semiconductor industry have increasingly shifted from support for the technology base, to trade policy and the organization and regulation of strategic economic behavior. Our recent actions have encouraged this shift, and have institutionalized greater government intervention in the production and pricing decisions of individual firms, in the name of "managed trade". Is this really in our long term interest? Would we be better off expending our political capital on a determined effort to open up the international market place, instead of negotiating its closure and partition? These are important questions for national policy, and the semiconductor industry's trials and tribulations are the leading edge for a debate which will ultimately involve even larger stakes. I don't pretend to know the answer, and would appreciate any help from any of you in groping toward it.

[48] This was first shown in John M. Vernon and Daniel A. Graham, "Profitability of Monopolization by Vertical Integration," **Journal of Political Economy**, vol. 79 (July-August 1971), pp. 924-25.

U.S. Support for Semiconductor R&D



Source:Department of Commerce

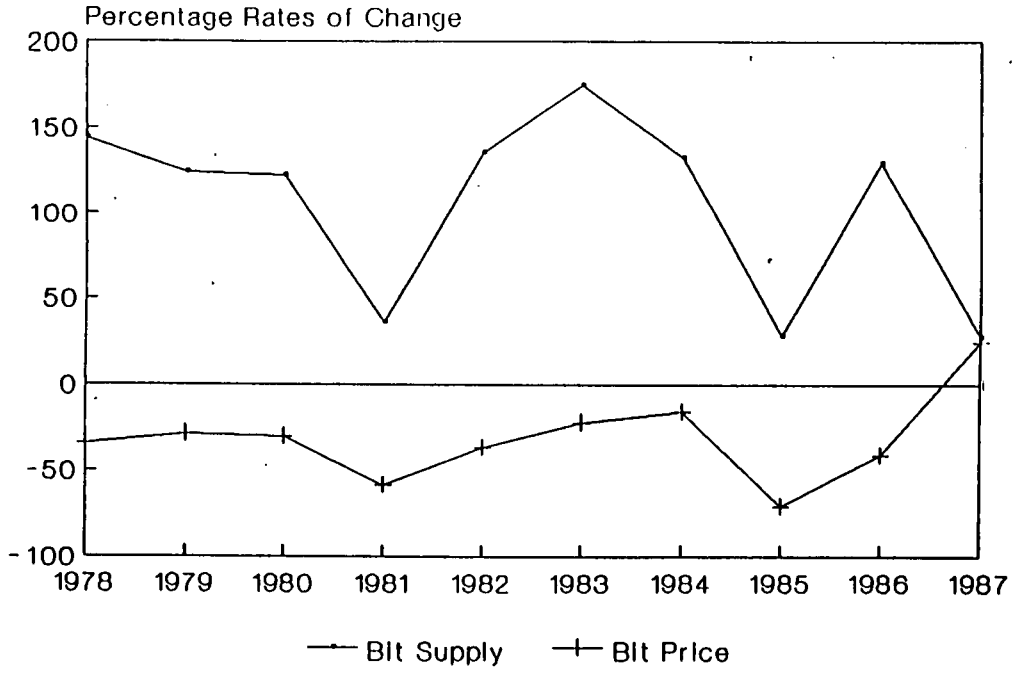
K. Flamm, Consulting Economist

MITI Support for Semiconductors
Major R&D Efforts

Project	Comments
1964 Digital Computer ICs	NEC, Hitachi, Fujitsu announce IC Computers in 1965
1966-71 Super High Speed Electronic Computer Project	1st semiconductor memory, high performance logic, LSI chips
1971-80 PIPS Project	16-bit microprocessor
1973-74 IC Development Program	Liberalization of Japanese mkt.
1976-79 VLSI Program	Terminated by U.S. pressure; "private sector edition" 3 yrs more; 1 micron device tech, sub micron process tech, 64K DRAM, Canon stepper, Toshiba E-beam system, etc.
1979-83 Next Gen Computer Basic Tech Program	
1981-95 New Electron Devices	Superlattice devices, 3-D ICs, bioelectronic devices.
1986-93 Advanced material processing & machining system	Advanced surface processing w/ laser/ion beams; elec applictns

K. Flamm, Consulting Economist

Historic Trend in Bit Price & Supply



Data: Montgomery Securities

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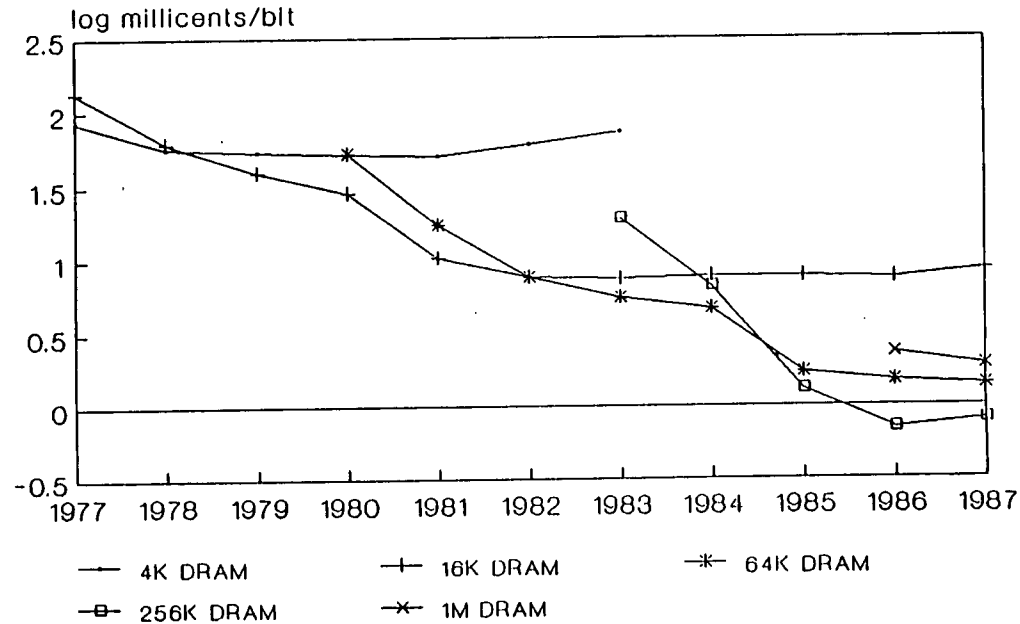
Historic Trend in Bit Cost



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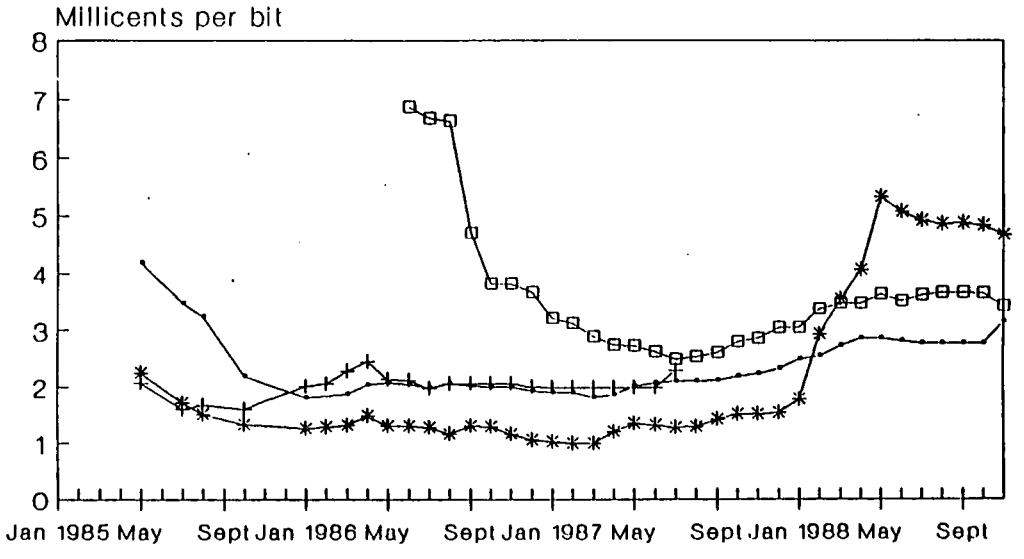
Data: Montgomery Securities

Spot Retail Chip Prices in U.S.



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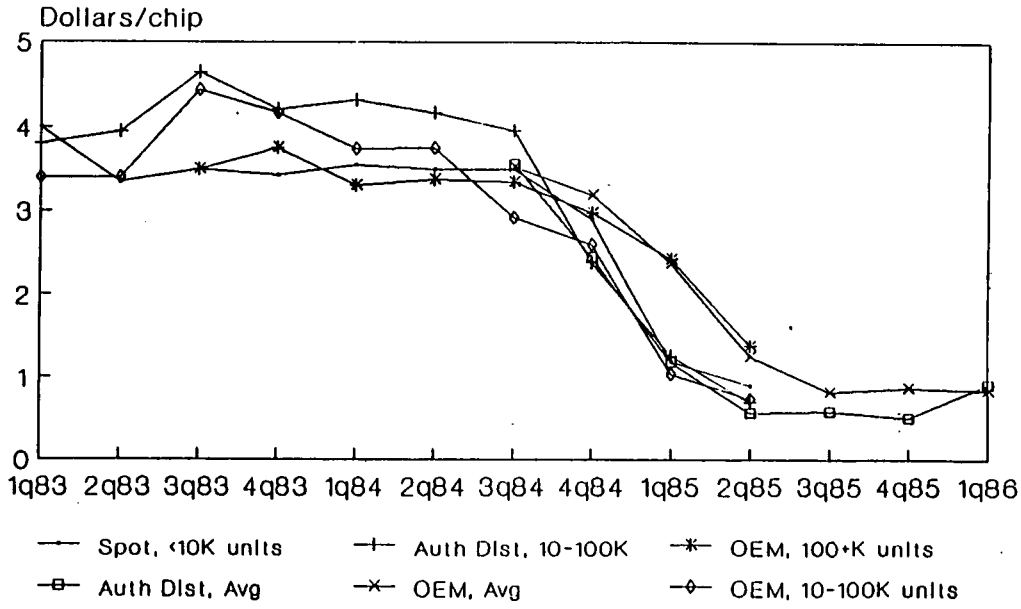
Nov 1988 is average through Nov 15

Selling Price Structure in U.S. Market

64K DRAMs, 150ns, Japanese produced



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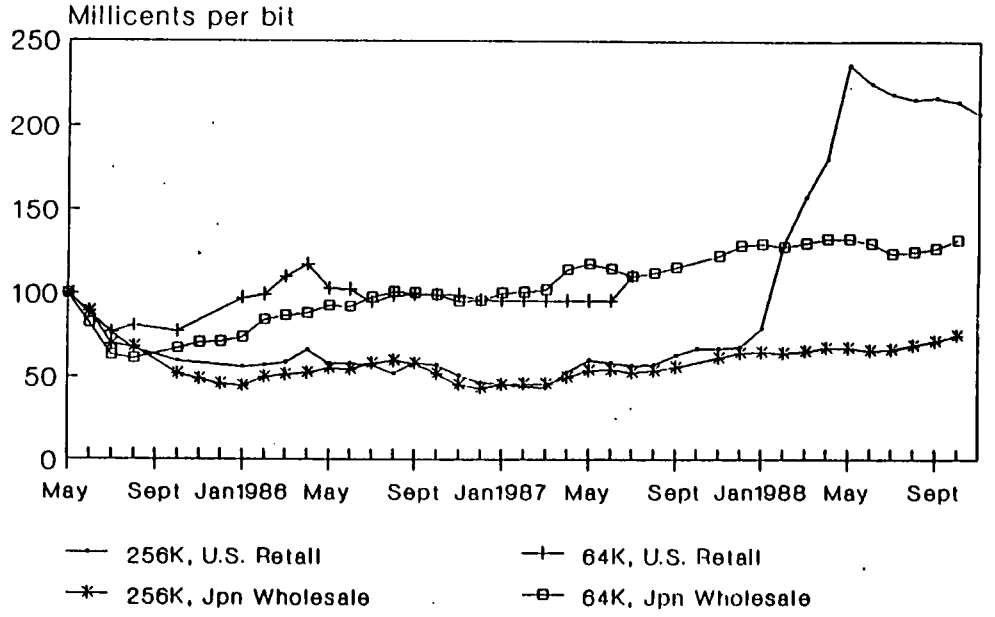
Data: USITC

Relative DRAM Cost, U.S. & Japan

Indexes: May 1985=100

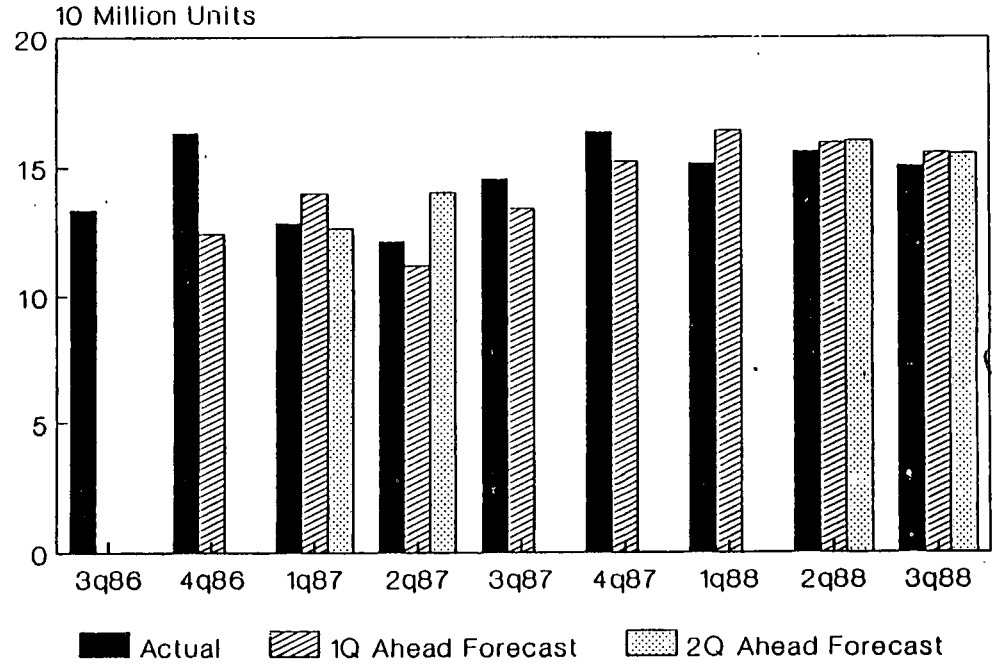


Jpn data from JAPAN ECONOMIC JOURNAL

Exchange rates are IMF, except Sept, Oct 88: 130, 126

K. Flamm, Consulting Economist

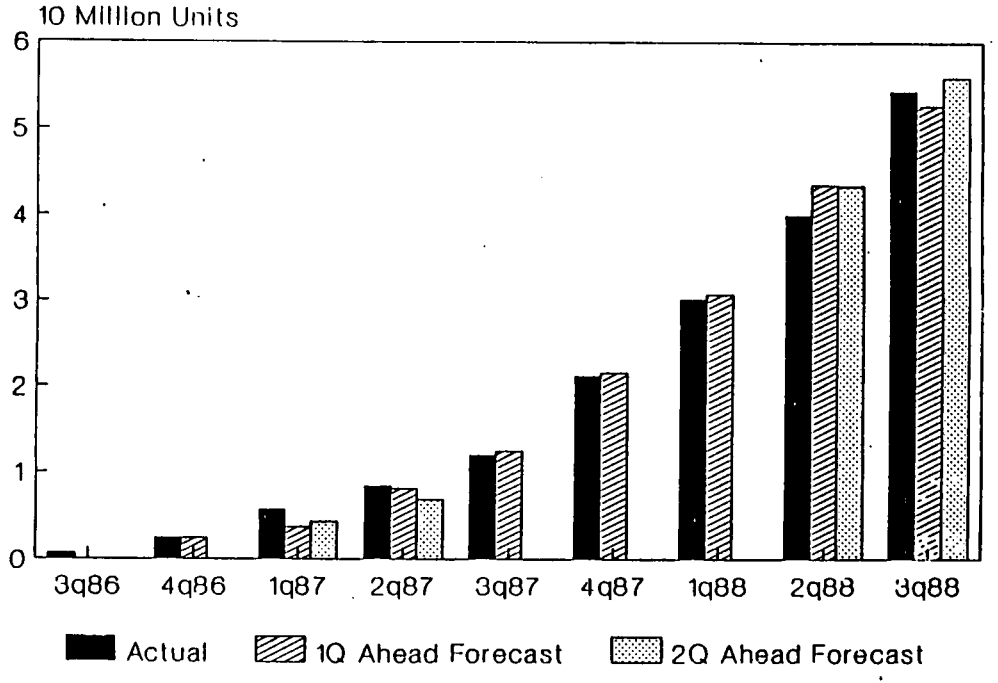
Actual vs. Forecast Prod of 256K DRAMs



K. Flamm, Consulting Economist

Source:MITI Forecast Committee

Actual vs. Forecast Prod of 1M DRAMs

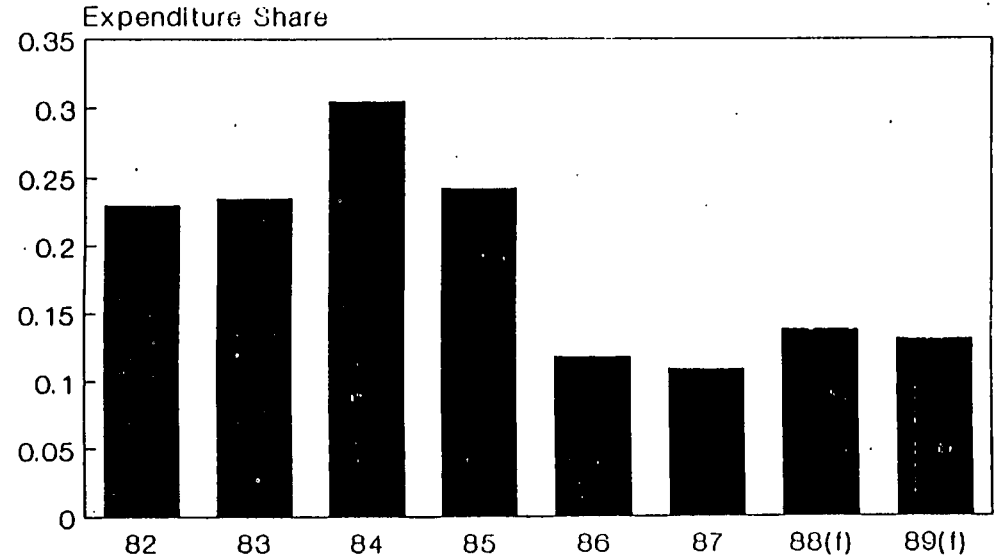


K. Flamm, Consulting Economist

Data: MITI Forecast Committee

Japanese Semi Equipment Investment

Relation to Production Value

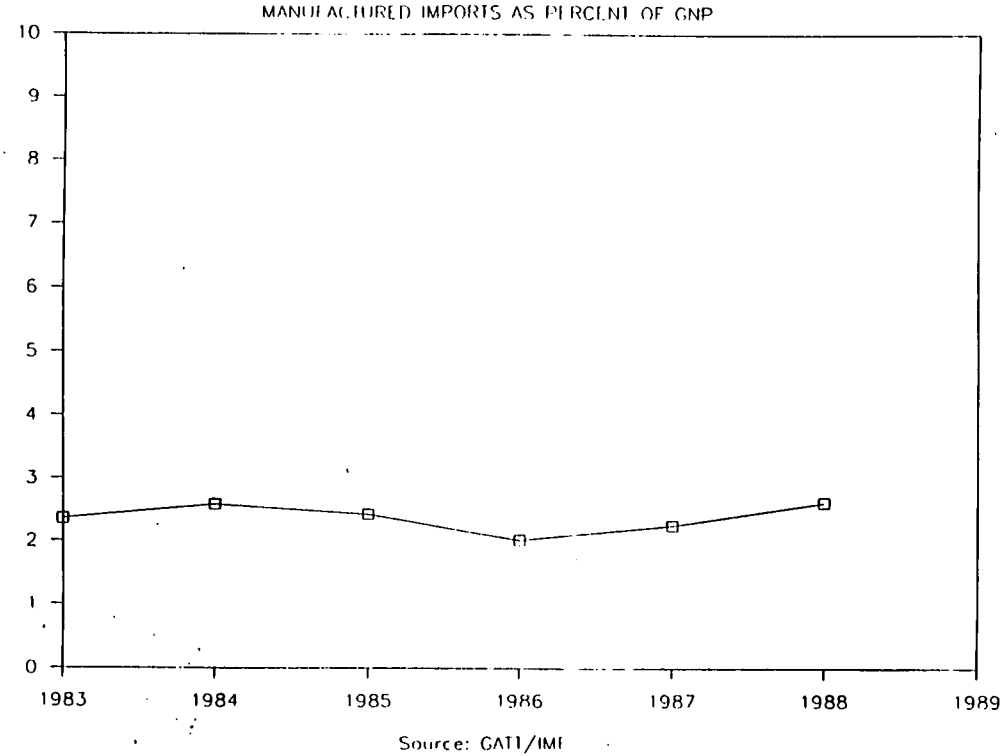


1988 and 1989 are forecasts.

K. Flamm, Consulting Economist

Data: NOMURA SEARCH, October 88

JAPAN:


MANUFACTURED IMPORTS AS PERCENT OF GNP
10
9
8
7
6
5
4
3
2
1
0
1983
1984
1985
1986
1987
1988
1989
Source: GATT/IMF

Representative HAMILTON. Thank you, Dr. Flamm.

We'll begin with questions.

Senator Bingaman.

Senator BINGAMAN. Thank you very much, Mr. Chairman.

Let me compliment all the witnesses. I think they have given very good statements here.

Let me just ask each of the witnesses a question or two.

Dr. Harris, let me ask you. On the IMS proposal that the Japanese have made, it raises in my mind the question of why we are not making proposals for cooperative research and development activities or ventures with the Japanese particularly in areas that we acknowledge Japanese leadership in.

Obviously there has to be something in it for them as well as for us. But if we have identified areas where we think we could gain, it seems that I've been somewhat disappointed with the inability of our industry and government to get their act together in response to the IMS proposal. I know we're struggling to do that, and we have meetings recently in all of that.

But we still are a long way from having a clear response in hand, and to my knowledge the Administration is going to ask for no money in this upcoming budget with which to participate in IMS, while the Japanese have indicated a willingness to put in $400 million over the next 10 years.

So I guess my general question is what do we need to do to more appropriately respond to IMS and, secondly, why do we not seem to have the capability to propose initiatives on our own for cooperative technology development?

Ms. HARRIS. A good question. I'm not sure any of us have the final word right now since this is really a discussion that is in process. The IMS proposal that originated from the Japanese side more than a year ago had a lot of preparation behind it.

One of the things that I think is a problem more generally is that we tend to become aware of these proposals after they have been initiated and formulated and moved down the road—when some people would say after the train has kind of left the station.

And I don't say that to be critical of the Japanese. I think that they were trying to put together a proposal that then others could respond to, but that pattern is very typical I think.

As a result, the last six months or so I think have really been devoted within our country to trying to put together a response, and some people would say this is a very fortuitous thing—that the initiation of IMS by the Japanese has provoked a new kind of interaction here between government and industry.

My reading is cautiously optimistic in that regard. I think a good deal of the work and effort has gone into looking at the Japanese proposal, to thinking about some general principals that should guide participation. But really the proof is in the pudding, and the key issue concerns the technical content of the proposal, and I think there we have a great deal of work to do in identifying which fields we want to play in—where we can benefit and maybe even identifying somewhere where we would say it might not be so useful to go forward.

At this point I think it's not exactly clear how that process will take shape, what are the mechanisms, whether they be industrial advisory committees or new organizations that will be formed.

Senator BINGAMAN. Do we need to lay out in statute or otherwise a process or a structure that our government will use to deal with this issue. It seems like, you know, there were several months that went by before we could figure out who ought to respond on the IMS proposal because nobody is in charge of manufacturing in our government. That's not something that our government has seen any responsibility to deal with.

I mean are we going to have the same thing in the sixth generation computer project, which is the next train coming down the track as far as I can tell? Are we going to be flopping around from agency to agency to agency to see who ought to try to decide if we should be involved in that in some way?

Ms. HARRIS. Senator, I think there is a real danger that that could occur. I'm not sure if we need a statute at this point, but we do need some kind of a mechanism which would permit rapid response and more of a active anticipatory look as well, and this has to involve the technical people, it has to involve industry people as well as agency officials, of course. Right now I don't see that mechanism clearly in place.

Senator BINGAMAN. Dr. Finan, let me ask about your T-House suggestion, a special facility in Japan to try to give some focus to this or some on-the-scene capability to institutionalize this.

We have struggled for the last year or two to try to identify a better way to organize our ability to monitor technology activity in Japan, and I guess that there is a certain amount going on.

The Science Counselor for the Embassy has a certain amount of resources that he is using to try to do this, and there are several of the defense related agencies that have some capability in this. NSF has a person in Japan that is dealing with this problem in some fashion. The Department of Energy has a person who is dealing with some piece of the problem.

We directed in the Defense Bill this fall that the Secretary of Defense take the lead in setting up an office to coordinate and facilitate monitoring and cooperation in technology in Japan. Now maybe that's not the right place to have it done, but it was something along the lines that you're suggesting here, and I just wonder if you could elaborate a little on how yours would work and how you set such a thing up outside an embassy or unrelated to all these other things going on?

Mr. FINAN. Senator, it springs from something I think is just a very practical observation, and I think Dr. Harris noted it in a conversation with you prior to the hearing, which is personal contact is the critical ingredient by which knowhow is exchanged and by which you get a window into what is going on in Japan.

And with that as the springboard, the idea behind this is simply that we need to have a flood of people going over there, and it would be nice if they were over there for several years, but we need to have a continuous stream of people visiting Japan and that's a very expensive proposition.

Second, we don't want the people who are coming over there to continually flounder around trying to figure out what institutions and what researchers do they have to pay attention to.

So the concept is fairly simple. It's to say that you would have a hostel, a place that would have inexpensive, subsidized housing, one, and, two, a permanent Secretariat or staff and they do some very simple things. They keep records as to what researchers or where, their telephone numbers and maps to get there, cull through any sort of ongoing documents that flow from those institutions and have them available.

So the visiting researcher can have very efficient search process to know where he has got to go and, secondly, that that researcher will know that he can very inexpensively return to Japan periodically to update his understanding.

I recall a story that I heard from a JTECH researcher, this is the Japanese technology evaluative process that I spoke of earlier. This was in the area of artificial intelligence, and this researcher was from a major U.S. laboratory. He said one of the striking things was when he went to Japan was that he learned more about what was going on in his laboratory than he was ever aware of—even things going on just down the hall. And, in order to maintain that kind of currency, you have to have frequent contact.

The whole idea behind JTECH is nothing very sophisticated or fancy, but it's very basic. It's just saying let's provide a Secretariat for a repository of knowhow and inexpensive housing. Lower the cost of going there.

I spent 10 days crawling all over Japanese labs in the last part of October. My burn rate in Japan in terms of dollars is probably on the order of $500 to $1,000 a day to move around. I'm scared stiff if I have to take somebody out to dinner, by the way, Senator. I pray to God they will take me out to dinner.

[Laughter.]

Senator BINGAMAN. You ought to be going over there on a Federal Government per diem, which is just did.

Mr. FINAN. Absolutely, and I completely sympathize with that as well.

I just want to emphasize that sometimes we don't have to, you know, do a moon shot here to solve a problem, but we can do it with some very basic, simple things.

Senator BINGAMAN. Let me ask you about another of your specific recommendations. You said that we should perhaps require that if—this is the way I understood your suggestion, and I don't think it's in your written testimony, but I thought it was an interesting one—that if contractors are going to sell defense equipment or technology to the government and part of that is sourced in Japan by subcontractors presumably, that we need to require any Japanese company selling for ultimate delivery to the U.S. Government, U.S. Defense Department to create a second source in this country, to license that technology to someone in this country so that we are not dependent upon them continuing to sell. Is that basically the idea? If you want to elaborate on that, I would be interested in hearing it.

Mr. FINAN. That's the essence of the idea, Senator. I don't know all the legalities, both the extraterritoriality issue as well as the

others, but one is struck by the fact that for decades Defense Department policies have encouraged second sourcing among U.S. suppliers, and we are granting an enormous benefit to a foreign supplier, particularly if he is a sole source supplier, of not forcing on him some of the requirements that we force upon an American supplier.

I think it's worth investigating to see whether in fact it's doable and, for example, when we encounter an area that a key technology is being sourced from abroad, we should explore with that company their willingness to establish a transferee in the United States.

Senator BINGAMAN. Not to interfere with their sales, but to ensure that we are not totally dependent upon their willingness to sell.

Mr. FINAN. Well, in history of course we have done it for reliability. We say well, you know, something goes wrong with your facility and we need this backup source for reliability, and I think it would be in the long-term interest as well particularly to have a second institution that has the technical wherewithal. In certain instances one can envision that we would have to rely upon them as the only place to turn to under a critical set of circumstances for the knowhow to proceed to develop and support U.S. interests.

Senator BINGAMAN. Dr. Flamm, let me just ask you one question. You sort of said we should put the choice to MITI as to whether they want to continue to give administrative guidance, and in doing so, if they do, then they under our preference would also be willing to set these targets, these targets for market share in different key areas or, on the other hand, go to this open trading system in high technology products, which would mean no more administrative guidance. That's the choice we ought to put to them.

Do you really have any doubt that as a practical matter we are not going to jawbone them into abandoning their well-established and fairly high successful system for interacting with industry and identifying things that industry ought to be doing?

I guess I'm not in disagreement with you on a theoretical basis, but it does seem to me that the more promising of those two options is for us to get in there and say, look, we know that you are going to continue to give this administrative guidance and we thereby want a particular market share to be established as part of that.

Mr. FLAMM. Well, let's start out by talking about, you know, the kind of administrative guidance you're talking about here precisely for a moment.

There is no doubt that a lot of what MITI is credited with has to do with the technology area, identifying interesting technologies in coordination with the government and funding what you could call pre-commercial investments in those areas.

I don't think that's something that we want, that the world trade regime for high-technology products ought to be doing away with. I think that's something that is positive, and I think that is something we should be doing, and I don't think that getting rid of that is going to be the part of developing a reasonable system for what seems like an increasingly complicated area of trade friction. So

that kind of guidance, I don't think we should demand or ask them to do away with.

I think in fact that we ought to just get a lot more efficient at doing it ourselves, that is, in coordination with industry and the government playing a positive role and identifying important areas for pre-commercial technology investment. I have no problem with that. I think that's a very important part of what MITI did and continues to do, and I think we ought to be doing more of that.

But there is a part of MITI's historical responsibilities that really isn't very compatible with an opening trading system and open markets, and that part of it has to do with its historical role in suggesting, advising guiding investments and industries, levels of capacity, dividing up markets in recession cartels, for example.

Certainly I think there are a lot of forces for change within Japan, and if you talk to people in the Ministry for International Trade and Industry, it's quite clear that MITI sees its role as changing, but as is always true in Japan, an important force for change has always been outside foreign pressure, Gaiatsu.

And I think that undoubtedly some people within Japan would welcome foreign pressure in particular areas simply because that's the tool for getting things done in terms of structural change in Japan. That's the lesson of the history of our relationship with Japan.

So I think the choice for the U.S. is this. We really face a fundamental fork in the road here. What direction are we heading in right now? The direction we are heading in is that individual high technology industries in the United States having their problems with Japanese competitors and Japanese markets are coming to you on the Hill and making a special case, and some kind of arrangement that does a little bit for them without really getting at the root of the problem.

You're going to get more and more special cases like this showing up at your door step, and if we go with the path we are currently marching down, that is, politically negotiated market shares, that's going to be the end for all practical purposes of an open trading system in high-technology goods.

Now you say may, so what, you know, we'll do okay. We're big, we're powerful, we're strong and we'll get a good chunk of the market, but that is not always necessarily going to be the case. When we negotiate with the Europeans, for example, and they argue with us, well, we have a lot of perfectly good firms here, you're taking too much of the market and we are going to put a cap on your market share, you know, what are you going to say, that that's an inviolable principle they're violating? No. Obviously we are going down that path right now.

So it seems to me that we have to make a choice. We have to try to come up with some kind of new kind of arrangement that is basically going to create an open trading system, and that means new rules of the game, certain minimum pre-conditions that have to be met by everybody signing onto the system and penalties for those who don't.

Anyway, to return to your question, is it likely that they are going to dissolve this industrial policy structure that they have been so successful with, as you put it, I think the most successful

aspects are the technology parts, and we are not asking them, I wouldn't be asking them to break that up. I would merely be saying put that aside from the other functions that you've historically performed.

Now these other functions, what is the legitimate role of these other functions in a real market-driven economy where everyone is allowed to compete and offer their goods for sale on an equal basis? Those other functions, you know, steering companies with telephone calls, dividing up production capacity have no place in a market economy.

So Japan basically has to make a choice. They are either going to be part of the market system that others want to maintain in these products, or they are going to go their own path towards negotiated market shares or whatever, and that's going to sink the international open trading system in high-technology goods.

If they go that latter path, we have no choice but to insist that given this historical legacy of discrimination that we, you know, have a reasonable market share, and that is also objectionable to the Japanese.

So they may choose a negotiated route, but that also brings costs for them, and I think there are allies on the other side, on the side of change in Japan. So I don't think the choice and the options are as straightforward in terms of what they are going to do as you might think.

Senator BINGAMAN. Thank you very much, Mr. Chairman.

Representative HAMILTON. Mr. Upton.

Representative UPTON. Thank you.

Ms. Harris and Mr. Finan, both of you in your testimony talked about targeting particular technologies. What exactly does the Japanese Government do when it targets a technology? I believe in both of your testimonies you indicated that about 20 percent of R&D comes from the Government versus private industry. How does that bring about or guide the private spending that might be there?

Ms. HARRIS. I don't think I used the term targeting in my testimony, but I think that a few years past we talked about targeting industries, and certainly throughout the last 20 or 30 years you can look and see very explicit references within say the MITI visions to a plan to move from heavy industries to electronics or whatever, and in those cases historically there were a whole array of policy instruments that were used to make those transitions possible. R&D subsidies are more important now, and in years earlier assistance through the Japan Development Bank, tax measures and a whole variety of things were used.

I guess what I would emphasize in response is that today I think what you're seeing is a stronger emphasis on what I would call generic technology development, and the key point here is that the policy focuses not so much on an industry, whether it be semiconductors or computers, but rather on identifying some technologies that are going to be critical for a number of industries.

And in those cases what we see happening today are large-scale projects that involve fairly modest amounts of government direct financial support where industries are brought in to work together at a pre-competitive or early stage, and then the industries them-

selves, the individual companies go off and bring those new ideas to the marketplace when the time comes.

So I think today we are seeing more of a venture capitalist type of role, and I think we are seeing less of an industry targeting effect than we are seeing a technology focus.

Representative UPTON. Dr. Finan.

Mr. FINAN. I concur with that, but a couple of just additional points.

One is of course that I didn't use the term targeting, but since we're talking about advanced technologies today, we'll focus on that. One should recall or keep in mind that they do a lot more, or stay more active in so-called declining industries, a lot of the conventional instruments that we understood, the cartelization activities that are very actively used today, but are really only in the declining side of the ledger.

I have one comment on the other side though. I think we have some degree of misunderstanding about how MITI decides on where to place its emphasis or resources. It was told to me, for example, by one of the leading researchers involved in the VLSI program, and that in that instance there was a small group of the Japanese R&D people who went to MITI and tried to explain the nature of the problems they had—what we can call generic or precompetitive issues.

More recently he was noting that the companies now will tend to collectively go in to see MITI in areas where they can't get their own managements to pay attention, and they sort of, in some sense, go through the back door to MITI, convince MITI that it's very important that they pay attention to it, and with that laying on of hands they then can go back to their managements and say this is important, you'll notice what the government is doing. It's interesting, and it's sort of the nature of things. So it's not as if MITI in an autonomous fashion decides to lay hands on, but it's very much, almost with the urging of the private sector to focus on a certain area.

Representative UPTON. Do you feel that if we were able to accomplish lowering our budget deficit and opening up the Japanese markets that there would be a need for additional government support for science and technology given where we are today?

Ms. HARRIS. I interpret your question to mean specifically additional attention on the scientific and technology dimensions of our bilateral relationship; is that correct?

Representative UPTON. Yes.

Ms. HARRIS. Yes, I do, attention broadly defined. For example, I am not sure about the long-term outcome of Japan's official commitment to strengthening basic research. Of course, a lot has been said about that, and I think there are people who think this is something that should happen. It's not clear that it actually will, at least within the university system.

Our country has a very strong basic research base, and I think that base, that strength has to be maintained and it will be a focus and a foundation for competitiveness in the future.

I also think that even in the bright world that you describe we need to pay much more attention to understanding what is going on in Japan and applying those lessons directly to our manufactur-

ing production lines in ways that will make an economic difference here in the U.S.

My colleagues here may disagree with me. I'm not sure that will happen quickly, or under those conditions quickly enough to maintain the kind of competitiveness we're looking for into the next century.

Mr. FINAN. As you said, the bright future here.

Representative UPTON. Yes.

Mr. FINAN. I think that your question has a different angle to it as I would interpret it, which is that we do obviously have severe constraints, and then the question is what priorities do we operate under with those constraints, and I think part of what I would urge is that people begin to rearrange priorities.

Again, you go back to the Chairman's statement where he noted that we don't lead in very many areas relative to Japan, and some of the areas that are most important to our long-term competitive position, areas related to manufacturing, it's clear that we have a great deal to learn from Japan, which is just that even if the budget problem remains perplexing and so on and so forth, we then reorient our priorities.

Just a comment on basic research in Japan. What is very striking is we have gone around and talked to the so-called central laboratory directors and managers in Japan. This is areas where if there is any basic research going on, it's going to be there. And you really don't' find basic research as we understand it.

Now let's recognize that in order to conduct basic research you have to be a very wealthy nation. Basic research is a luxury, because presumably it has no connection with near-term requirements. And the Japanese will very often say to us, you know, we can strike a deal here. You have very good basic research capabilities, and we'll take your ideas and we'll use them for manufacturing, and I would very often say to them that doesn't simply compute. We have to have wealth and economic rents here to afford basic research, i.e., we have to have a manufacturing base here that generates that wealth and supports the basic research.

So in the long term if Japan is going to conduct basic research, they clearly already have the wealth. They may not have the institutional mechanisms to support it. Now by that I mean the history of understanding what really goes into creating a good Bell Laboratories environment or University of California, Cal Tech, this kind of thing.

We are very lucky to have that culture here, and in some sense we have an easier task, which is to focus on the issues of manufacturing and instilling a manufacturing culture here, and I think we can do that. But we can't lose sight of the fact that we can't allow the Japanese to dictate the terms of the bargain: that we do basic research and they do the manufacturing. That is not a long-term arrangement that has any viability to it.

Representative UPTON. Do any of you on the panel see—I know in our country they talk quite a bit about the shortage in the coming years of qualified engineers. We have tried to redouble some efforts with math and science centers through high schools. We have embarked on a rather ambitious plan that hopefully will come about.

What is the angle from the Japanese side? Do they also see a shortage of engineers for themselves, and what are they doing about it? What ideas are they taking from us or driving for?

Ms. HARRIS. They do indeed worry about that, and there have been a lot of articles that relate the salary differentials between the salaries that a young engineer can get if he goes to the financial world versus staying in manufacturing.

There has been quite a bit of attention to this in the press in Japan. In terms of concrete steps, I'm not aware of a vast number of them. I believe that people within the Ministry of Education and within the university community are very sensitive to this and are looking to ways to build their engineering education and research base through funding grants to individuals and other mechanisms. But they see it as a problem just as we do.

Mr. FINAN. One thing that was striking during the most recent visit I had to Japan is we were looking at the area of computer aided design, development and implementation in the Japanese companies. All of the major Japanese companies we visited spoke about the problems they had with recruiting softwares, they would call it engineers.

What are they doing about it? Well, for one, they are buying more and more from the U.S. They are actually giving up on the area of computer aided design in a number of areas. They are no longer doing a go-it-alone development process. They are relying on third party vendors which are predominantly U.S. vendors.

At the same time, you see a change, a greater willingness to recruit foreign researchers, so-called contract engineers into the labs, and there are a variety of reasons for that. Shortages are one, but they also want a stimulative factor. They believe that foreign engineers bring in a fresh approach to problem solving, and they want to look at that.

So in the long term they actually don't have some mechanisms we have here—their salary structures and the recruiting processes are somewhat rigid. So the salaries can't increase in the software area to recruit engineers into that area, and frankly I think they are somewhat perplexed. They are talking about a two-tier salary structure being implemented to deal with it, but I think in the short run they're struck. They are going to have to give up on certain areas and focus on areas where they see greater payoff.

Representative UPTON. Thank you.

Representative HAMILTON. I wanted to get kind of a sense of your overall assessment of the Japanese economic challenge. Are you folks worried about it? How worried are you? How big is the challenge? Do you lose sleep over it at nights?

Ms. HARRIS. Yes, I think we do.

Representative HAMILTON. Are we in for the economic fight of our life with the Japanese?

Ms. HARRIS. I think we are already involved in a very, almost a turning point in terms of our history. Japan has I think demonstrated the ability of countries that have been far behind just a few years to come forward, and in some ways we should be quite pleased about that because this was part of the relationship that formed between the two countries in the post-war period that saw Japan as playing a role economically.

But I think we have reached a point in time where yes, we should be very concerned. I think we should look beyond the trade balances, as important as they are, to some of these issues in science and technology because this is the pipeline to where we will be a few years down the road.

Representative HAMILTON. Why should we be concerned about it?

Ms. HARRIS. I think we should be concerned because our ability to compete internationally will affect the economic well-being of our citizens and our ability to lead internationally as well.

Representative HAMILTON. Are we losing jobs because of it?

Ms. HARRIS. I'm sure that there are industries in which jobs are being lost for competition. There are other areas in which Japanese investment into this country is reinvigorating companies and plants that would otherwise maybe go under.

Representative HAMILTON. Is that a good thing to have a lot of Japanese investment in this country?

Ms. HARRIS. Well, I think as my statement earlier indicated, there is no easy answer to that. I think it depends on the ultimate nature of the investment.

Representative HAMILTON. There is an interstate highway in my district, and I drive up and down it all the time, and just for kicks the other day I was counting the number of plants that have located along it in the last 10 years, and I think I counted 12 or 13 Japanese plants that have located along that interstate highway. What do you think about that? I mean they are creating a lot of jobs, but they are also sending the dividends back, aren't they, to Tokyo.

I mean how do you feel about that? I mean I know how my constituents feel about it.

Ms. HARRIS. They probably feel pretty positive I would think.

Representative HAMILTON. It depends on whether they are working in the plant or not.

[Laughter.]

No, that's right. If they are working in the plant, it's a good deal. They've got a job that they otherwise wouldn't have. If they're not working in the plant, they tend to be very, very worried about the Japanese threat. You've seen the poles where people are more worried about the Japanese threat then they are the Soviet missiles.

Is that a correct concern?

Ms. HARRIS. I don't think I would make that kind of an analogy where you place the Soviets right with Japan, but I do think that we need to go beyond thinking in terms of an investment as being necessarily good or bad and look at the content of what is really being done in terms of licensing of technology, training the work force, whether there is an impact in terms of increasing exports from the United States. There are many ways in which foreign investment can contribute very strongly to our economy.

Representative HAMILTON. I don't mean to put all the questions to you. These other fellows ought to join in, too.

[Laughter.]

Let's hear from them along this line of questions. You've been hearing me put these questions. How do you react to these questions?

Mr. FINAN. Should we be concerned? Absolutely. Why? I think obviously the standard of living and our unique role in the world

economy. As the Gulf Crisis demonstrates, Japan simply does not have, for a variety of reasons, the capability to play a role.

Representative HAMILTON. Do you think Japan threatens our standard of living.

Mr. FINAN. Depending on how you define threat, yes.

Representative HAMILTON. How do you define it?

Mr. FINAN. I don't want to define it in an adversarial sense like vis-a-vis the Soviets in the military context, but rather that if we do not continue to educate our citizens well, if we don't have institutions of higher learning that graduate citizens of the United States who stay here, we should be concerned with examples like that.

Where does Japan come into play on this? Let me give you kind of a concrete example that I've noticed in certain areas of the technical world that I deal with. You can't get business leaders to commit resources to good ideas. The notion that our entrepreneurial qualities are our salvation——

Representative HAMILTON. American leaders.

Mr. FINAN. American leaders—is nonsense. You either can't get the firm to make the commitment or Wall Street to make a commitment or what we call the vulture capitalists, the VCs, the venture capitalists to make the commitments because they are so concerned about the potential pressures, competitive pressures from Japan.

In other words, this notion that we can stand up in the long term and continue to see our standard of living improve I think has real problems with it. But I also want to put a positive note on it. As one leader in the semiconductor industry said to me a decade ago, if the Japanese hadn't come along, we would have had to have invented them.

Representative HAMILTON. Well, we've gotten better in automobile making, haven't we, because the Japanese came along?

Mr. FINAN. Absolutely, and in an area, for example, like semiconductors, a study that we did for the National Institutes of Technology. We found that over the decade of the 1980s we improved dramatically in quality control assurance practices in the semiconductor industry. We're world class. We are equal or better than the Japanese in some areas there, and that's strictly due to the fact that the Japanese set the benchmarks and we had to equal or better them.

Mr. FLAMM. I just want to make a couple of observations.

First of all, if you had asked your question—not about the United States, about how good the direct foreign investment from Japan is for the United States—if you had asked that question in the United States in the late 1960s of course, you would have gotten a very different answer. In that case the issue would have been U.S. direct investment coming into Europe, and we had no doubt whatsoever, of course, that it was a very good thing for Europe. The Europeans had some doubt, but of course we knew the answer back then. It was clearly a good thing for them.

Now that the shoe is on the other foot, of course, people are beginning to raise the very same disquiet that the Europeans raised back when U.S. investment was coming in. But the reason I say that is that you have to realize that the issue is not whether Japa-

nese investment in the United States should be received without any restrictions or not. The issue is whether we want an international trade regime which is going to restrict direct foreign investment, because if we start restricting Japanese investments in the U.S., the very same sauce is going to be applied to our gander in Europe and Brazil and Southeast Asia and a whole lot of other places.

Representative HAMILTON. So we ought not to have any restrictions.

Mr. FLAMM. Well, no, that's not what I'm saying. I'm pointing out that we have a vested interest in investment just as much as the Japanese do in penetrating our market. The point I would like to raise is that what we're really talking about here is coming up with some kind of system that is going to work for everybody, some set of rules that you can apply to the Japanese and the Americans and the Europeans or whatever, and everybody is going to feel they have a stake in the system and a fair chance.

It seems to me that, ultimately, is the path we face right now, that if we play the same game the Japanese play, if they have access to our markets and we have access to their markets, we fund R&D and they fund R&D, and we lose out—our standard of living declines because we don't invest in our work force, because we don't organize to invest in technology in a very efficient or directed way—then it's our fault. We don't have any business pointing our fingers at the Japanese and saying fie on you.

Representative HAMILTON. Do you think we're moving in a favorable direction in that regard?

Mr. FLAMM. Well, I think the issues are certainly being talked about more than they were before, and certainly the verbal trends are positive. I see a lot less action than I see words. But to continue, I mean at what point will we have to sit back and say the problem is not unfair practices on the other side, but the problem is what we are doing.

It seems to me the point at which we will be forced to say that is when basically there is common agreement that everyone is playing by the same rules and we are either winning or losing.

So it seems to me the fundamental task we have is come up with some common set of rules in this area in high-technology that everybody feels are more or less fair, and then let the better man win, let the better man fight, and let's get organized and do the best job we can to compete.

We were insulated from competition for most of the post-war decade by the fact that our industrial competitors were in recovery from the damage of a world war. Now we have competition out there. That is what the American model is about, competition. So if we have some common set of rules that everybody can sign off on, well let the fur fly, let the better man win and let the standard of living of all improve as a consequence of competition.

Representative HAMILTON. Well, I'll come back to that in a minute, and I want to turn to Senator Bingaman again.

On this question of the challenge, I want to get your reactions to technology itself. Are the Japanese outrunning us in technology, are they better than we are, are we ahead, but they are gaining, or

are they ahead? How do you line this up anyway, the Japanese technology? What is your overall assessment?

Ms. HARRIS. Well, I think it's a mixed picture. Each of these many studies that is done shows some areas where we're ahead and some behind. But the overall pattern I think is for Japan to be taking increasing leadership in many of the fields of advanced technology. We see evidence in the patent data and we see it in trade and high technology products, we see this in many, many areas.

Representative HAMILTON. You heard that report I cited in my opening statement?

Ms. HARRIS. Yes.

Representative HAMILTON. Do you agree basically with that? Do you think that's an accurate assessment? We're not leading anywhere in that assessment.

Ms. HARRIS. In that assessment there were nine where we were still——

Representative HAMILTON. Losing badly to Japan in four, losing in six, holding our own in two and leading in none. Is that too pessimistic or is that about the way you feel about it?

Ms. HARRIS. As I recall, that study was a study of emerging technologies looking specifically ahead to the future, and in that regard I think it's meaningful, but it certainly doesn't represent the broad base of technologies here. I think there are many areas where we see American firms putting in new efforts and trying new kinds of things in terms of how they are treating their engineers and how they are building new strategies.

I want to be more optimistic than to leave you with the impression, Congressman Hamilton, that there is no hope here. I just think that it requires a tremendous effort. It's like the foreign investment issue. I think you really come down to the question of how can we make these things work for us.

Representative HAMILTON. Dr. Finan, how do you feel about this comparative position of the United States and Japan in technology?

Mr. FINAN. I first participated in an exercise like that about eight years ago, and when we presented the results at the Cabinet level in fact they were basically rejected.

Representative HAMILTON. They were what?

Mr. FINAN. They were rejected. People simply didn't believe that we didn't have perhaps a picture that was as black as the one that was painted in the report you cited. At that time we noticed a number of areas where Japan was pulling ahead and others where they had the promise to pull ahead, and people found it very difficult to accept, and I think people even today have a difficult time accepting it.

It isn't a question of whether they are ahead in eight and equal in six and so on. It's not a ball game per se. But it's a general change of structural relationships that is indicative in those numbers.

I think it says that if we don't make compensating institutional changes here, we are in fact going to be spending, you know, we'll be back here 10 years from now and we'll be wondering, you know, what can we do about it, and we'll have less capacity and less le-

verage, and that's a very important question with the Japanese, we'll have less leverage to change things.

Representative HAMILTON. I want to be sure I understood you. You mean it doesn't matter whether we're ahead or behind in advanced materials?

Mr. FINAN. Not the numbers. I'm just saying it's not like I would feel more comfortable if we were equal in six or ahead in six and they were ahead in six. I'm just saying it's a very important trend and we shouldn't put excessive emphasis on the accuracy of the counting, but merely understand the indicative fact that it's telling us, that the change is broad. Our political leadership, our business leadership and our academic leaders have to in turn inspect the existing institutional relationships and change. And the question is whether we can change as fast and as effectively as the Japanese have done.

Representative HAMILTON. So if I understand then, you see the Japanese position with regard to technology in general as a very formidable challenge to the United States?

Mr. FINAN. Absolutely. I think it is one that—you know, traditional reactions to problems won't work any more, and let me give you an example in the machine tool area. The issue there is the industry was concerned with a tremendous erosion in their capabilities.

The Defense Department and other agencies argued that we should restrain Japanese imports in order that we would increase the technological level of our industry. That is, the machine tools here were technologically inferior, so an import restriction was considered to be in the national security interests of the U.S.

Now about that time I had a discussion with a gentleman out in the Lawrence Livermore Laboratories who explained to me that in order to grind the most advanced prototype for a certain thing, and I can't say what it was, they had to rely upon a machine tool provided to them by Toyota. Where did Toyota get the machine tool? It came out of a joint development project that MITI funded.

Now what is part of the lesson here? Well, the traditional reaction of the U.S. to use an import restraint to increase technological capability was absolutely wrong. It wasn't going to get the outcome that you wanted to have happen. We have to change. We can't do the same reactions we used to rely on.

Representative HAMILTON. I want to come back to that change business in a minute.

Senator Bingaman.

Senator BINGAMAN. Let me just follow up on that. You say it's absolutely wrong to use an import restriction to try to improve the technology level in that example. My understanding is that for many years and decades the Japanese method of developing technology and manufacturing capability in high tech products was to essentially restrict access to their market. I mean instead of allowing us to sell directly into their market, they would say U.S. firm or foreign firm, you must license to a Japanese firm or you just joint venture with the Japanese firm or you must do something so that we develop the domestic competence in this technology or otherwise you're not selling it over here.

Now what is wrong with us doing the same thing to them in areas where they are ahead?

Mr. FINAN. They are going to be a little smarter than we were.

Senator BINGAMAN. They are going to be smarter in the sense that they aren't going to sell.

Mr. FINAN. Well, in the sense that—at that point in time we were arrogant and we said, oh, yeah, if we were not allowed to actually directly participate in the market, let's license, let's do a joint venture, they are never going to overtake our capabilities in the long run.

As the example I mentioned with the MOU shows, the Japanese are very keenly sensitive to giving up technical knowledge. They strongly believe if they give it up to us, we'll improve on it and they won't receive any benefits from that.

Senator BINGAMAN. Now what are you suggesting, that they would give up the U.S. markets rather than do with us what we required or what we were required to do with them? Is that what you're saying?

Mr. FINAN. Well, in other words, I think at the time, the 1950s, 1960s period we're talking about, this licensing process, the stripping of the technology went on and, in other words, the story plays out because we gave them the wherewithal to manufacture in Japan something equivalent to what we could have supplied them with and they paid a cost for that. It was an expensive lesson. Both the licensing fees were expensive and they probably weren't getting the scale of benefits. But they paid that price because they looked down the road and they said——

Senator BINGAMAN. It was a bargain.

Mr. FINAN [continuing]. It was a bargain in the long run, exactly. In the long run it was a bargain.

Senator BINGAMAN. Now you suggested——

Mr. FINAN. But let's flip it around.

Senator BINGAMAN. OK, go ahead.

Mr. FINAN. If we flip it around and we say well, let's impose an import restriction on the imports of machine tools, that's a very different story we're playing out because we are not saying strip the technology out of Japan, insert it in a U.S. firm here, nurture that firm to advance its capabilities such that five years from now or a longer term, if it's take longer to go through the process of development, they will be competitive on the world market.

The Japanese ultimately use the acid test of being able to compete worldwide for the success or failure of a program. They don't care whether it takes five years or longer, that's the acid test that they judge success by.

We might judge success very differently. We would say well, we cut down the import share of our market this year. Well, what's our objective function here? If the objective function is to increase technical knowhow in the United States, we haven't succeeded in the long run, but we haven't tried any of these techniques that the Japanese tried on us as far as restricting access to their market unless we would agree to joint venture or license or do something to give them the ability to develop a domestic capability in this area.

I guess what I'm saying, and your suggestion in your statement was that we do that exact thing with regard to those items sold to the U.S. Government or at least to the U.S. Defense Department and that we now allow those items to be sold to the Defense Department unless they agree to develop a second source in this country.

But that's much less of a restriction into our market than what they imposed on us in their market, and I guess I'm just wondering why what's good for the goose isn't good for the gander at this point if there are areas where they are clearly ahead in high technology products. Your example of a machine tool I think may not be an appropriate one in that it is a one-of-a-kind kind of an instrument.

I'm talking about instruments where they are selling them in volume and where the best market in the world for them is the U.S. In that circumstance why isn't it to our advantage to say we would like to have you sell in our country, but we want to be sure that we also have the competence and capability to manufacture these products, and therefore we are going to require of you the same thing you required of us back when we were the only ones with that competence.

Dr. Flamm.

Mr. FLAMM. Could I just make one comment on that. It's a tempting proposal. I mean it certainly sounds good in areas where we are behind Japan. But let me just point out that once you start going down this road, then you have to start asking other somewhat more difficult questions. What about when the Brazilians say that to the U.S. computer industry? Well, you're ahead in this particular technology, and we would like joint ventures in Brazil, not U.S. controlled foreign subsidiaries, or the Europeans for that matter saying that you're ahead in this technology and we would like to transfer via joint ventures and we're going to restrict direct foreign investment.

Senator BINGAMAN. But that's a bilateral arrangement. What I'm saying is that we work out a bilateral arrangement with Japan which may have one set of rules because of the way Japan does business with us in these areas, and we have a different bilateral arrangement with Brazil if they are willing to operate by different rules.

Mr. FLAMM. Well, you're suggesting a pretty radical change then. You're suggesting moving away from where we've been going, that is a multilateral system where everybody basically agrees to play by the same rules.

Senator BINGAMAN. I'm just saying that we've been going there, but maybe the Japanese haven't.

[Laughter.]

Mr. FLAMM. Well, I think the rate of change, the first derivative of Japan is certainly towards a more open system. I still think the level, the absolute level is quite a ways from an open system.

So the question is do you throw up your hands and say, you know, I give up, we're not going to try to kick and cajole and push them more in the direction of being full partners in an open system? You know, we acknowledge the fact that an open trading

system is good-bye, gone forever, and we're just going to cut the best deal——

Senator BINGAMAN. Oh, I don't think you do anything forever. You just say, look, this seems to be the situation we are faced with today in 1990 or 1991, which we are soon into, and say under these circumstances, you know, we're going to have to do the same thing to you that you have historically done to us and continue to do to us in certain areas where we are in the lead.

Mr. FLAMM. That is the way to phrase it if you're going to come up with a proposal like that. Say that we're going to retaliate with restrictions in particular areas where we can show your continued deviation from the rules of the game as commonly agreed upon in other particular sectors.

So when—and I was about to say Slim Pickins—but when Boone Pickins is over there—— [Laughter.] Slim Pickins, too, for that matter—— [Laughter.] ——complaining about his access to the financial markets, you know, we're perfectly justified in saying to Japan, look, if you want to invest in the United States, then we expect a reciprocal degree of access to the Japanese market. We are not deviating from what we perceive the roles of the game to be in which everyone should be moving, but we are going to take on a case-by-case basis retaliation for specific examples and complaints.

Senator BINGAMAN. I'm arguing that in high technology products there may be more of a national goal or a national need to do this kind of thing than there may be in the case of Boone Pickins' company. I mean I tend to believe that we ought to have as much access to invest in Japan as they have here, and I agree, that's another place we ought to have a two-way street.

But in high technology products in particular if in fact we are not able to sell super-computers into their market, and I guess we're now doing more of that, but to the extent we cannot sell a particular item into their market or satellites or whatever, then we pick out an area where they are ahead and say you can't sell those over here.

Mr. FLAMM. That's great. That's called hard-ball tactics.

Senator BINGAMAN. Right. Instead of having structural talks about how we ought to improve our educational system and they ought to improve their distribution system, I mean I don't see that that gets us anywhere.

Mr. FLAMM. I agree with you, but I think we ought to bear two things firmly in mind when we go along the route you're talking about.

No. 1, where are we going to? I mean what is the ultimate objective? How can we put together a system that is going to work, what are the rules of that system going to look like, and can we get everyone to agree on it and move in that direction? I think that's goal No. 1.

No. 2, when we talk about particular sectoral issues of retaliation or sanctions or whatever you're talking about in this case, restrictions on Japanese investment as retaliation, we ought to make it clear that those particular sanctions or measures are not just, you know, case-by-case responses to pressure from U.S. industries that are in a pickle for one reason or another, because if we go that

route, the Japanese are just going to nickel and dime and wear us down on these really minute, and they are not so minute sometimes, but these sector-by-sector issues without getting at the real root problems, and the real root problem is is there an open market here, are there some common minimal set of standards for competition and are they being observed? I think that there ought to be some overall logic and conception and guiding force behind our positions.

Senator BINGAMAN. But I don't think it's that tough to come to the closure on an overall logic in the high technology area. I mean if you just take out that piece and quit arguing about rice and quit arguing about these things which are sort of symbolic of national something, but actually get into high technology products and say we've got a tremendous imbalance here, and it has in part developed because of restrictions that the Japanese have imposed on high technology manufactured products coming into their market. In order that we maintain our competence in those products, we're going to impose similar restrictions on a selective basis to ensure that we've got an open system, and you basically say you agree with that.

Mr. FLAMM. Well, I agree with that, but I think the use of a tool like that ought to be linked to the construction of the system. It shouldn't be just that we're behind in computers and therefore we're going to restrict computers, or we're behind in machine tools and we are going to restrict machine tools.

That, it seems to me, just leads to a breakdown of world order, if you will, in the trading system——

Senator BINGAMAN. Oh, I agree.

Mr. FLAMM [continuing]. And it's going to rebound on us.

Senator BINGAMAN. I agree. I think we should have a long-term goal of having an open system, and that's what you're arguing for, and I totally agree. I just say that if we wait until that evolves without playing some of this hard ball that you have called it, I think we're going to wait a long time.

Mr. FLAMM. Right. I don't disagree.

Representative HAMILTON. Where are you going to do all of this, Dr. Flamm? I mean you want to move to this open trading system, international standards and reciprocity and access and all of that. What is the forum for that? Do you put that on the GATT agenda?

Mr. FLAMM. Well, I think there are forces at work already that are moving in that direction, and let me just tell you what a few of them are I think.

No. 1, the Europeans are now a single economic block and speak with one voice, and in some sense I think you could argue what the Europeans have done internally within Europe in some ways is a model for how you could have a larger community pledged to a common set of rules. What have the Europeans got?

Well, No. 1, they have in effect a system of regionalized research subsidies now that prevent or have neutralized to some extent the ability of France to aid French firms at the expense of British firms. They've got a minimum standard for antitrust policy within the community so that everybody is playing by the same rules. The German firms don't have a leg up because of their cozy relation-

ship with the German banks and behind-the-scenes maneuverings without running into the EC Commissioner for Antitrust.

If you could take that model and expand it on an international basis—you know, after World War II and the present international trading system as set up people talked about an international trade organization, an organization charged with developing minimal standards for competitive behavior and market-like functions in its member states.

Representative HAMILTON. You're not suggesting using GATT?

Mr. FLAMM. I think GATT has to be expanded. Right now there is a proposal afoot and responsible parties are talking about using the OECD, adding a new function, for example, to the OECD and having some kind of police authority within the OECD to negotiate some kind of common code of conduct for markets, including things like investment, intervention, subsidies of all sorts and antitrust policy, and I think over the long haul that's really the only way to go.

If we don't come up with some common set of standards and rules for trade and for markets, we're going to end up with every man for himself and the law of the jungle. And despite all the pessimistic talk about how far we are behind in this sector and that sector, and I will grant you that we are now lagging Japan in a number of sectors, let's not forget that we're ahead in an awful lot of sectors still. Our aerospace industry is the best in the world despite this trend here.

By the way, I would observe that those many losing sectors are not really referring to the overall state of those sectors, but they are referring to the trends. So when you say losing badly here, what it means is that our rate of change is not as high as the Japanese, and not that our biotechnology industry, for example, is badly behind the Japanese because that's absurd, and not that our high performance computing industry is behind that of the Japanese because that is also absurd. It means that the Japanese are improving faster than us, but they are still behind us.

So we have a lot of sectors in which we are very competitive, and once you go down the route of, you know, anything is fair, I mean any sector you're behind, restrictions are okay, we're going to end up on the losing side of a lot of those policies.

Representative HAMILTON. I'm still interested in GATT.

Mr. FLAMM. I'm sorry.

Representative HAMILTON. You don't think GATT is the institution. I'm looking for the institutional way to achieve what you desire in moving this towards this open trading system.

Mr. FLAMM. Two ways. One, I think GATT has to be augmented. I think there is an additional organization that is required, for example, charged with implementing and enforcing some common set of antitrust and competitive standards. That's one thing. I think that has to be added onto GATT. You know, if you want to house it in the same building as GATT, fine, I don't think that's an issue, but there is an additional structure that is needed.

No. 2, we have these various bilateral issues with Japan. Why not change them from nickel and dime wearing down the other side kind of things to something with a bigger agenda in mind and use them, because the Japanese care about these issues, they care

about the semiconductor industry and they care about electronics sales in the U.S., and make it clear that we're linking that to movement towards a system in Japan that's closer to what is envisioned in the world trading system at the moment.

Representative HAMILTON. Let me switch over to research and development now. I think both countries put about the same percentage of their GNP into R&D, but the difference really is that the Japanese do a lot more of it privately. We do about 50–50 private-public, and they do about 80–20 as I understand it. You might check to see if you agree with that.

Why is it that the Japanese have a much higher level of R&D support from the private sector than we do?

Ms. HARRIS. I would like to take that question first, but at some point I would appreciate an opportunity to respond on some of those earlier issues about restrictions and how we might go.

Representative HAMILTON. I'll give everybody a closing statement at the end and you can put anything you want to in that.

[Laughter.]

Ms. HARRIS. OK. Thank you.

I think one of the reasons why the Japanese companies are so strong in terms of their R&D investments is that they have really come to make this a central part of their corporate strategy. In a sense the obverse is the, you know, the kind of weak and limited contributions on the government side. The process is more one of leveraging resources than one of direct financial support from the government as being the key to the government's role in their R&D system.

Representative HAMILTON. And the Americans don't?

Ms. HARRIS. I think the Americans do some of that, we Americans do some of that, but I think the Japanese have made that more of a hallmark of the approach that they've taken.

I think another very important thing that we have to keep in mind is that if you look at non-defense R&D, civilian R&D, Japan is a full percentage point above us in terms of GNP devoted to R&D in the civilian sector.

Representative HAMILTON. Is one of the reasons we're having a problem in the technology race because so much of their R&D is civilian and so much of our R&D is military?

Ms. HARRIS. I think that that would be an oversimplification. I do think that as we look ahead to the future, however, what we are going to see, and what we are already seeing is that Japan's strengths in the civilian industry side in what we would call dual use technology will be tremendously important not only for their industrial civilian competitiveness, but also for military systems as well.

Representative HAMILTON. If you look at the very best of our Ph.D. candidates coming out of the very top-flight American schools today in science and technology, where are they going?

Mr. FINAN. Abroad.

Representative HAMILTON. Going where?

Mr. FINAN. Back home.

[Laughter.]

Representative HAMILTON. You mean the very best ones are foreign?

Mr. FINAN. Yes.

Representative HAMILTON. And they are not staying here?

Mr. FINAN. In certain areas I think that's true.

Representative HAMILTON. Well, let's talk about the American Ph.Ds., the really cutting edge. The reason I happened to think of the question is I was out at Livermore Laboratories one time some years ago now, and a young Ph.D. right out of Berkeley was heading up a hundred million dollar project. He was 25 and had thousands of people working for him. You could just see the excitement in his eyes. He was right on the cutting edge of technology. He was taking everything he learned right out of graduate school and his Ph.D. thesis and he was beginning to push the frontiers. He was on the cutting edge and there was excitement there, and he was attracting, he said, the very best graduates of MIT and California Institute and all the rest of them.

I'm just wondering where these people are going today. Are they going into civilian research, what kind of civilian research in this country, or are they going into military research? Where are they going?

Mr. FINAN. I can't give you a decisive answer, but I would say when you go into recession, they will tend to go into military research if DOD continues to fund research. That's traditional and during a down cycle you'll see that happen. There are layoffs and there are spending cutbacks anticipated, and the areas that I'm familiar with tend to be in the electronics oriented industries. You'll see the slow down affect the budgeting process from 1991 and beyond.

Representative HAMILTON. Are you worried about the fact that so many of our Ph.Ds. in the sciences are foreign born?

Mr. FINAN. It's not so much that, you know, but I'll say yes, and more and more. I used to not worry about it because they stayed here.

I really woke up to things when I made a trip to Korea that was particularly an eye-opener. All the engineers I encountered that were running their fabrication facilities for semiconductors were American-trained engineers with 5 years or 8 years in the business here and they went back. The Taiwanese semiconductor industry has been trained by us, and so on and so forth.

There is far more, if you want to call it leakage, faster return cycling back to the home country today than there has ever been, and yet at the same time the electronics industry, just focusing on that, is highly dependent upon a naturalized citizen engineering base. That is, we could not move ahead without foreign engineers in our research labs.

Representative HAMILTON. One of you were commenting in your testimony about we don't go to Japan, but Japan comes here and they learn a lot more from us than we learn from them, or at least that is the impression I got. That's pretty standard I guess. Is that an accurate impression you were conveying there?

Ms. HARRIS. I would agree with that overall in a general sense.

Mr. FINAN. Yes, that's correct.

Representative HAMILTON. And why don't we learn more from the Japanese?

Ms. HARRIS. Well, there are so many answers. The language barrier is one of course. We have fewer people who study the language. Of course, you can go to Japan and work in a lab and not speak Japanese, but you don't get as far if you have that language facility. That's just one issue.

Representative HAMILTON. Well, let's take this matter of manufacturing technology. I mean we hear a lot about the fact that we still have the innovators, we still have the creativity, we develop the product and all the rest, but we can't manufacture it as well as the Japanese do. That's something we've heard frequently on this Committee.

Now if you're a manufacturer in America and that's the situation, why wouldn't it occur to you to send some people over there to learn how they're doing it?

Ms. HARRIS. Well, because you might be engaged in very intense competition and find that it would be tough to find the resources, and you would wonder about——

Representative HAMILTON. Would the Japanese shut us out?

Ms. HARRIS. I don't think so. I mean there may be areas now where it would be difficult to send someone, but there are other fields like electronics where some of the major companies have opened up their labs to foreign researchers.

I think the question then becomes the quality of the experience. I think it also has to do with the resources you have to invest in order to get there. And as Dr. Finan mentioned earlier, the costs of being in Japan can be very, very high.

I tend to look at cooperative efforts, like even the American Electronics Association's office in Tokyo as being one that is particularly important because there what you're getting is knowledge and information that diffuses through an American industry, and I think it's those kinds of mechanisms that are especially important to develop on a company-by-company basis.

If you look at our premier companies, they know how to learn from Japan. They are there and they are doing it every day. In fact, the Japanese consider them part of the scene. The problem is that that is not all of our manufacturing sector.

Representative HAMILTON. Look, if you're putting this on a chart and you're showing technology flowing from Japan to the United States here and down here you're showing it the other way from the United States to Japan, and the wider the arrow the more the flow, how would that chart look? I mean is today a massive amount of technology moving from the United States to Japan and very little from Japan to the United States, or is roughly equal or what does it look like?

Ms. HARRIS. I wish I had the chart.

[Laughter.]

Mr. FINAN. Where are your staff people?

[Laughter.]

Representative HAMILTON. You want them to develop the chart.

Ms. HARRIS. I think you would see a very complicated exchange process going on. By and large if you look at areas like licensing and royalties, you know, if that is the arrow you draw, it's still going to be a pretty big arrow from the U.S. to Japan. But if you look into some other fields like the intra-firm rotation of engineers

and scientists who spend some time in Japan and then come back to the U.S. and vice versa, I think that there is learning going on at that level.

Representative HAMILTON. We had one of the economists testify the other day with regard to joint ventures. She thought the flow was more towards the United States now than the other way around.

Mr. FINAN. Let me touch on a couple of the questions you've asked just going back to the qualitative issue of flow. My personal belief is the quality of the flow of technical knowhow out of the U.S. to Japan relatively speaking is diminishing; that is, they need us less and less. And I think the flow coming out of Japan to the U.S. is increasing for a variety of reasons. We're putting more people in the field that know Japanese, we've spent more time thinking about it, joint ventures is perhaps a reason and a number of businesses now structure joint ventures with a notion that they want to extract knowhow as a goal, whereas historically that might not have been.

Let me go back to the question that you asked about the R&D and the defense and non-defense distribution, and here I would, with all due respect, suggest you might want to have the staff of the Committee do some research into the structure of those accounts in the United States and Japan.

In research that we've done, when we've gone to companies in Japan and asked them about the budgets for R&D, what we will find is a number of people who are so-called on the budget of the labs are in fact in the manufacturing facilities.

This notion of accounting, you know, sort of the reliability of the numbers notion might be somewhat suspect, but I think there is an educational process there because what you would find is the R&D mix is a lot of D in Japan and less R, and D coupled in with something that we don't even talk about per se in that mix which is commercialization.

As Martha mentioned earlier, they worry at all times what the applicability is of what they are doing to the market. I would talk to researchers in the central or so-called basic research labs who were doing projects with time horizons of 8 to 10 years down the road, but they always were looking to what market were they ultimately coupling into. It was very clear they knew where they were going.

Representative HAMILTON. Dr. Flamm, do you want to comment on this role of technology?

Mr. FLAMM. I would exercise my right to artistic license and say that if I had to guess what the arrows looked like, the way I would put it is I would compare the chart today to the chart 10 years ago, and I think the arrow from Japan is definitely considerably thicker today in terms of Japanese technology coming to the U.S. than it was.

I think one of the reasons for that is that there has been a fairly substantial increase in the level of R&D activity by U.S. firms in Japanese facilities just over the last few years. U.S. firms are increasingly aware that they have to tap into Japanese R&D in much the same way that Japanese firms historically tapped into U.S. R&D and they are doing something about it.

Again, the point on joint ventures is a valuable one, too. I think there is a fair amount of technology. For example, a company Bill knows well, Texas Instruments, their Japanese facility is the main development facility for their memory chips worldwide, or Kodak, which now has set up a Japanese facility to tap into Japanese expertise in things like charge-coupled devices.

So I think there is a lot of technology that is flowing the other way now. Now whether the balance between the two arrows now is still tipped in the Japanese direction or the U.S. direction is a very difficult question, but certainly the Japanese arrow I think has gotten substantially thicker over time.

Representative HAMILTON. Let me ask you about the role of the U.S. Government in these matters. Is the Federal Government now supporting sufficient R&D in these technologies with industrial application? You wrote a book on this, didn't you, or something on this, Targeting the Computer?

Mr. FLAMM. Yes. Well, I was struck by the example you gave earlier of your bright-eyed, bushy-tailed Ph.D. at Lawrence Livermore. What was he working on is my question for you, a new widget for U.S. industry or a nuclear weapon design? I think the answer is obvious, or not necessarily obvious, but I guess the probabilities favor the latter and not the former.

Representative HAMILTON. Well, we have a rule around here that you can't ask us questions.

[Laughter.]

Senator BINGAMAN. Because we don't know the answers.

[Laughter.]

Mr. FLAMM. Well, but I think that's part of the syndrome. You know, the Defense Department makes up an enormous chunk of the U.S. investment in research and development, and I think if you went back to the 1950s or even the 1960s, a lot of more of that R&D dollar being spent by the Defense Department was relevant to commercially relevant things because many of the technologies that were being developed then were pretty much in their infancy. When you built computer No. 1, it was going to have much more relevance for commercial industry than when you develop a very specialized fire control computer for a jet fighter today in terms of what the spillover and spinoff is going to be for industry.

So many of the technologies that DOD is investing in are much more mature today, whereas in the 1950s and 1960s there was a lot more spillover.

Second, if you look at what DOD is spending its R&D dollars on, there has been a fairly significant decline in the R part of the R&D in percentage terms. A lot more of it is development, very specialized stuff for particular niches of military needs and much less on generic spending on research.

If you look, for example, at——

Representative HAMILTON. There is less of a civilian spinoff then.

Mr. FLAMM. Yes. I think the general opinion of economists who have studied the issues in R&D investment is that basic research and research in general is much more likely to have commercial spillovers than investments in very, and there is no hard and fast rule, but in general much more spillover than investment in very

specialized systems for very arcane niches in say a military system, radiation hardening or temperature resistance.

Representative HAMILTON. Well, we've got DARPA, and how is DARPA doing? I mean is that something that ought to be considerably expanded or contracted or refocused? What's your view about DARPA?

Mr. FLAMM. Well, who is DARPA's client? I mean there is a history behind DARPA, and the history of DARPA is that when it gets too far out of line from the agenda of those who run the military, particularly in times of tight budget, it gets reined in, and I think there was a period of reining in the early 1980s, and it may be going through a period of reining in today, I don't know.

On the other hand, there is a lot of pressure from the Hill from you folks to make DARPA's spending a lot more relevant to commercial technologies, and is that going to have a substantial effect? I don't know.

I do think that the general idea of spending a lot more resources on pre-commercial technology development that is likely to have commercial spillover is something that we ought to be talking very seriously about.

Representative HAMILTON. And you favor?

Mr. FLAMM. Absolutely.

Representative HAMILTON. And do you, Dr. Finan?

Mr. FINAN. Yes, I do.

Representative HAMILTON. And do you, Dr. Harris?

Ms. HARRIS. Yes.

Representative HAMILTON. And you're not worried about the government picking winners and losers?

Mr. FINAN. I wouldn't lose sleep over it. I would be worried about them picking too many losers.

[Laughter.]

Well, technology development is risk, and that's unfortunately something that the people don't always feel comfortable living with, but as long as people realize there are winners and losers naturally occurring in that process, then yes.

Mr. FLAMM. Plus I think there are ways you could structure a program to avoid making it into pork barrel, which I think is the greatest danger it runs. I think there are ways to build incentives into the program to avoid things that really aren't going to have a lot of commercial impact or aren't really productive investments.

Representative HAMILTON. Well, I think I've run out of time here and I regret that. I really have a lot more questions. We've had a very stimulating afternoon, and we have appreciated your observations and your testimony.

You have no further comments, Senator?

Senator BINGAMAN. No.

Representative HAMILTON. We stand adjourned.

[The Committee adjourned at 3:40 p.m., subject to the call of the Chair.]

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