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POLITICS AND PRODUCTIVITY: Developmental
Strategy and Production Innovation in Japan

Laura D'Andrea Tyson,
and
John Zysman

November 1987

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POLICY, MARKETS, AND PRODUCTIVITY: THE THREE TIERS

In the late 1970s America discovered Japan. We discovered that they made more than textiles and cheap televisions. As robots captured the attention of the press, we had to recognize that American pre-eminence in industrial manufacturing was being challenged by fundamental production innovations that permitted the Japanese to gain advantage in a range of sectors from consumer electronics to machine tools and automobiles. Suddenly we began to try to understand the Japanese miracle and find policies to respond. A stream of books sought the source of Japanese success variously in management styles, worker attitudes, government subsidy, and business state relationships. A small industry grew up to explain the success of the Japanese economy. There have been several alternative categories of explanation: cultural arguments that concentrate on features of Japanese management style and the attitudes of Japanese workers; institutional arguments that focus on production cartels, lax or relaxed rules for anti-trust, and MITI; economic arguments that consider such things as high savings rates and the convoluted workings of the distribution system; and political arguments that point to the concerted political will required to mobilize the state policy supporting and promoting growth. In our opinion, no one of these elements in and of itself was critical to the success of Japanese policy. Rather, it is the web of policies and the purposes to which the elements are put that we must understand.

Too often cartoon-like images dominate debates about the roots of Japanese economic success. Many of these images are incompatible. Each emphasizes to the point of exaggeration one aspect or element of Japanese experience. Policy analysts and academics alike have often selected and emphasized material to force the Japanese case to fit their preferences for the United States. A few years ago, the cartoon-image of Japan Inc. claimed that the government dictated and shaped the course of development with a limited role for the private sector. Another cartoon-image highlights the role of market forces and of private management, seeking to underplay or discount the role of government. Similarly, in attempting to suggest the extent of recent change in Japan, some analysts seem to claim that the Japanese market has never really been closed to outsiders or that closure has not been critical. Others contend that closure has been decisive in international competition. One image highlights giant corporations, another small flexible manufacturing. The result of selecting facts to fit pre-existing explanations has been a series of caricatures. Certainly some of the arguments are simply contradictory, that is we have to choose between them. For the most part, however, the task is not to select between competing explanations, but to understand how elements of the Japanese system fit together.

Why the stream of caricatures? Perhaps because it has been most difficult for America to recognize that there are different national economic strategies, each representing a different way of organizing a capitalist marketplace. It has been difficult to acknowledge that there is more than one form of capitalism, more than one way of

structuring business state relations in a democratic society with a marketplace economy.

The view presented here is that the Japanese government has pursued a conscious strategy of industrial development that has influenced its patterns of domestic growth and international trade. The argument demonstrates how the government influenced and shaped the dynamics of a highly competitive market system. The policies created intense, but controlled, competition. Competitive markets induced the investment that underlay rapid growth and manufacturing innovation. The particular character of the interplay between policy, markets, and corporate strategy created and continue to sustain a particular logic to the pattern of Japanese trade.

Government, markets, and interest groups cannot be disentangled in the story, or unbundled in the analysis. Economists assume that a market consisting of a few large firms will behave differently than a market composed of many small ones. Indeed, an entire subfield of industrial organization exists to examine the link between different market structures and industrial behavior. Yet there is little analysis of the way the institutional structure of the economy shapes industrial behavior, and the absence of such analysis limits our understanding of how modern economies work.¹

Markets do not exist apart from the rules and the institutional settings in which they operate. There are rules which structure how buying and selling take place. The institutions of finance and the organization of labor alter the way firms can operate in capital and labor markets. The relations between governments and business and among businesses are organized differently in each nation, and

consequently the dynamics of markets are different. Political scientists now debate how to characterize these relationships, using notions such as strong/or weak state, "policy compacts", state led growth, and corporatism.² However, they rarely try to establish that these relationships, however characterized, shape market behavior. Economists, by contrast, generally ignore or caricature the role of institutions and proceed with their analysis as if institutions didn't exist and as if history didn't matter. In this work we try to avoid some of the pitfalls of standard political science and standard economics by integrating an analysis of policy and institutional relations with an analysis of market behavior.

The argument is built in tiers. The argument in the first tier is not controversial or new. The Japanese government dominated in the years after World War II by a conservative coalition used the institutions of a centralized state to create a developmental policy. Crucial elements of market arrangements that facilitated rapid adjustment and growth were the product of conscious choice in the post-war years and were not carryovers embedded in Japanese cultural traditions. The system constructed by a policy elite with its stronghold in the state bureaucracy was meant to rebuild Japan's economic position. Policy choices profoundly affected the dynamics of domestic markets in Japan.

The second tier contends that the policy of domestic promotion and external protection in an industry structure composed at once of large firms and large integrated groups and layers of small firms generated an intense investment driven competition for market share. As a result of competing for market share while borrowing technology

from abroad, Japanese firms developed a characteristic pattern of continuous production innovation.

The third tier proposes that the system of domestic development, with its market dynamics created and reinforced by policy, produced particular features of Japan's pattern of international trade. The hypothesis is that the pattern of policy generated specific trade outcomes, that it gave a distinct character to Japanese trade in manufactures, because it made access to Japan's market uniquely difficult.

This three tier analysis permits us to consider the nature of the present opening of the Japanese economy. Since the mid-seventies the Japanese government has sought to liberalize the economy and to dismantle the structure of protection. Indeed, it has removed quotas and lowered tariffs, and these measures have left Japan with low levels of overt trade restriction. Yet claims of market closure and domestic promotion persist.

The question is not whether the economy is opening or becoming more entangled in international markets. It is. The critical questions are how much of the developmental structure remains in place and how much needs to stay in place for Japan to sustain its international market position, or more precisely to sustain its trajectory of advance. The arguments offered in this paper suggest that real openness has been established where it least matters, in sectors where Japanese producers already have a dominant domestic position. In sectors where Japanese policy makers and industrialists may wish to establish or re-establish advantage real protection remains.

Any discussion of Japan's post-war success must be put in the perspective of longer term industrial growth that began in the 19th century.³ Industrialization was initially built on textiles, as has been the case in so many places. Beginning in the 1930s there was a long upward swing that rested on borrowed technology and cheap labor, which rooted Japan firmly in heavier industries. In a sense that phase of Japan's development was simply interrupted by WORLD WAR II.⁴ The pre-war and post-war period, moreover, shared a focus on self reliant domestic development. In the 1930s that took the form of an imperium and Japanese partial withdrawal from the world economic system. The post-war neo-mercantilism which is emphasized here preserved the combination of insulated domestic markets and borrowed foreign technology.

THE FIRST TIER:
THE BASIS OF A DEVELOPMENTAL STRATEGY

Our central position bears repeating. Japanese government policy for development created an intense but controlled competition in a protected market. The particular logic of that competition provoked manufacturing innovation that established internationally competitive firms in a variety of industries. This first tier of the argument focuses on how a conservative coalition used the institutions of a centralized state to create a developmental policy. The primary objective of that policy was the restoration of national wealth and economic power.

Our purpose in this first tier of argument is to establish both the parameters of policy, so we can later consider their impact on market performance, and to show that the policy was the product of a clear political choice. In the next section we want to demonstrate that market dynamics in Japan are not the product of some universal set of economic rules, but rather the result of the structure of nationally specific institutional arrangements that reflect political choices. Our purpose, then, is to establish both the parameters of the policy and that the policy was the product of clear decisions.

To show that market dynamics can only be understood within a specified institutional and political context, this discussion focuses on the promotional and protective policies of the state. We could reach the same conclusion in the Japanese case by focusing on

the labor market. For example, much has been made of the fluidity and flexibility of management and labor arrangements within Japanese companies. It is less often recognized that such arrangements were responses to real political and economic conditions, not predictable consequences of some inherent cultural bent. The Japanese pattern of giant companies offering lifetime employment, albeit to one segment of the workforce, has unquestionably allowed closer working ties between management and shopfloor and great adaptability on the shopfloor. Lifetime employment, however, was not some element of the traditional world carried over to the present, but rather a corporate and political response to the emergence of a radical trade union movement in the 1950s.⁵ More powerfully, the Japanese labor market is segmented, that is, workers are divided institutionally into largely separated parts of the labor market. That institutionalized segmentation provides some workers long term employment guarantees and leaves others to absorb both the shocks of economic cycles and longer term economic evolutions. This combination of rigidities and flexibilities not only produces particular dynamics on the shopfloor, but makes it difficult to mobilize a broadly based labor movement as a political challenge to the direction of development.

-- The Emergence of the Policy:

The Case of Chemicals and Steel --⁶

The postwar pattern of developmental policy was first evident in the 1950s when the government decided to give priority to the heavy and chemical industries as a means to lead Japanese development. In a basic sense the policy was not new. Modern

Japanese politics began with the Meiji restoration that had as its core purpose the preservation through economic development of the Japanese community against the intrusion of the West. The centralized and insulated character of the state bureaucracy that was a creation and descendant of that restoration gave great influence in formulating and shaping policy, not just implementing it, to a caste of senior civil servants.⁷ State administration didn't replace politics. Rather, bureaucrats became an important part of the policy alliance, and the state bureaucracy provided a political stronghold for a developmental coalition.⁸

In a moment we will characterize the overall pattern of policy, but let us examine it here in the initial case of heavy and chemical industries. These industries were protected against imports and foreign direct investment. Imports were controlled by tariffs and the Fund Allocation System. The fund allocation system required importers to ask MITI to allocate foreign currency to import goods and permitted MITI to decide who imported what. Development or promotional measures gave tax privileges in the form of special and accelerated depreciation of investment and priority financing through government owned banks. In the late forties and early fifties, the government sought to create infrastructure for sustained development by investing in energy, including electrical generators as well as mining equipment, supporting road and port construction, developing transportation through investment in shipbuilding and trains, and establishing communications networks. In the mid fifties the government moved beyond basic infrastructureal activities to support a broader range of heavy investment sectors.

The decision to support the heavy and chemical industries grew into a choice to pursue a strategy of creating advantage and then into a conscious challenge to traditional economic theory. In the late 1940's the debate was between a strategy of "developmentalism" or autonomous state directed development and one of "tradeism" or integration into world markets.⁹ The debate in journals and in the government was settled with the creation in May 1949 of the Ministry of International Trade and Industry (MITI) to "establish Japan's participation in the international economic system and in order to let export industries drastically develop."¹⁰ The advocates of both positions were members of the Economic Reconstruction Committee, leading one observer to remark that "MITI selected Tradeism (to solve problems through expansion of world trade) in the Developmentalist way (through government planning)".¹¹

In late 1955 a five year plan for economic independence called for strengthening Japan's industrial structure through developing secondary industries, particularly heavy and chemical industries. As the Japanese took back control of their economy from the occupying forces, basic industries such as steel, coal, energy and transportation required for economic redevelopment were favored. At the same time in the late forties and early fifties, a strategy of developing heavy industry as a means of expanding exports had been emerging. Such a strategy, though, contradicted economic traditional theory, which argued that successful exports required industries in which Japan had a comparative advantage. At the time that meant light industries where little capital was needed and cheap labor could provide advantage in international markets. Yoshida Shigeru,

the Prime Minister, and Ichimada Naoto, the President of the Bank of Japan, believed in this traditional theory. As long as Yoshida controlled the cabinet, the heavy and chemical industrialization strategy was not possible.¹²

The decision to pursue development and trade through heavy industry required planners to confront traditional theory. The decision was not made because of new theory, but rather new theory emerged as part of the debate surrounding an evolving policy. The concrete decision was whether to invest in heavy industry or in sectors of light industry where traditional theory suggested that Japan had an advantage. Shinohara Miyoei argued that a static economic theory cannot assess the different development possibilities of light and heavy industries. For instance, as national income increases the demand for the products of heavy industries will grow more rapidly than those of light industries. Miyoei contended that while dependence on light industries might have been more advantageous and profitable for Japan at the time, it was likely that heavy industry would make a bigger contribution in the future.¹³ MITI used this perspective to develop and justify its industrial policies. When a cabinet report laying out this theory was released in 1965, it became official policy. The report represented MITI's challenge to traditional economic theory and formalized its own strategy for Japan's development.¹⁴

MITI's case was made as follows:

There are some cases when the internal market mechanism does not work completely. International division of labor based on comparative advantages does not necessarily give us an advantageous industrial development in terms of long-term income elasticity of demand.

Industrial Structure Policy, while it removes those market failure, has significance in the sense that develops industries in which increase of productivity can be expected.

In order to heighten the industrial structure, we plan to develop those industries in which we can expect growth. Particularly, autos, large machine tools, industrial machines, large computers, specialty steel, petrochemical industries etc. are still on the way to development. They do not have enough international competitiveness. But because they have high income elasticity of demand and have a big possibility of productivity increase, we can expect them to perform a leading role in heightening the industrial structure. We have to rely on them to get foreign currencies in the process of achieving an advanced country's type of industrial structure. [15]

One observer put it this way. "In short according to the Japanese government's economic plan, the country first tried to reconstruct basic industries such as steel, coal, electricity, and transportation from the late 1940s to the early 1950s. From 1950 to 1955, the government plan shows it was gradually favoring the idea of heavy and chemical industries for the development of the industrial structure. In 1955, the government clearly moved toward heavy and chemical industrialization, but at that time, they lacked a supporting economic theory."¹⁶ The theory was proposed and published in 1965 when Japan had already begun to realize the development of its heavy and chemical industries.

Practice, it seems, preceded theory. We can only speculate on, but not detail, the political fight that preceded the victory on which the new theory rested. In a sense modern Japan has always chosen the image of the economy it wished to have and then pursued it. The Meiji restoration was a revolution undertaken to permit Japan to develop an advanced society and economy. It would appear that Japanese officials in the post-war period sought to recreate the course of development underway before and during the war.

-- The Developmental Years: An Interpretive Sketch
of the Interplay of Government and Market --

There is a debate not so much about what the Japanese government attempted to do, but about whether the stated policy was implemented and whether the policy worked. What does it mean to say that the policy "worked"? Considering whether the government could directly and systematically impose its will on particular companies or on the market misposes the question. Firms in Japan must consider government purposes in their strategies and must still inform and often negotiate with government about the direction of corporate strategy. It is the character of the interaction between government and firm, and state and market, not the domination of one by the other, that is the issue. Market outcomes cannot be understood without evaluating the influence of policy on the dynamics of competition.

During the period of orchestrated development from the mid-1950s to the late 1960s, the Japanese government's primary commitment was to economic growth and the transformation of the economic base from agriculture and light industry to heavy industry. To pursue this goal, the government sought to establish the infrastructure necessary for private firms to expand, develop, and compete. Infrastructure was very broadly defined; it included entire industrial sectors, such as steel and shipping, that reduced the cost of imported materials and were critical to the entire economy. The government assured critical sectors the financial resources they needed to expand competitively, both by providing budgeted funds and by manipulating the financial system to do this. Similarly, it encouraged the

importation and domestic development of basic technologies. In this sense, in the parlance of the trade debate, Japan targeted certain industries. But that metaphor is misleading, and it understates the complex web of arrangements that underlay the competitive drive for success within Japan.

The Japanese government exerted influence on the industrial economy during the boom years, that is, it set the market rules and determined the logic of the incentives firms faced in two principal ways.¹⁷ First, the government was a gatekeeper, controlling external access to the domestic economy; perhaps more accurately, it patrolled the channels that tied the national to the international market. The discretion to decide what to let into Japan permitted the government to break up the packages of technology, capital, and control represented by foreign multinational corporations. MITI was the primary functionary in these gatekeeper activities. As Chalmers Johnson explains:

"Before the capital liberalization of the late 1960s and 1970s, no technology entered the country without MITI's approval; no joint venture was ever agreed to without MITI's scrutiny and frequent alteration of terms; no patent rights were ever bought without MITI's pressuring the seller to lower the royalties or to make other changes advantageous to Japanese industry as a whole; and no program for the importation of foreign technology was ever approved until MITI and its various advisory committees had agreed that the time was right and that industry involved was scheduled for 'nurturing'." [18]

There is little doubt that policy had the effect of reducing the cost of adopting foreign technology. The government, using the Foreign Capital and Foreign Exchange Control Law, could restrain inter-firm competition for the acquisition of foreign technology by narrowing the number of firms eligible for foreign capital. It is reported that in the case of the steel industry, the first industry

promoted, the royalty for the oxygen-furnace process technology for steel (which was originally purchased from Austria) was one cent per ton of steel, while the same technology was bought at the price of 35 cents per ton in the United States where severe inter-firm competition occurred.¹⁹

The closed market gave Japanese firms a protected base of demand that facilitated the rapid expansion of production and innovation in manufacturing. This served to negate the product or production advantages foreign firms would have used to enter the Japanese market in a range of products including automobiles. The Japanese automobile market was quite closed to foreign firms. Indeed, a reciprocal agreement limited Fiat, a firm quite capable of producing small cars that were in demand in Japan, to selling 3,000 cars a year. By the mid-seventies, such restrictions on imports did not matter. By that time, Japanese firms had achieved a competitive position. But the restrictions played a role in creating advantage during the earlier period.

Second, agencies of the Japanese government --notably MITI-- sought to influence the development of the domestic economy. Seen from the perspective of the firm, government policy helped provide cash for investment, tax breaks to sustain liquidity, research and development support, and aid to promote exports. We shall examine these policies in a number of cases as we proceed. These public policies --the web of policies rather than any individual element changed the options of companies. Without inexpensive external debt finance, the funds to expand production rapidly would not have been available. With a protected market the availability of inexpensive

capital and imported technology was bound to attract entrants to favored sectors. Protection and promotion in Japan served to produce real domestic competition.

MITI was not so much a director of this competition as a marketplace player, with its own purposes and its own means of intervening in the market to achieve them. The balance of initiative between business and government varied across sectors. In some cases policy reflected objectives conceived by government and pursued with industry, in other cases it appears policy directions emerged from industry and were supported by government. While the details of policy varied across industries, the combination of protection from imports and foreign investment and promotion through investment and research and development was essential.

"The theory underlying industrial structure policy was to place underdeveloped domestic industries with little competitive power under the government's active interference and to build up large scale production system, while limiting entry into the domestic market of foreign enterprises with already established mass production systems and restricting the competition of foreign manufacturers in the domestic market." [20]

The constant purpose of policy was to shape comparative advantage, to use sectoral policy to restructure the entire economy. Policies favored sectors considered to be critical to Japan's long-run development. In the years after the war this meant favoring capital intensive industries rather than the labor intensive industries that might seem appropriate to an economy with a scarcity of raw materials and capital. Priority industries were those industries that: 1) were likely to expand with increases in national income; 2) offered the possibilities of economies of scale from

concentrated investment; 3) would drag the rest of the economy along in their wake; and 4) could become export industries.²¹

-- A Pattern of Controlled Competition --

The Japanese government's industrial strategy assumed that the market pressures of domestic competition would serve as an instrument of policy. It is not simply that the government made use of competitive forces, but rather that it often induced the very competition it sought to direct. There was (in the phrase used by Professor Murakami of Tokyo University) intense but controlled competition.²² Domestic competition substituted for the pressures of the international market to promote development and efficiency. Promotional policy attracted market entrants, and the stampede for entry and the resulting battle for market share were then termed by MITI as excessive competition which had to be controlled.²³ Under these circumstances, the government and private sector worked together to avoid "disruptive" or "excessive" competition. There were a variety of mechanisms to control competition that included expansion plans agreed to jointly by government and industry, debt financing of rapid expansion that made the bankruptcy of major firms a threat to the entire economy and hence unthinkable, and somewhat later the oft-cited recession cartels. Equally important, joint research and development programs initially funded by MITI for the development of generic technologies assured wider diffusion of a technology base than might have occurred from purely private programs, whether government subsidized or not. Similarly technical standard setting served to channel competition into applications and

manufacturing. Although corporate arrangements to manage the market sometimes broke down, this should not be taken as evidence that they did not operate or do not matter. In semiconductors today, as in steel a generation ago, such arrangements have been central to the international success of Japanese producers.

Finally, it is important to note that the complex of policies that encouraged rapid entry and a scramble for market share rather than short-term profits, also encouraged surges of exports as aggressive firms competing for domestic market share reached the international market together. These surges, in fact, began to lead to criticisms of Japanese economic policy by Japan's major trading partners.²⁴

-- The Basis of the Developmental System:

Politics and Market Structure --

The developmental system and the interaction of market and state in Japan rest on a very particular set of institutional arrangements and bargains in politics and business. Of particular importance are the political priority accorded development, the political capacity to pursue that priority, and the market arrangements that make controlled competition or cooperation amidst competition possible. The brief remarks that follow cannot fully characterize national policy and the business system. The intent is only to suggest how a developmental policy could be built and to identify the mechanisms that permitted it to be implemented and to produce an outcome of controlled competition. While necessarily brief, our approach is

systematic. It builds on two key notions -- governing coalitions²⁵ and the institutional structure of the economy.²⁶

Structural arguments are commonplace in politics and the subfields of economics known as industrial organization and comparative systems. Here we are concerned with how institutional arrangements and market structures, the institutional structure of a nation's political economy, act as constraints on politics and policy. The structural approach holds that a structure creates an enduring set of penalties and rewards that mold actions independent of the motivations or purposes of the actors.²⁷

According to the structural approach, there will be regularity in the form of policy, in how policy is formulated and implemented, whatever its objectives, because of institutional constraints. Institutional structure defines the range of policy instruments realistically available and the processes by which they are used.²⁸

Thus, for example, in the case of France the Left and Right put the instruments of the centralized state to quite different ends, but there are common elements in their approaches to policy simply because they faced the same institutional constraints and options. A particular government is apt to find some problems more intractable than others. In France, again, very similar policies succeeded in some French industries, but not in others. Although the policies looked very much alike, the outcomes were different because effective solutions required to the problem at hand depended on the institutional characteristics of the industry in question. Structural arguments suggest that particular institutional structures that create or circumscribe capacities for state action will

establish patterns of distinctive national competence and weakness. If the tasks that face a nation require capacities that exceed or are different from the capacities that the structure creates, then new capacities are required. When new tasks require new capacities, then pressure to alter or develop the structure can be powerful.

The second contention of a structural position is that institutional structure --both of politics and the market-- shapes political processes. On the one hand, structure creates channels through which influence can be developed and exercised and in so doing makes some coalitions easier and some policies simpler. On the other, new strategies or new problems may require changes in the institutional structure. Institutional reforms involve much more than redesigning organizations to achieve greater effectiveness. Since the arrangements between and within organizations establish position of privilege, reform means dislodging incumbents from their strongholds. When these incumbents represent specific groups in the society, institutional reforms entail political change in the social balance of power. If new tasks create a need for new state or social capacities, there can be real challenges to existing social and political structures. Surviving the challenge may require substantial reform; failure to achieve reform may bring decline or collapse.

Structure will not simply set down regularities in policy but will create predictable kinds of political battles. The how of policy and politics will affect who will be allies and enemies as well as the tactics used in their fights. The institutional structure of the economy does not create politics, but by delimiting

some of the possible issues and alliances, it can establish channels through which political fights are fought. Simply stated, what is attempted and achieved is affected by how it must be done.

At the same time, politicians and political groups reflect the economic and social composition of the economy. Those who govern devise the policies and purposes of government and their choices reflect their origins. The governing coalition is a notion of the social composition of the ruling groups and how they are organized. Consequently, we can imagine that the economic objectives espoused by the ruling groups reflect the economic interests of their supporters and the political processes by which they take power. From this perspective, to make sense of the objectives and policies pursued in Japan we must consider both its institutional structure and its governing coalition.²⁹

The policy base in Japan has two crucial components -- a conservative coalition that underpins and gives movement to the whole, and an administrative apparatus and financial system that permits implementation of the coalitions objectives. The political underpinning of the system has been a conservative coalition of organized agriculture and business interests that has insulated the bureaucracy from radical political shifts. The Liberal Democratic Party (LDP), the embodiment of this coalition, was initially based on rural and small town votes and big business finance. It has been in power for more than three decades.³⁰ Power shifts between factions within the party, but the party itself has been the government. The factions themselves have been the focus of political negotiation within the party and of electoral mobilization.³¹ The faction system

has managed popular participation while limiting the scope of mass mobilization.

As significant as the strength and cohesion of the governing coalition has been the fragmentation and weakness of the opposition. While there has been a substantial socialist party, the left has not posed a challenge as an alternative governing party for years. Nor, despite the radical public sector trade unions and the annual orchestrated spring wage offensives, have the unions been the basis of a challenge to corporate authority.³²

The political trick has been to create a mass political base for a developmental policy conceived by an elite, but to insulate that elite and its policy from the electoral mass. The conservative coalition has not just sponsored the market process but has assured it would continue in the face of potential political disturbances produced by market dislocation. Economic development is not a bloodless and smooth process. It involves real disruptions and dislocations. Peasants are moved off the land; a working class emerges; the relative position of individuals, social groups, and communities in the society and economy changes sharply.³³ The notion that national income and wealth is expanding is never reassuring to those who are being displaced. Unless the political problem of allocating the gains and costs of change is resolved, the resulting conflicts and struggles can paralyze the market.³⁴

The LDP helps provide a Japanese solution to this problem. Despite the fundamental social transformation that saw a rural society finally and definitively transformed into an industrial one,

the conservatives and more precisely the Liberal Democratic Party has held on to power.

A contrast with France is instructive. In France, where a very similar process was at work, a conservative coalition sponsored growth only to be overturned and then altered by the results of its handiwork. During the period of rapid growth, the modernizing party in France, fundamentally the Gaullist party in its many names, rested its appeal on personal and institutionalized charisma, the appeal of the great man and then the party that claimed his mantle. Later Giscard made an appeal on the basis of technical skills in managing the economy. The conservatives also campaigned against the communist menace. When with the emergence of a coherent anti-soviet Socialist Party the Communists no longer seemed a foreign menace, and when the economy turned down with no politically meaningful explanation provided by the ruling conservatives and no hope of relief, the French left found an opening to win. The ties of the French conservatives to the populace could not withstand the social transformation of France.³⁵

In Japan, the LDP with its local roots and faction system has adapted and adjusted without allowing political interference in the core elements of its developmental policy. While business has provided massive support for the LDP, for the most part this has bought protection against a basic transformation of policy. There has been extensive corruption, that is, the use of patronage and payoffs, but it has remained situated in secondary ministries. Construction, as in so many societies has been entangled with local

and national politics.³⁶ Appointments in the postal system and educational ministry have also been important elements of patronage.

The administrative apparatus is structured in a fashion that permits a group of elite bureaucrats -- most prominently those at MITI and the Ministry of Finance to formulate conscious strategy for industry and provides them with instruments to implement it.³⁷ The elite bureaucrats themselves form something best thought of as a caste, recruited from the most prestigious national university schools and rising within the system together. The senior administrative positions beginning essentially with the deputy minister are assigned to members of the senior administrative elite, not filled with political appointments. In the United States, in contrast, political appointments reach five or six layers down into the administrative system. The Japanese administration is centralized, which makes the national bureaucracy the crucial locus of government policy.

The executive branch has tended to dominate the processes of policy making and legislation. Legislation is very much a creation of the bureaucracy, that is legislation for the most part emerges from bureaucratic rather than legislative initiatives. There has been only limited legislative scrutiny of most administration decisions. The administration has extensive discretion in determining and applying rules, which gives it extensive power in bargaining with the private sector. The result has been a system that has colorfully been described by Johnson as one in which "Politicians reign and bureaucrats rule".

The bureaucracy is by no means coherent, that is, there are real and intense rivalries among ministries, and different bureaus within

ministries quarrel as well. The location of a policy decision -- which ministry it falls in -- powerfully influences how it is made. Battles over the boundaries of policy are normal. An instance of this fight between political and developmental ministries is told in the next chapter on telecommunications. Overall, however, despite such rivalries, bureaucracies and bureaucrats are significant and somewhat autonomous players in the economy.

In a sense it could not be otherwise in Japan. The Meiji restoration displaced the Shogun with a group composed of the traditional equivalents of modern bureaucrats. A small elite ruled in the name of the emperor without a constitution or roots in mass politics. After the Second World War, when the pre-war ruling cliques and the military were discredited, the economic bureaucracy emerged as the central element of policy-making. The capacity of this bureaucracy to implement policy directions in economic affairs rests then in substantial ways on its influence in developing legislation and its administrative discretion in implementing it. It also rests on a web of consultative groups or councils organized by each ministry. These groups are a source of advice, legitimation and assistance in conducting policy and implementing policy. In this way interest groups are themselves shaped by state action and tied to the bureaucracy even more than to the legislature.

Equally important, the structure of the financial system gives the bureaucracy instruments to intervene selectively as a player in the industrial economy or to assemble policy compacts which join public and private purposes. As Ueno has argued, at least through the early 1970s the financial system was a crucial instrument in the

government's repertoire of domestic policies.³⁸ It permitted the government to direct not just budget funds but the flow of savings and investment in the economy.

As Ueno summarized the situation:

Broadly speaking, the total supply of funds in Japan was controlled by the Bank of Japan, the level and structure of interest rates were artificially regulated by the Ministry of Finance, and private funds were allocated, under the guidance of public financial institutions, by city banks which competed for market shares. In this process, the Bank of Japan followed the guidelines of the Economic Planning Agency and the MITI and determined the total amount of funds so as to satisfy the demands to growth industries. At the same time, the Ministry of Finance maintained the low interest policy inasmuch as the policy did not lead to large deficits in the balance of payments or to sharp price rises.[39]

Zysman has summarized the importance of the financial instrument in the following way:

The credit-based financial system served the government as a powerful instrument of policy. The political and policy strategies of the Japanese government would have been difficult to accomplish within the constraints of a capital market-based financial system with freely moving prices and an elaborate securities market. The financial instrument in Japan served several purposes. Most generally, it helped force the household sector to bear the costs of expansion in the form of artificially low interest rates. At the same time, the system socialized those costs by diffusing or absorbing the risks of investment and corporate failure. It also reduced the price of expanding and stockpiling goods in anticipation of market development, which has been a constant Japanese market tactic. Access to credit was selectively manipulated to provide preference to favored sectors and to push the economy slowly toward capital-intensive and knowledge-intensive production.[40]

-- The Institutional Structure of the Japanese Economy:

The Organization of Industry --

The market dynamics so critical to the success of the developmental strategy turned on market structure not just government policy. Of course, we hasten to repeat, market structure itself

embodies and expresses past policies. Our task here is limited. We want to identify elements of the industrial structure that give particular character to the logic of market dynamics in Japan and make plausible our account of Japanese development. We are interested in both "controlled competition" and the mix of flexibility and strength in industrial sectors.

Japan is characterized at once by very intense domestic competition and by a range of mechanisms for cooperation or collusion. Whether it is joint planning of expansion in capital-intensive industries to avoid excess capacity and to assure the introduction of plants of sufficient size to capture scale economies, or joint research on generic technologies, or reallocation of domestic market share in the aluminum industry to firms that move production off-shore, or efforts to allocate domestic market to foreign firms -- the evidence is overwhelming that competition is bounded and orchestrated. The deals may or may not be stable, that is, the market divisions may or may not be fixed. However, market outcomes are certainly different because such mechanisms for collaboration, collusion, and bargains exist.

Elaborating how this system works requires specifying the rules of controlled competition, that is circumstances or terms of competition and the circumstances or terms of collaboration. In steel in the fifties competition was structured by setting the order and scale of new plants. In numerically controlled machine tools the emergence of a dominant supplier of controllers channeled competition into applications.

Bounded competition is certainly not unique to Japan. American automobile companies in the 1950's and 1960's eschewed radical product change or fundamental innovation in production. They choose instead to compete on marketing and superficial product change. European steel makers have historically arranged matters in both national and regional cartels, the cartels arranged privately, with collaboration of governments, and now with the collaboration of the EEC. The National Football League is in fact a formal and structured system of bounded competition. Teams collaborate to sustain the league and its rules, and compete to gain position within it.

What is distinctive in the Japanese case are the mechanisms for controlling competition through collaboration. This is not so much because Japan is an economy of giant firms, although levels of concentration in the economy as a whole and in specific markets are as high as or higher than in the United States. Rather, a number of mechanisms draw large firms together in common institutions. The trading companies, an early link between the insulated domestic economy and its external sources of supply, represent one such mechanism.⁴¹ A second mechanism, the Zaibatsu groupings of companies, were dissolved in the American occupation. However, keiretsu, groupings of firms around large banks, based on the zaibatsu tie firms together in a variety of ways. There are several forms of keiretsu, ranging from groups with close inter-company ties to loose, basically financial arrangements. While there is a debate on the precise form or degree of operating cohesion in these groups, the fact is that a majority of company stock in Japan is held by other companies or banks.⁴² Third, the world of small firms is not

the anarchic site of perfect competition either, because many of the small firms are linked as suppliers to larger companies. Small firms are not inevitably relegated to subordinate supplier status; some independent small firms have grown to compete directly with the giants. But the well known and much publicized examples, Sony and Honda, are rather exceptional.⁴³ Lastly, while cartels are nominally illegal, an enormous number are in fact exempt from the general prohibition. These several forms of inter-company linkage provide the organizational infrastructure for controlled competition.

There are a range of government mechanisms to facilitate coordination among firms; that provide what Dan Okimoto calls "handles". As he notes:

"In Japan, MITI's capacity to administer industrial policy is greatly facilitated by the vast and amorphous network of formal and informal intermediate organizations that lie in what I call the "intermediate zone" between state and private enterprise." [44]

Some of these handles are evident. Much has been made of MITI's structure councils where private business leaders, government officials, academics, and even press leaders meet to formulate policy directions. Equal attention has been focused on the MITI research consortia intended to develop next generation technologies. Projects organized by Nippon Telephone and Telegraph, now a nominally independent but state owned company, translates into purchases from "family" firms which permits NTT to influence company strategies. A range of cartels for a variety of purposes have been and still are normal practice. It is not a matter of government dictating outcomes, as we have been emphasizing, but its role in balancing and facilitating. Again, Okimoto argues this well:

The state is thus a linchpin. Its power is not based on the concentration of legal authority sufficient to overwhelm recalcitrant groups. Rather it is derived from the state's strategic role as the indispensable linchpin that holds the functioning units of society together and permits it to act in ways that advance collective interests. Perhaps it can be called a "network" or "relational" state in the sense that its power is largely derived from the nature of its relationship as central coordinator of strong constituent groups in society.[45]

Such cooperative arrangements do not determine the behavior of markets. The arrangements are not always stable and firms clearly violate them. Indeed, the Japanese government's defense against American legal charges that television firms conspired to penetrate the American market was that the government had ordered cooperation but the competitive instincts of Japanese firms had made cooperation impossible.⁴⁶ Struggles have even occurred within the government. When MITI excluded OKI from next generation technology semiconductor development, NTT helped it rebuild its technology position.⁴⁷ Despite such exceptions, collaborative agreements among firms exist and matter. The market functions differently because they are present; they create the conditions for "controlled competition" as an instrument of developmental policy.

The second major feature of the economy important to our analysis is that Japanese industry combines in an innovative manner the strengths of large firms which are able to mobilize substantial resources in pursuit of long-term objectives and the flexibility and mobility of small firms. The advantages of large Japanese firms have been the subject of much discussion, but in many countries, not least the United States, many giant corporations have been lumbering giants. Less has been said about the flexibility that has made large Japanese firms agile, not lumbering, giants.

Small firms play a decisive role in this. Despite American rhetoric about entrepreneurship and our fascination with large integrated Japanese firms, small manufacturing companies have a much larger place in the Japanese economy than in the American one. Manufacturing firms with under 500 employees represent a much larger percentage of both employment and output in Japan than in the United States.⁴⁸ The relative importance of very small firms, those with less than fifty employees, is even greater in Japan.⁴⁹ Moreover, the importance of small firms has grown in many industries during the decade of the seventies.⁵⁰ Small firms have survived in Japan because of its late start in development and because of the political necessity of preserving what were once not only small but also traditional firms. Many such firms have been protected by law and have been sources of inefficiency. But it also appears that many have been a part of the particular pattern of Japanese dynamism.

Small firms help provide flexibility in two ways. First, they have permitted large Japanese firms to establish production systems that captured economies of scale without relinquishing flexibility. Small firms that are suppliers and contractors to larger firms play a vital role in this. In the American system many of the tasks these small firms play are integrated in the parent company. In Japan, subcontracting links component suppliers to the parent assembler by market ties rather than by hierarchy inside a firm. The small firm must scramble to adjust to changes in the market demands of the large parent firm. Subcontracting ties fluctuate radically as new technologies are introduced. This represents an important mechanism

for accelerated adjustment in the face of changing market or technological conditions.⁵¹

We must not be lost in the Anglo-American dichotomy between market and administration. The Japanese system combines both along lines different from those with which we are familiar. Inside the company we find market ties among nominally independent firms to permit coordination but maintain market discipline where in the United States firms we often find administrative control linking similar activities. By contrast, we find agreement and the mechanisms of collaboration in the midst of market competition.⁵²

Second, many Japanese companies begin as spinoffs from larger firms. Elsewhere they might be structured as divisions or tightly controlled subsidiaries. In Japan firms such as Fujitsu and Fanuc are organized as quite independent operations.

There is substantial variation across sectors, however, in the types of relations linking small and large firms. In the textile/apparel complex Nakamura shows us that small firms transformed materials provided by large producers and sold by large distributors into final products.⁵³ In the automobile industry the pattern has been a more vertical one with tiers of contractors supplying final assemblers. Still a third, and more complex pattern of relations appears to exist between large and small firms in the consumer electronics industry.

THE SECOND TIER: THE LOGIC OF MARKET DYNAMICS
WHICH GENERATED INVESTMENT AND PRODUCTION INNOVATION

Although government policies were critical, the direct engine behind growth was domestic competition. Structured competition in a rapidly growing domestic market, closed to outsiders, generated the product and production strengths that the Japanese have taken into world markets. Elements of Japanese culture and of the Japanese business structure, may have facilitated these market innovations, but the driving force was marketplace incentives. Many supposedly "Japanese" characteristics --including the pursuit of market share and the tactics of internal organization-- follow logically from the nature of the market situation, even though they have roots in policy.

The second tier of our argument focuses on how the policy of promotion and protection in an industry structure composed at once of large groups and layers of small firms generated an intense investment driven competition for market share. Competing for domestic market share while borrowing technology drove a pattern of continuous production innovation that now characterizes Japanese companies and has helped them create real enduring advantage on world markets. This second tier of our argument is itself developed in two parts. The first part analyzes the market dynamics that drove corporate strategy and the second analyzes how corporate strategy --

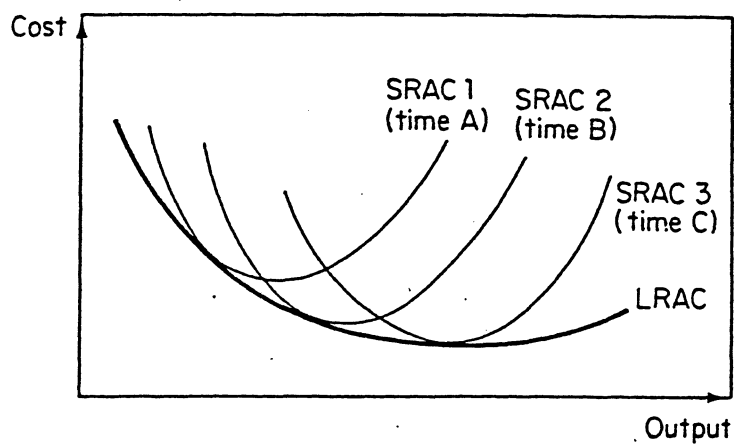
particularly production strategy -- drove the organization of the shop floor.

-- Market Dynamics and Corporate Strategy --54

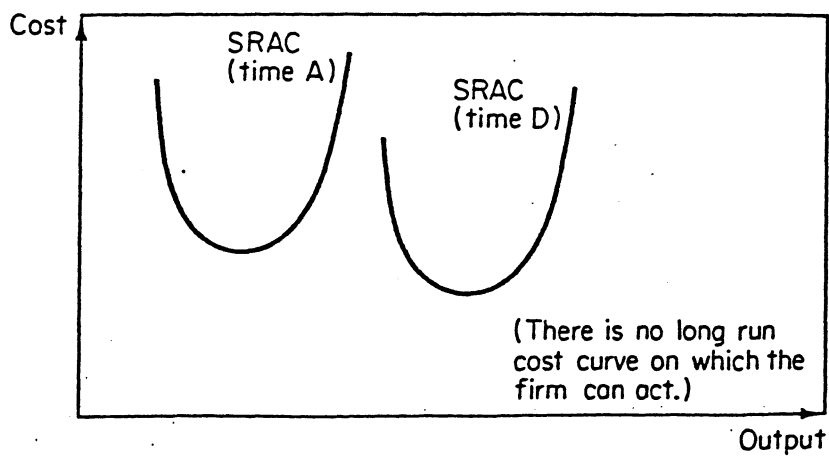
Market dynamics in Japan drove firms to pursue market share aggressively as a means of maximizing profits. As all firms sought to maximize market share excess capacity and "excessive competition" resulted. This in turn led to efforts to regulate or bound competition. Equally important, constant efforts to import and develop foreign technologies created a basis for government organized consortia for technology development, which also structured and bounded competition. The argument we build rests on three premises; that the Japanese market was relatively closed to the implantation of foreign firms; that financial resources could be channeled to expanding sectors, and that foreign technology could be readily borrowed and implemented.

For the Japanese firm the primacy of the pursuit of market share is a product of the logic of market conditions in post-war Japan not the particularities of Japanese culture. Intense domestic competition in a protected and rapidly growing internal market among firms that had access to international product and production technologies had predictable results. As long as the Japanese were aggressive and systematic technology borrowers in a rapidly expanding domestic market, they faced a fundamentally different economic situation than that of foreign companies. The differences in the situation produced the emphasis on market share and production innovation so often remarked on. Murakami and Yamamura have

developed an intriguing analysis of the consequences, more precisely the advantages, of Japanese efforts to overcome technological backwardness.⁵⁵ Put formally, Japanese firms faced long-run declining cost curves, rather than the usual U-shaped concave cost curves.⁵⁶ Assuming a concave cost curve, a firm will eventually face rising production costs as volume rises. To avoid rising costs it must innovate and jump to another production cost curve. That new production cost curve represents a new technology. (See Figure 1.) A firm will make the jump if it can anticipate that an increase in demand will justify the investment, if rivals are making or are likely to make the jump imposing competitive pressure to do so, and if the cost of innovation is low and its success predictability high.⁵⁷



(a)



(b)

FIGURE 1

Production Innovation and the Evolution of Costs

(a) Continuous Production Innovation and Corporate Choice

(b) Discontinuous Production Innovation

In the Japanese case, firms faced rapidly expanding domestic demand and a stream of replacement technologies available abroad. Under these circumstances the jump to new technologies was particularly attractive. Also under these circumstances, it is easy to demonstrate that firms following a market-share-maximization (MSM) strategy, as the Japanese firms were doing, would behave in the same manner as firms pursuing a profit-maximization strategy. Murakami and Yamamura explain the situation the following way:

... when firms are operating on their decreasing long-run average cost curve (i.e., decreasing long-run AC, thus also decreasing long-run minimum average cost), we can also show that aggregate industry supply consists of long-run MAC curves of individual firms pursuing the MSM strategy. However, a crucial fact to be noted is that an equilibrium reached can be an unstable one.

Furthermore, it is not difficult to see that if this is the case, both the firms following an MSM strategy and those pursuing a profit maximization strategy will behave in the same manner. This is so simply because, when average cost is falling and the market price of output is given, an individual firm can increase its profit by increasing output. A result is that all firms are anxious to supply output that is greater than the quantity they are now producing, provided that an increase in output can be obtained anywhere above the AC curve. This is to say, when AC curves are "added" up, we obtain the amount that all the firms in the industry wish to produce collectively. This simply means that when faced with decreasing long-run average cost, both the profit-maximizer and the MSM firms behave in virtually identical fashion, and there is no need to distinguish the difference in their respective motivations. In both cases, the equilibrium reached will be unstable, as expected of any decreasing cost industries. The point we wish to emphasize here is that profit-maximizing firm behavior is indistinguishable from MSM behavior. (*Italics in original.*) [58]

Under the cost conditions described here, additional market share pushes a firm down its cost curve setting off a continuing cycle. As the firm increases volume, it takes additional market share which lowers its costs, making it able to increase sales, thus

starting the cycle over. In sum, firms are motivated to move down their cost curves faster than their competitors or to force a sharper reduction in their costs for each increment in production volume.

We can predict much of the behavior of Japanese firms with this analysis. We do not need to resort to arguments about the art of Japanese management or the character of the Japanese work force. In the United States, a similar analysis is often applied to high technology industries where new products are being introduced. Because of well documented learning curve effects in such industries, each doubling of total output will generate a predictable decline in average production cost. As new products are introduced in low volume their costs are high, but as output increases, production costs drop. Therefore firms must move to establish market position and defend market share by steadily lowering costs. When applied to industries such as semiconductors, this analysis suggests that firms will be encouraged to price below existing costs to capture market share. The resulting volumes will lower costs below existing prices. Indeed, management practice books often identify some American firms operating or organized in the Japanese style, and these firms are generally ones in high-technology sectors where the learning curve logic that generates long-run declining costs is at work.

What is distinctive in the Japanese case is the ability to apply the logic to traditional industries, such as automobiles. Such sectors, which in the United States were mature, were in their infancy in Japan. Given the same market conditions, producers of many nations would likely have responded in similar ways. Automobile production in Japan jumped from 160,000 cars in 1960 to some

10,000,000 by the end of the 1970s. Each new assembly line was an experiment station for production, and Japanese companies could innovate and move down production learning curves. In essence, the Japanese imported the best available production technology and then improved on it. The marginal improvements accumulated into a fundamental manufacturing innovation. Rapidly expanding markets meant that firms faced powerful incentives to learn how to improve on imported practices.

What are the consequences for the industry if all firms in an industry face declining cost curves and consequently seek to maximize market share? The firm with the largest market share is in the best position to drive costs down and continue in a dominant position. Consequently firms are induced to establish capacity to capture the market share they require to be successful. However, if all firms build production capacity to fit the long-term strategic objective of holding dominant market share, then excess capacity will inevitably result. The more aggressively firms believe their competitors will pursue market share by building capacity in anticipation of demand, the more aggressively they must respond. The only alternative is to withdraw from the game. The outcome of such aggressive competition will be periodic bouts of excess capacity.

How, then, manage the excess capacity? One mechanism is to export the excess output. Yamamura contends that in the 1970s there were surges of exports from Japan, a downpouring of exports, as the domestic Japanese market was saturated.⁵⁹ This sale of excess product encouraged firms to sell at marginal cost, leading to very low prices in foreign markets. As a result, Japanese firms were

frequently accused of dumping. These trends have continued to the present. In some sectors, such as semiconductors and for some products such as random access memory chips, Japanese firms have begun to define the market to include US as well as Japanese demand. The result is that each product generation now sees sudden saturation of the American market. Consequently, prices in both the Japanese and American market are driven down almost as each product introduction occurs, leading to an intensification of charges of dumping.

A second mechanism of managing excess capacity has been cartels or production controls negotiated among firms often with the assistance of the government. Here the mechanisms of "controlled competition" discussed above come into play. As Yamamura notes, these agreements are often not very stable, because the imperatives of pushing down the cost curve further and faster will induce firms to break agreements.⁶⁰ Nonetheless these arrangements have often served to bound or regulate the consequences of excess capacity.

-- Corporate Strategy and Production Organization --

With large protected domestic markets and access to borrowed technology, Japanese firms were encouraged to grow rapidly, to pursue market share, and to exploit increasing returns. The corporate practices fashioned in the era of rapid growth significantly affected the tactics of production organization in the factory. The key to organization became flexibility. Those Japanese firms that could organize themselves flexibly to capture the gains of introducing successive waves of borrowed technology had an advantage.⁶¹ The managerial and organizational styles developed during the earlier

years of technology borrowing continued to be successful even after Japanese firms began their own independent production innovation. The history of Honda Motors, for example, shows this story clearly. Honda borrowed and improved upon technology after technology as it moved from a marginal position in the motorcycle industry to an established player in the motorcycle and automobile industries.⁶²

Competition among Japanese firms turned in no small part on manufacturing innovation and the introduction of new product. Consequently, firms were organized to sustain constant evolution in their production processes to improve productivity and sustain the flow of new product. They evolved a practice that "can be described as dynamic flexibility...concerned with designing production lines in a way that they can quickly evolve in response to changes in either the product or production technology...the central preoccupation is to get ideas into action quickly".⁶³

The commitment to flexibility in Japanese firms is reflected in the structure of the market for computer controlled manufacturing equipment. In Japan many firms develop their own production equipment internally. "Almost every large Japanese auto company has a large machine tool operation in which 200 to 400 people do nothing but create new tools, which are quickly introduced into the production process."⁶⁴ When successful, these machines are then sold on the market. As a consequence, the Japanese machine tool market is highly fragmented, shared among many producers who develop equipment for their own internal purposes and then sell it on the open market. In the United States, where less production equipment development occurs internally, the market for programmable machine tools is

highly concentrated. In contrast to the United States where production innovation tends to occur in discontinuous jumps from one prototype to another, in Japan production innovation tends to be more continuous and more iterative. This finding is consistent with the incentives for flexibility which our analysis suggests.

The process of absorbing foreign technologies while aggressively pursuing market share produced substantial production innovation. Something very real did happen on the shopfloor. Sawyer summarizes it well.

...the Just in Time (JIT) system is a learning system which generates economies by making fabrication and assembly more closely approximate a continuous flow line, by reducing the amounts of machinery, materials or labor power which are at any time inactive or not contributing to the production of saleable output. ...Economies do not follow simply from major technological developments, though that is likely to occur too, but from a different way of organizing the labor process coupled with piecemeal changes to the machinery.[65]

The revolution on the Japanese shopfloor is at the heart of continued rapid increases in industrial productivity.

This system did not emerge from the mists of Japanese history nor was it adopted full blown. It was a logical extension of corporate responses to the market dynamics of Japanese economic growth and the emergence of internationally competitive firms. As with the American system, which became known as Fordist, the production revolution is thought to have begun in the automobile sector with Toyota. The first phase in the postwar development of Japan was based on labor-intensive industry. Low-cost labor gave Japanese firms advantage in world markets in sectors such as textiles.

In the second phase heavy investment in equipment allowed Japan to enter capital intensive industries such as steel and shipbuilding. New world scale facilities based on advanced technologies created economies of scale. Labor productivity jumped giving the Japanese higher output per manhour and increasing cost advantage over their American competitors in these sectors. Indeed, the disadvantages of a lack of raw materials and a steel industry destroyed by war were turned into substantial advantages.

The third phase of development in the late 1960s and 1970s could be described as one of focused manufacturing. Although Japanese groups are known for their size and financial muscle and although some capital intensive industries have world scale facilities, many Japanese firms in these years were smaller than their foreign competitors. When attempting to compete with much larger European and American companies, the Japanese found they could not efficiently produce as wide a range of products. This disadvantage was turned into a virtue. The Japanese focused 'all their available resources on those portions of the product line where market demand was the greatest and access to the customers was the easiest'.⁶⁶ This focus created substantial cost advantages. It also is thought to have begun the process of shopfloor reorganization that culminated in the full just-in-time system. Producing a wide variety of products adds enormous complexity to the production process. That complexity generates substantial overhead costs to manage the physical flow of materials and to maintain control of the process. Having first reduced cost by limiting complexity, the Japanese then learned to manage complexity more effectively, with the result that they could

increase product variety and the rate of product introduction while continuing to reduce overheads and increase labor productivity.

Product variety means complexity in production, which adds costs in two important ways: the time it takes to shift from one task to another is one cost while handling and storing the multitude of parts required to make a diversity of products is a second.

Innovative Japanese producers were determined to reduce changeover times. They did so by designing machines and locating them to accomplish this.

In the 1950s the production engineers at Toyota concentrated on significantly reducing changeover times and run lengths in Toyota's factories. Toyota set one minute as a goal for the changeover of a machine from one part to any other part the machine was intended to produce. For machining operations, changeover times were reduced by investing in extra tooling and related equipment rather than in inventories. Extra machine components were purchased so that tools could be left set up to make specific parts. Jigs were fabricated so that the tools could be placed in or removed from machines quickly. The extra tools and jigs were moved...to locations beside the machines...[67]

The success was staggering. James Abbeglen and George Stalk report drops in turnaround times from eight hours to 1 minute in some cases.⁶⁸

Machines were arranged so that workers could move between them. Because many machines or a variety of tools for a specific machine would be employed at any work station, the machine tools were made lighter and less expensive. Consciously, scale economies were sacrificed for the economies of flexibility. As we well know the Japanese did not raise costs to gain flexibility, they simply went about lowering costs in a different way than American producers.

A reduction in turnaround time is the first step in an interconnected set of steps, each producing pressure to adopt the

others. It permits the most efficient production runs to be reduced in length. That is, it becomes efficient to produce any given component in smaller quantities because the machines can immediately be put to use making something else. However, reducing production runs puts pressure on material handling. The right materials must arrive at the right spot exactly at the right moment. Otherwise, the advantages of small batch production, manufacturing in small quantities, are lost because the machines sit idle. Production lines that permitted a simpler flow of parts from one step to the next without need for intermediate storage were created. "Departments based on manufacturing technologies were dismantled and their machines were moved to newly created product departments."⁶⁹ Assembly and fabrication were tied together. This permitted the entire production process -- the mechanisms by which flows through the factory are regulated and in which production schedules are set -- to be controlled differently than in western factories. The elaborate Kanban or just in time system thought to have begun with Toyota was the result.

The advantages of the full blown system are substantial and run from the ability to produce a greater variety of products to the ability to introduce new products more quickly without cost disadvantages. Having begun to reform the production system to gain cost advantage by focused product strategies that limited variety, many Japanese firms ended up by being able to create even greater variety at ever lower costs. The result was nothing short of a production revolution.

-- Conclusions --

We want to emphasize four things about the Japanese experience. First, the system is based on concrete choices about how to organize production. The structure of the labor market and labor management relations are crucial elements in shopfloor decisions and organization. These distinctive features rest more on the particular post-war politics of Japan than on Japanese culture.⁷⁰ Indeed, woven in the pattern of increased worker responsibility is diminished protection for many workers and what some consider an outright increase in the pace of work.⁷¹

Second, much of the production innovation has rested on the reorganization of skilled workers, not on heavy capital investment or on technological innovation. Indeed, the reorganization of skilled workers has created the possibility for technological development.

Third, the system has not resulted in a pattern of extended flexibility in all directions. For example, there is evidence that the number of basic product types in the Japanese auto industry -- measured by chassis and motor sizes -- is greater than in the United States.⁷² This makes sense since there are more firms. There is also evidence that the Japanese have more flexible production lines, producing several types of cars or cars and light trucks on the same line. This may have been needed to compensate for the lost economies of scale from market fragmentation. However, Japanese producers are -- by other evidence -- able to tolerate fewer changes in design than American producers. As anyone who has bought a Japanese car knows, they come in tightly defined packages of options which clearly reduce the number of model types on the assembly line. Others suggest that

the elaborate network of suppliers and a stratified workforce tightly tuned to just in time delivery are less able to absorb radical fluctuations in demand than the American system.⁷³ According to this view, the inability to withstand such fluctuations translates into a downpouring of exports and radical price-cutting when domestic demand is insufficient. Fourth, the presence of an exceptionally large and innovative small business sector has facilitated the dynamic flexibility that characterize Japanese development. The fluid semi-market arrangements tying suppliers to final assemblers has permitted the rapid internal reorganization that flexibility require. Equally the possibility of replacing existing suppliers represents a constant pressure for the smaller firms to sustain their own technological development, both absorbing advanced practice emerging in larger firms and producing their own innovations. Thus, the introduction of new technologies has been facilitated by the flexibility that the small firm sector -- which has never been displaced by traditional modernization -- provided. At the same time, we suspect that during the post-war period of very rapid development relations between small and large firms changed sharply. Earlier, large firms and the Zaibatsu operated somewhat independently, in different sectors and different products. In essence, the small firms facilitated and were transformed during the postwar period of rapid growth.

Japan established an advantage on the one hand in industries in which high-volume standardized production gives quality and cost advantages, and on the other in many dynamic equipment sectors that provide the tools for this production. Competitive advantage in modern volume production sectors hinges not simply on wage rates, but

on the operational control of complex systems that reduce per-unit labor costs substantially. According to the arguments presented here, the Japanese development strategy of controlled competition and rapid growth behind a wall of market closure provided firms the incentives to achieve such competitive advantage.

THE THIRD TIER: DEVELOPMENTAL STRATEGIES
AND INTERNATIONAL TRADE

The third tier of our argument is that the logic of developmental policy and the market dynamics it induces produce particular and troublesome features of Japan's international trade. Our model has implications for both the pattern of trade and the evolution of policy.

The domestic market has been an instrument of promoting the development of advantage for Japanese industry. Policy drives import substitution in targeted sectors. In the developmental years, the policy was clearer and more fully developed. But as we shall see there is substantial evidence the processes are still at work. Where foreign products or technologies are critical to present needs they are imported, but foreign firms are prevented from establishing an entrenched market position. Obviously, there is a tension between firms that produce intermediate goods primarily for the domestic market and those that need world class inputs to produce internationally competitive final goods. Our hypothesis is that the bulk of such conflicts are resolved by permitting imports, but not the entrenchment of foreign firms. Consequently, as Japanese firms develop the technological capacity to produce the necessary intermediate goods, they first substitute for imports in the domestic market and then build from their domestic positions into world markets. Our hypothesis is that an aggressive developmental strategy

based on protection of the domestic market and promotion produces a distinctive pattern of trade.

Our argument also suggests a distinctive pattern of policy development. There is a tension between the Japanese desire to continue to make its developmental system work and international demands that it reconcile its practices to international expectations. The hypothesis here is that as firms establish international competitiveness, formal and informal restrictions on entry may be reduced, but in sectors where Japan wishes to create advantage, developmental policies are maintained in one guise or another. Let us first consider the argument, and then the evidence for it.

-- Trade in Manufactured Goods: The Argument --

Trade in manufactured goods is the most important test of the overall argument because Japan's developmental policy has concentrated on manufacturing, with the expressed intention of moving the manufacturing base from light industry, to capital intensive and volume intensive industry, to high technology sectors. The thrust of developmental policy has been to prevent foreign manufacturing firms from entrenching their position in the Japanese market as a means of assuring the development and international competitiveness of Japanese producers. The size of the domestic market makes a strategy of international competitiveness built around import substitution feasible. One would expect such a policy to produce a reduction in manufactured imports and an expansion in manufactured exports in

those products that have been the target of the import-substitution strategy.

These effects have been realized in two ways. First, policy has directly reduced imports by restriction and promoted exports by subsidy. Second, more importantly and more controversially, because of the size of the Japanese market, temporary policies favoring import substitution have generated enduring marketplace advantage for Japanese firms. In the conditions of the Japanese market, a standard import-industry argument for temporary protection makes sense. Under these conditions, the market is not like a rubberband which when pulled out of shape by policy will snap back into shape when the offending policy is removed. The better analogy is a claylike material which once remodeled holds its new shape.

The effects of past policy on current trade can be seen by imagining a three phase process that in our view represents Japan's post-war development in a range of sectors. In the first phase, Japanese firms are at a disadvantage in both product development and production cost. Consequently foreign firms can dominate the markets, building up their own distribution and service systems. If this occurs, displacing foreign firms will be difficult. Tariffs or quantitative restrictions on imports will encourage foreign firms to open production in Japan to defend their markets. Only outright discrimination preventing foreign firms from establishing distribution, service, and production in Japan can preserve the domestic market for domestic producers. In this first phase, only outright discrimination forcing foreign firms to transfer technology and distribute through Japanese channels will be effective.

In the second phase Japanese firms, by borrowing technology, close much of their product/production disadvantage. They build up distribution and service channels. Foreign firms having lost all or most of their product/production advantage, no longer have a base for easily entering the Japanese market. Moreover, because they are largely excluded from direct contact with the Japanese market and sell mainly through distributors, foreign firms will not design products for Japanese consumers or evolve production processes needed to remain competitive in the rapidly expanding Japanese market. In addition, foreign firms not entrenched in the Japanese market will overlook signs of real product and production innovation by Japanese firms. Consider by contrast the development of American auto producers in Europe where Ford and GM have developed distinctive products for European markets and competitive production processes. By the end of this second phase, direct protectionist policy is no longer crucial. When the policy is relaxed, foreign firms will not flood into the market as they once might have. Indeed, it will become very difficult for foreign firms to establish the corporate infrastructure in the form of personnel and distribution networks required to build enduring market positions for those products where they still retain real advantage.

In the third phase Japanese producers begin to build world market position. They develop distinctive products for the Japanese market that provide the basis for market entry abroad. This was certainly the case in automobiles for example. Now the ordinary market logic of the product cycle will be at work. On the basis of distinctive products, often developed by Japanese firms originally

for Japanese markets, exports can begin and distribution networks abroad can be built. Just as important, the production innovations generated by the logic of declining cost curves will give Japanese producers real cost advantage as well. The presence of foreign producers holding substantial market positions would have precluded Japanese producers from driving down those cost curves in the same way. Having done so, local firms can produce internationally competitive goods that are then pumped into the domestic market through the channels established in the second phase. There are exceptions of course, where the Japanese have not played catch up but have surged ahead. Often, though, where Japanese firms have pushed ahead they have done so in the components -- such as linear micro-circuits and semiconductor memory devices -- where they dominate the final product market at home and abroad or are able to control access to the Japanese market.

-- Trade in Manufactured Goods: The Evidence --

Japan's trade in manufactured goods clearly fits the predictions suggested by our model. The evidence comes both from an analysis of trade data and from sectoral cases. The evidence presented here draws heavily on the recent work of Steven Krasner and Bela Bellassa and the case study work done by BRIE researchers.⁷⁴

Japan's trade in manufactured goods is very different from that of the other advanced countries. The others exchange large quantities of very similar products with each other. Such trade does not rest, in theory, on radically different factor inputs or production costs, but on firm and product specific advantages that

mean some products are exported and other similar ones are imported. Market imperfections and product characteristics shape the levels and direction of such trade. The French sell Renaults to the Germans and the Germans sell BMWs from the French. Such trade differs from each country's trade with the developing countries in which manufactured goods are exchanged for imports of raw materials and semi-manufactures.

Japan, by contrast, tends not to import in those sectors in which it exports. In other words, in manufactured goods where Japanese firms have established a position in world markets, foreign firms are unable to maintain or establish position in Japanese markets. Krasner summarizes it well. "Japan has the most sectorally skewed distribution of imports and exports of any major industrialized country. It has relatively little intra-sectoral trade and imports relatively few manufactured goods in comparison with other major states."⁷⁵ Belassa reaches the same conclusions. One can see from Tables A and B the distinctive pattern of trade. Japan's pattern of manufactured imports contrasts with that of the other major industrial countries. Between 1975 and 1983 the average import penetration ratio for manufactured goods rose from 7.0 to 10.3 in the U.S., from 17.9 to 26.2 in France, from 24.3 to 35.1 in Italy. In Japan it rose from 4.9 to 5.3%. The import penetration ratio in manufactured products from advanced countries rose in Japan from 2.9 to 3.2% while the ratio for the U.S. grew from 4.9 to 6.7, in Germany from 20.5 to 28.9, for France from 15.9 to 22.9.⁷⁶

Table A

Import Penetration Ratios in Manufacturing
(Imports as a percent of Apparent Consumption)^a

	USA	Canada	Belgium	Finland	France	Germany	Italy	Netherlands	Norway	Sweden	U.K.	Australia	Japan
<u>World</u>													
1975	7.01	29.75	64.56	29.40	17.91	24.25	21.92	55.37	43.84	35.12	21.95	22.78	4.94
1983	10.28	28.17	100.30	30.12	26.21	35.11	31.19	67.10	44.29	44.92	29.32	23.45	5.26
1983/1975	146.6	94.7	155.4	102.4	146.3	144.8	142.3	121.2	101.0	127.9	133.6	102.9	106.5
<u>OECD</u>													
1975	4.85	27.97	59.53	24.48	15.86	20.51	18.68	48.79	40.25	30.90	17.58	19.03	2.92
1983	6.65	25.19	90.52	24.39	22.27	28.86	24.90	56.19	39.89	28.58	24.58	18.50	3.16
1983/1975	137.1	92.6	152.1	99.6	140.4	140.7	133.3	115.2	99.1	92.5	139.8	97.2	108.2
<u>Developing Countries</u>													
1975	2.09	1.53	3.75	1.36	1.52	2.61	2.23	4.20	2.24	2.09	2.98	3.43	1.82
1983	3.57	2.15	6.87	1.78	2.95	4.31	4.98	6.73	2.86	2.89	3.47	4.56	2.01
1983/1975	170.8	138.7	183.2	130.9	194.1	165.1	223.1	160.2	127.7	138.3	116.4	132.9	110.4
<u>Japan</u>													
1975	1.16	1.25	1.15	0.86	0.47	0.78	0.41	1.06	3.06	1.12	0.85	4.42	n.d.
1983	2.16	1.88	2.75	2.24	0.92	1.74	0.65	1.96	2.68	2.06	1.78	5.25	n.d.
1983/1975	186.2	150.4	239.1	260.5	195.7	223.1	158.5	185.5	87.6	183.9	209.4	118.8	n.d.
<u>Imports into Japan</u>													
1975	1.39	0.18	0.03	0.01	0.11	0.28	0.09	0.05	0.02	0.05	0.20	0.25	n.d.
1983	1.70	0.21	0.03	0.02	0.13	0.25	0.10	0.04	0.02	0.05	0.16	0.17	n.d.
1983/1975	122.3	116.7	100.0	200.0	118.2	0.89	111.1	0.80	100.0	100.0	0.75	0.68	n.d.

a Apparent consumption is derived as domestic production plus imports minus exports.

Source: Brodin, Anders and Derek Blades, "The OECD Compatible Trade and Production Data Base, 1970-1983," OECD Department of Economics and Statistics, Working Papers No. 31, Paris, OECD, May 1986.

Table taken from Balassa, op. cit., Table 3.

Table B
Manufactured Imports as a Percent of GDP

<u>Country</u>	<u>1970</u>	<u>1980</u>	<u>Percent Increase 1970-1980</u>
Japan	2.41	2.87	19
U.K.	10.76	16.03	57
Italy	7.96	12.70	59
France	9.23	13.09	42
Germany	10.41	15.03	44
USA	3.48	5.73	64
Canada	16.40	20.20	23

Source: Derived from figures in World bank, World Tables, 3rd Edition:
Comparative Economic Data, Table 6 and Country pages, Economic Data, Sheet I,
using current prices to determine imports as a percent of GDP.

Table C

Manufactured Imports as Percentage of Total Imports
1972 -84

	<u>1972</u>	<u>1974</u>	<u>1976</u>	<u>1978</u>	<u>1980</u>	<u>1982</u>	<u>1984</u>
Japan	29%	23%	20%	22%	18%	20%	24%
US	68	55	54	54	49	58	66
EEC	60	55	56	58	53	58	66
EEC, excluding Intra EEC	40	38	40	43	40	41	45

Tables B and C taken from Krasner, op. cit., Table I and Table II.

Engineering products are virtually the prototype of trade among advanced countries and are a critical test of our argument. These products include machinery for specialized industries, office and telecommunications equipment, road motor vehicles, as well as other machinery and household equipment. Many are inputs into further production, so differences in quality and price affect the quality and price of the goods they produce, and many of the buyers are sophisticated. Moreover, specialized firms develop specific product advantages that make their goods attractive abroad, but specific development in foreign firms generates products attractive to domestic buyers. Engineering goods, moreover, are "at the core of Japan's industrial policy."⁷⁷

Krasner's evidence shows the distinctive character of Japan's trade in these sectors. He notes that in the 1972-84 period, engineering products accounted for an average of 8 percent of Japan's imports, 32 percent of US imports, and 18 percent of EEC imports (even if we exclude intra-EEC trade, although that improperly lowers the willingness of European countries to import in these sectors.⁷⁸ (See Table D.) He argues that "while Japan is a major exporter of many kinds of machinery it is not a major importer of any. The highest percentage of imports accounted for by Japan in any category is 5.5 percent.... In most cases, Japanese exports were more than ten times greater than its imports."⁷⁹

Table D

Engineering Products as a Percent of Total Imports

	1972	1974	1976	1978	1980	1982	1984
Japan	11	8	7	9	7	7	9
USA	35	29	28	31	29	34	40
EEC*	26	22	24	27	24	26	27
EEC**	17	14	16	20	18	20	23

* The membership of the European Community increased during this period.

** Excluding intra-EEC trade.

Source: Derived from figures in GATT, International Trade, 1976/77, 1980/81, 1984/85, Appendix tables for Japan, the United States and the European Community.

Table taken from Krasner, op. cit., Table III.

The distinctive Japanese pattern in engineering is evident in its overall trade performance in manufactured products. Using a variety of different measures and even allowing for Japan's distance from other major markets and its considerable dependence on raw material imports, Balassa finds that Japan imports less relative to its GNP than its size and level of development predict. His results indicate that Japan is an outlier compared to all of the other advanced industrial countries -- irrespective of whether one considers imports from all sources, from the industrial countries or from the developing countries and irrespective of whether one considers total imports or just imports of manufactured goods.⁸⁰ As far as trade with developing countries is concerned, Japan's imports from such countries have grown much less rapidly than have the imports of the other advanced industrial countries despite the fact that Japan began at a lower initial level.⁸¹ In other words Japan, whether by policy or competitive will, has resisted the restructuring and shifting of comparative advantage that has occurred in the other advanced countries.

Are there explanations other than present or past discrimination that might account for such outcomes? Exchange rates cannot account for Japan's distinctive pattern of trade, in particular for its tendency relative to other advanced countries not to import in sectors in which it exports, that is not to engage in intra-sectoral trade. But can exchange rates explain differences in overall import penetration in Japan and the other advanced industrial countries? In the decade through 1985 the Japanese yen depreciated in real terms vis a vis the U.S. dollar, but it changed little vis a vis the

European currencies. As Balassa notes, the European countries experienced similar trends in import ratios as the United States. They, like Japan, had sharp increases in their oil bill. Moreover, "Japanese import penetration in Western Europe increased much more rapidly than mutual ratios of import penetration among European countries. And increased Japanese import penetration in the major European countries was not accompanied by increased European import penetration in Japan. In fact the share of Germany and the United Kingdom in the Japanese market declined between 1975 and 1983."⁸²

Perhaps, then, Japanese producers are simply so competitive that their trade pattern reflects existing Japanese advantage. Consider for instance, U.S.-Japanese competition. Any real Japanese advantage should be reflected by Japanese penetration of third markets, that is, markets other than the U.S. and the Japanese. Krasner presents some compelling evidence on Japanese - U.S. competition in third markets. He examines all three-digit SITC numbers under the general designation of machinery for all products in which the U.S. and Japan are among the ten largest exporters in 1982 and either the U.S. or Japan was among the twenty largest importers. He finds that Japanese exports of such products exceeded American exports of such products in third country markets only in 5 of 23 product categories for which data were available. Using sales in third country markets as a predictor of sales for American and Japanese products in each other's market, he finds that there is not one product in which the U.S. is selling more in Japan than would be predicted on the basis of sales in third country markets; in most products it is selling less than

one-fifth, and in many products less than one-tenth of the predicted value.⁸³

Despite the reduction of formal barriers to entry to the Japanese market over the last decade, the basic patterns of Japanese trade have not altered. This suggests either the current patterns of trade reflect past discrimination or that informal mechanisms of protection through policy or business practice continue.⁸⁴ A review of a series of sectoral cases suggest both are true.

In automobiles and commodity semiconductor products, the Japanese position in its home market and world markets cannot be understood without reference to past market closure.⁸⁵ In advanced computers and telecommunication switching equipment, present discrimination clearly exists.⁸⁶ Indeed, in advanced technologies a pattern of continuing and seemingly orchestrated import substitution appears to be at work.

Stories of individual companies are instructive, although they do not permit the same generalizations as aggregate or sectoral data. Consider the experiences of IBM and Texas Instruments. IBM was compelled to license its technology in order to survive in the Japanese market. One senior MITI official stated that "We will take every measure possible to obstruct the success of your business unless you license IBM patents to Japanese firms and charge them no more than a 5% royalty."⁸⁷ As Krasner notes "IBM capitulated, sold the patents and accepted MITI administrative guidance on the number of computers it could market domestically in exchange for the right to manufacture in Japan. The company hired former MITI officials whose loyalty may have been stronger to the Ministry than to IBM. Approval to produce new models was held up if they could compete with

products being developed Japanese firms. Despite being a Japanese company with an almost entirely Japanese staff IBM Japan was kept out of policymaking, indeed it was the target of the policymaking."⁸⁸ In recent years IBM has radically changed both its approach to Japanese firms, treating them as its central competitive challenge, and the organization of its Japan operations. We believe it was in response to these strategies and approaches by the Japanese.

TI's experience was similar to IBM's. It could not form a subsidiary in the 1960s unless it transferred technology to the Japanese. Despite formal "liberalization," its applications to establish a Japanese operation were ignored. Eventually it was permitted to form a joint venture with Sony in exchange for a general licensing of its critical semi-conductor patents.⁸⁹

More formal data confirms the forced transfer of technology. A comparison between the experience of American firms in Japan and in Europe is significant. Krasner's data are again revealing. In Japan the fees and royalties paid by unaffiliated Japanese firms to the United States EXCEEDED the earnings from U.S. direct foreign investment in manufacturing. Such fees from unaffiliated European firms were only 10% of earnings from U.S. direct foreign investment in manufacturing in Europe. In Japan, such fees and royalties by unaffiliated Japanese firms were twice as high as the fees and royalties paid by American firms operating in Japan. In Europe such fees were 38% of fees paid by American firms to themselves for the use of their own technology.⁹⁰ Overall, in the Japanese case American firms could only earn by selling their technology, not exploiting it as a producer.

Overall, our analysis of trade in manufactures is consistent with the predictions of our three phase model showing how developmental policy structures trade outcomes. Moreover, the three phase model is consistent with the history of competition in a range of sectors. Business complaints of discrimination cannot be dismissed as purely special pleading or anecdotes. BRIE analyses of U.S. - Japanese competition in semiconductors and telecommunications indicating persistent market closure in Japan cannot be dismissed as isolated cases. In industry after industry and in country after country, there is a wealth of anecdotal information suggesting a persistent pattern of discrimination against foreign producers in Japanese markets. This information is consistent with the more formal aggregate analyses of Balassa and Krasner revealing significant barriers to import penetration in Japan, even after the formal liberalization of Japanese markets in the late 1960s and early 1970s.

-- The Overall Pattern of Trade --

Japan is a rich industrial country that lacks natural resources, and its general trade pattern reflects that. Like other countries in a similar situation, Japan imports raw materials and exports manufactures to pay for them. Indeed, its ability to sustain increasing national wealth depends on this pattern. As far as the overall structure of trade is concerned, the Japanese pattern is not distinctive. This observation has led some observers to conclude that market forces rather than government policies are the determinants of Japanese trade.⁹¹

Gary Saxonhouse sought to test the notion that Japanese trade patterns are a product of open trade and market processes. He sought to build a model that would allow us to judge whether government policy had influenced Japanese trade patterns. He use a modified version of the Hecksher-Ohlin-Samuelson theory of comparative advantage, which analyzes trade flows in terms of the global distribution of input and production factors. He argues that Japan's manufactured imports as a percentage of its total imports is very low (21.5 percent in 1981 compared to 55 percent in the U.S. and 63.4 percent in Britain). However, he contends that this pattern falls within the normal range of trade outcomes predicted by his model. As Balassa notes, this conclusion is only true if developing countries are included in the standard of comparison. Correctly compared to developed countries alone, Japan is an outlier.

Saxonhouse argues that the aggregate pattern is one in which a raw-material-poor country has built a stock of capital and skilled labor, imports its raw materials, and exports manufactures. This is certainly true; indeed, it is tautological and hardly surprising. But as Balassa demonstrates, even allowing for Japan's excessive dependence on raw material imports, the level of import penetration for manufactured goods is very low compared to that of the other industrial economies.

In Saxonhouse's view, Japan's trading patterns are driven by its high national literacy and national savings, both of which tend to encourage a comparative advantage in trade in capital intensive and knowledge intensive manufactures. The literacy rate is quite remarkable. This can only facilitate the move toward an electronics

economy, and indeed many who know Japan well speak of a love affair with electronics that is the equivalent of the American affair with the automobile a generation ago. It would seem clear that high Japanese saving rates which reduce the scarcity of capital give the Japanese an advantage in industries in which the price or availability of capital resources affects the competitive position of firms. The pool of educated manpower and capital mean that we might well expect Japan's exports to be concentrated in sectors in which capital resources and an educated workforce matter. According to this argument, Japan should increasingly export capital-intensive and knowledge-intensive manufactures. This hypothesis is consistent with empirical evidence on the changing composition of Japanese exports and imports over time. For example, Balassa and Noland find that between 1967 and 1985, Japanese trade shows increasing specialization in human-capital-intensive and R&D-intensive manufactured products at the expense of physical-capital-intensive and in particular unskilled-labor-intensive and natural resource products.⁹²

This argument, although correct, cannot account for Japanese domination of its domestic markets or for the seeming tendency of Japan to import those goods it does not make but not those that it does. The Saxonhouse model by its assumptions and construction cannot explain the distinctive lack of intra-sectoral trade in manufactured goods in Japan. Yet intra-sectoral trade flows are the key to understanding Japanese trading patterns. How in this model, for example, do we account for the enormous stability in American market share in very rapidly growing Japanese markets. As an illustration, in semiconductors the American firms have held roughly

10% of the Japanese market while they have captured 70% of the market outside Japan. At the beginning of the 1970s Japanese producers were not cutting edge competitors on world markets. Between that time and the mid-1980s, the Japanese market for semiconductors grew to match the scale of the American market.⁹³ The industry underwent three virtual product revolutions. The market positions of firms throughout the world were reshuffled. Japan's share of the American and European markets went up. Yet, the American share of the Japanese market remained constant throughout these changes, it neither rose nor fell. Literacy and savings rates cannot account for intra-sectoral patterns of trade such as this one.

There is one explanation, however, that might apply: Japanese design, development, and manufacturing are so inherently superior and have established a dominance so complete that once Japanese producers enter foreign markets, their domestic market is secure. BRIE analyses of the industry indicate that the three phase model of policy supported import substitution described here, lies behind the disclosing advantage of Japanese producers in this and other markets.⁹⁴ This model, based firmly on the notion of the developmental state, rather than the Heckscher-Ohlin model developed by Saxonhouse and based firmly on the notion of the market, is required to understand important features of Japan's trade.

Summary and Conclusion: In sum, the pattern of Japanese trade with the rest of the world is different from the pattern exhibited by any of the other advanced industrial countries. The critical difference is its trade in manufactures. Japan --relative to the other advanced industrial economies-- tends not to import

manufactures in sectors in which it exports. This is consistent with a particular pattern of import substitution. It is our view that Japanese domestic policies for industrial development, adjustment, and managed decline that are intended to affect the production profile of the nation have affected Japan's pattern of foreign trade as well. That pattern reflects outright discrimination and the legacy of past discrimination.

The importance of past discrimination is sometimes underestimated. Past discrimination lives on in the institutions of the economy and the attitudes of the community. Arrangements of suppliers and of distribution have been established in a closed market. They are now remarkably difficult for foreigners to penetrate. Japan for many years was a marginal market for most foreign producers. Being present in Japan was not important to their basic well being. That is no longer true. Japan's emergence as a strategic market, one in which the fate of companies is settled, is an important part of present trade tensions. In many product lines, especially electronic goods and R&D intensive products, entry to the Japanese market now matters, and matters a great deal. Since investments in a Japanese presence was not made earlier, the skills and experience needed to succeed now are not there. There is a serious asymmetry which must now be overcome.

Remarkable views of the impenetrability of the Japanese market serve to make market entry more difficult, sustaining the present pattern of trade. The American Chamber of Commerce in Tokyo jointly sponsored with a Japanese counterpart a now widely publicized study of U.S.-Japanese trade and the possibility of American success in Japan.⁹⁵

The study was conducted by McKinsey and Co. Both the conclusions and the way they were arrived at are instructive. Academics often worry about something called "methodology." The term is a formal way of saying that the way you go about reaching a conclusion and the assumptions you begin with determine the results of an analysis. Given the assumptions, the conclusions of the book are not surprising. The sectors in Japan identified as open for U.S. penetration are service sectors, not manufacturing. What assumptions lead to this conclusion? The self-proclaimed methodology of the U.S.-Japan study group rested on the assumption that in those sectors in which the Japanese were exporters there would be no market for imports in Japan. This is an astounding statement. It means that in any sector in which the Japanese are present as exporters in world markets we should assume as normal the absence of imports. To make the analysis concrete, the position implies that since the Japanese export semiconductors the Americans should abandon their efforts to penetrate the Japanese market. If the Germans or the French were to follow a similar logic, it would then mean that since both are substantial exporters of autos there would be no place for Japanese cars in Europe.

In our argument, the particular Japanese pattern of trade is in important ways the result of policy at a sectoral level. The formal logic we develop is that a closed market in a large country and a pattern of rapid import substitution prevents foreign firms from establishing an enduring position in the domestic market. That is, foreign firms are prevented from using a temporary competitive advantage as a means of building a longer-term position. Intense

domestic competition then builds a product and production base that sustain strong entry into international markets by domestic firms. Entry into the home market by outsiders is initially forbidden, and later made difficult by the entrenched position of domestic producers. The result is a pattern of exports without imports. In some sectors these processes are important; in others they are of much less significance. What matters for this discussion is that a domestic pattern of policy intended to achieve goals of creating advantage, promoting structural adjustment, and managing transition and decline can shape the pattern of trade in a sector and in the country as a whole.

Our approach emphasizing the importance of policy produces the same aggregate predictions as a model resting on traditional factor proportions. Indeed it must because the overall pattern of Japan's trade is not unusual, it must be competitive in manufactures if it is rich as a nation but poor in raw materials. Its competitive position in manufactures must rest on such things as education. Moreover, the general form of trade would be a product of any conscious government policy of development. A decision to promote rapid industrial development in Japan requires that a trade pattern of imported raw materials and exported manufactures be created.

Our approach though does a much better job of accounting for the particular pattern of trade in manufactures and for low import penetration in most manufactured goods in Japan. These characteristics can be explained as a product of the particular form of conscious domestic development adopted by the Japanese.

Finally, it is important to note that our model in no way denies the role of macroeconomic forces, in particular the balance between domestic saving and domestic investment, in the generation of huge current account surpluses in Japan during the 1980s. But the macroeconomic explanation is incomplete for two reasons. First, it assumes that saving and investment are exogenous forces that drive the overall levels of Japan's trade surplus and its current account surplus. In reality, of course, both saving and investment depend upon current levels of economic activity and these in turn are affected by trade. Without growing exports to the U.S. during the 1981-86 period, for example, Japanese economic growth would have been slower, with negative repercussions for domestic saving and perhaps domestic investment as well. Over the longer run, developmental policies that promoted exports and discouraged imports in Japan contributed to domestic expansion that fueled both investment and saving. In short, there is no simple, unidirectional causality between domestic macroeconomic conditions and a country's trade balance or current account balance. Causality runs in both directions. Thus it is erroneous to conclude that the emergence of the huge Japanese trade surpluses of the 1980s had nothing to do with its developmental strategies of promotion and protection, since the cumulative effects of such strategies undoubtedly affected its macroeconomic performance over time.

Second, even accepting the exogeneity of macroeconomic factors, a gap between domestic saving and domestic investment predicts only that a country will experience a current account gap of roughly similar magnitude. Nothing is implied about the level of exports or

the level of imports associated with such a gap. In this respect, the contrast between Germany and Japan in recent years is revealing. Germany has run a large current account surplus with high levels of both exports and imports. In contrast, Japan has run a current account surplus with sharply rising exports and imports that remain low by the standards of the other advanced industrial countries. Japan's performance is consistent with the cumulative effects of the import-substitution strategy described here.

DOES THE DEVELOPMENTAL POLICY CONTINUE?⁹⁶

Does Japan's developmental policy continue? The critical mechanisms of that policy have been protection of the home market and promotion of domestic producers through a variety of means. If these mechanisms continue to operate, they will continue to influence market outcomes. One would expect the same logic of policy and market producing one way trade described earlier to be at work.

Japan is no longer a relatively backward industrial country trying to rebuild and to close technology gaps. It is the second largest national economy in the non-communist world. And its developmental policy, if it persists, no longer affects only traditional sectors such as steel, automobiles, and consumer electronics, but economically and strategically critical sectors such as advanced electronics, biotechnology, and new materials. Will foreign firms in these advancing industries be able to use their advantages to establish enduring positions in the Japanese market? Will a mix of effective protection and domestic promotion recreate the same dynamic and the same pattern of trade in these new sectors as it created in more traditional sectors at an earlier time? Equally, in many traditional sectors, firms from other Asian nations are emerging, building on their advantage of dramatically lower wages. Will firms in such sectors have access to the Japanese market or will Japanese producers continue to be protected?

Real changes have occurred in Japan in the last several years, both in the internal workings of the economy and in its relation to its trading partners. Formal barriers to entry have been reduced. The government role in industrial affairs has been cut back in a large number of sectors. Apparent "liberalization" within and without is thought to be a logical outgrowth of the development of the economy. For example, firms that are richer and technologically more independent are less subject to government influence. Growing wealth and influence reduce the need for government to promote development. Has success made the old role of government obsolete?

In many sectors American and European companies complain that Japanese markets remain closed to outsiders, and that promotional strategies by the government continue to give Japanese companies advantages in international markets. Every country has its arrangements and practices that make business difficult for outsiders. Such practices take many forms in Japan. Perhaps uniquely Japanese are methods of administrative guidance in which MITI or other government agencies give suggestions or advice to private companies, advice that is not binding but that originates with officials "who may have the power to provide or withhold loans, grants, subsidies, licenses, tax concessions and the like."⁹⁷ Other restrictive practices include customs procedures; standards, testing and certification requirements; public procurement; policies to rationalize declining industries; policies to promote high-technology industries; and limited access of foreign suppliers to domestic distribution channels.⁹⁸ Business practice as much as policy keeps the markets insulated. The mix of policy and business practice

combine, in our view, to sustain the powerful processes of manufacturing innovation and import substitution.

-- Loosening or Liberalizing: Posing the Problem --

The American policy debate about Japan has all too often focused on the wrong questions. It has asked "Is the Japanese market open or closed?" or differently, "how far has liberalization gone?". Posed this way, there is not a useful answer. Anecdotes and measures of closure are set against anecdotes and measures of improved access. We are pressed to assess whether to characterize the system as "opening" or "remaining closed" by weighing up these anecdotes and measures. Having said it is one or the other, open or closed, evidence of the opposite is dismissed as either anecdotal or insignificant.

The proper concern is the pattern of change that has occurred. Japan can perfectly well be open in some sectors or types of sectors and closed in others. More properly, the developmental strategy can have become irrelevant or have been abandoned in some areas and continue unabated in others. The proper question is whether the developmental strategy continues, and how it has evolved if it does. Or better still, in which sectors and under what circumstances is the developmental policy mix currently in operation.

If the developmental model has been scrapped then we would expect a broad and even reduction in restrictions on trade. If the model is retained in one form or another, then we would expect to see a selective pattern of protection aimed again at retaining the domestic market for the development of Japanese firms in sectors

intended to promote the continuing structural evolution of the Japanese economy as a whole.

What does the evidence show? A prima facie case for broad liberalization can be made. Under pressure from trading partners abroad, most formal restrictions on entry into the Japanese market have been lifted. There have been genuine efforts at removing formal tariff barriers and other forms of direct discrimination against foreign imports. The Japanese have reduced formal barriers to trade to a greater extent than many of their trade partners. Quota restrictions were reduced from 466 in 1962 to 27 by 1983. The bulk of those remaining (22) are in agriculture, where everyone acknowledges that real protection continues. Japan also lowered its tariff rates to a significant extent in the 1960's and 1970's. On average, tariff rates on nonagricultural products in Japan now approximate those in the European Common Market and in the United States.⁹⁹

Formal barriers, however, are only a part of the story of how the developmental system operates. As the system has evolved, its domain of action has been restricted. Government-led policy no longer seems to try to control the evolution of the whole economy. Not only is it unnecessary but in most sectors firms are too rich, too technologically sophisticated, and too well entrenched in world markets to be easily influenced by the preferences of bureaucrats. However, the instruments of policy and the capacity to resist foreign competitors by protection and promotion remains. Is that capacity used, and if so where?

In our view, the developmental policy continues for two objectives: to ease the transition of declining sectors and to promote the expansion of new industries. In other words, an active interventionist strategy continues in sectors in which the Japanese government would like to create advantage or those in which industry has lost advantage in world markets. In these sectors, arrangements that give structural advantages to the Japanese in their home markets, and often in international markets, endure. The capacity to resist foreign competitors in crucial sectors remains, even though there is a marked reduction in the government's ability to control the domestic economy. The high-technology sectors (microelectronics, machine tools, computers, and telecommunications are examples of currently contested industries) are not, in our view and that of many others, open to full foreign competition.

Indeed, the policies, public remarks, and private statements do suggest a pattern. We propose the hypothesis that restrictions on the ability of foreign firms to develop a permanent presence in the Japanese market have been removed only where Japanese firms have already achieved a dominant position at home and a strong often dominant position abroad. In other words, restrictions have been removed when they don't matter any more. In sectors in which Japanese firms are strong, foreign competitors are unlikely to gain a strong and enduring presence in the Japanese market. Even for such products, the patterns of Japanese trade are different from elsewhere in the advanced world. The inability of strong foreign firms to find products and mechanisms to establish an enduring presence in the Japanese market despite considerable efforts to do so suggests

mechanisms of continued closure be they formal or informal. Markets are open to exports from abroad where Japanese firms continue to need foreign technology. In this case, there is often very rapid import substitution of domestic for foreign products as Japanese producers enter the market. In part, such import substitution reflects market conditions and the domestic strengths of Japanese firms. In part, it appears to us to be a product of collective choice, both governmental and private.

Our hypothesis is that a moving band of protectionism and developmental policy continues. Or differently, there is a moving band of openness. Restrictions in sectors in which Japanese firms are established at home and abroad are loosened. They are, in our view, maintained and combined with selective promotion policies in emerging and declining sectors. It is not, moreover, a simple matter of sunrise or sunset industries; rather it is as much an issue of the reorganization of traditional sectors and the use of the advanced transformative technologies in the reorganization of these sectors.

Protection no longer lies in formal external barriers such as tariffs or quotas. If closure exists, it now rests in a pattern of policy and business practices. Precisely because formal barriers have been removed, evidence on closure is indirect and fragmented. One body of evidence lies in the trade patterns we have considered above. These patterns are consistent with but do not directly demonstrate closure. A second body of evidence lies in a series of cases where foreign products have been denied entry to the market and Japanese competitive products have developed in the vacuum. In some cases such as semiconductors and computers, satellites and satellite

launchers, optical fibre and switching equipment there appears to be an explicit intention of closure to create conditions for Japanese development. The instances are too numerous and form too clear a pattern to be dismissed as anecdotes. In sectors where Japanese policy point to the need for long term development entry is difficult and foreign market share limited.¹⁰⁰

The mechanisms of closure are mixed and do not always rest explicitly in policy. Closure continues in business practices in which quality control engineers reject all foreign products regardless of price.¹⁰¹ It lies in the importance of long-term customer and supplier relationships and the diminished importance of entirely open markets. As Ronald Dore in discussing the textile industry notes, because "imports penetrate into markets, where there are no markets, only a network of established customer relationships, it is hard to make headway."¹⁰² It continues in the wish of bureaucracies, such as NTT, to continue established relationships and practices even when principles are changed at the top. The government's failure to act on Corning Glass's applications for optical fibre patents while Sumitomo with support from NTT developed a competing product is one in a series of instances.¹⁰³

When policy intent gives direction, it becomes easier for informal mechanisms that make markets impenetrable to function. Sometimes the policy intents are very explicit: the software development law that MITI proposed but finally withdrew, the new satellite development policies, and the deregulation of NTT without permitting real access to foreign producers are obvious examples. There are market "openings", sometimes autonomously and sometimes

under intense international pressure, but they often have the feel to outsiders of tactical repositionings not a restructuring of the system itself to permit access.

The difficulty of judging the nature of the changes is evident from considering the mechanisms that neutralized the possibility that capital market liberalization would open the Japanese market to access through takeover. Simply as liberalization proceeded a complex network of cross ownership arrangements were constructed, with the encouragement of the government. Thus, the notion that some "natural features" of the market impede access and are therefore not elements of government policy clouds the reality that the structure itself is often a choice made by or facilitated by government. Okimoto's work reveals this.¹⁰⁴

To judge the pattern of liberalization we must consider whether the bands of developmental policy we predict exist. To do so we consider two sets of policies: those intended to promote "sunrise" industries and those for "sunset" industries. To assess whether a broader opening in the Japanese market is at work or whether in the loosening of control there is a continued developmental bias, we also examine recent policies to alter the dynamics of the financial system. It is these policies, both in general and in their constituent elements, that have created the most intense trade controversy.

Before continuing, it is important to note that political forces have affected and will continue to affect the evolution of Japan's liberalization over time. The process of adjusting the developmental

strategy or of opening domestic markets cannot be simple or straightforward in Japan, because international liberalization directly affects Japanese politics, not least in the form of inter-ministerial struggles over policy direction and responsibility.

International liberalization inevitably means a change in traditional internal policy practices. Such changes are simultaneously promoted and resisted by different interests in Japan. Conflict among interest groups affects the extent, pace and pattern of liberalization in the economy.

-- Policies for "Sunrise" Industries --

Japanese policy is committed to developing the industries of the future, the sunrise industries. It has avowed a determination to shift the country's industrial structure away from the base of heavy and chemical industries and complex manufacturing toward knowledge-intensive industries.¹⁰⁵ The issue is whether the pattern of protection and promotion that characterized the whole economy at an earlier date continues in the sunrise industries. We are not going to review the entire pattern of policy in the range of high technology sectors. Rather we want simply to show enough evidence of continued promotion and protection to make convincing our assertion that the dynamics of expansion and import substitution are still at work and are still sought through policy.

Government efforts to develop each of the important new technology areas -- electronics, new materials, and biotechnology -- are solidly in place in Japan. The range of policies used to promote emerging activities includes formal government legislation and

pronouncements, measures to capitalize on certain features of the domestic market structure for competitive gain, collaborative research and development (R&D) measures, subsidies and tax incentives, and finally, measures to foster industry rationalization and the creation of cartels in designated sectors.

Policy development often begins with a "vision" usually formulated by MITI. MITI's visions (bijon) are merely government-sponsored studies that present a coherent but purposely sketchy outline of likely future trends. These have served not only as public relations ventures --intended to draw attention to concerns the government deems significant-- but also as tools for building a genuine consensus of expectations among groups most directly concerned with the problem at hand.¹⁰⁶ Once a political consensus has been reached, the formal legislation enacted to "give teeth" to those visions and policy statements follows. The case of Japan's computer industries demonstrates that these visions do not remain mere pronouncements once a broad consensus has been reached. In a series of three laws --the Law on Extraordinary Measures for the Promotion of Electronic Industries and the Machinery Industry (June 1957), the Law on Extraordinary Measures for the Promotion of Electronics and the Machinery Industry (April 1971), and the Law on Extraordinary Measures for the Promotion of Specific Machinery and Information Industry (June 1978)-- the computer industry received the benefits (which are discussed in some detail below) of being named a "strategic industry" in Japan's policy scheme.¹⁰⁷

The specific policy instruments accomplish several purposes. Public and private collaborative R&D measures encourage the diffusion

as well as the development of technology among domestic producers.¹⁰⁸ There are a variety of private as well as public joint R and D programs in Japan. A number are organized within particular industrial groups and involve vertical links, applications of a technology developed by one producer to the products of another. Others are in fact horizontal -- that is linking competing producers in research efforts required to reach the product stage. Joint efforts are rarely stable, reflecting shifting needs, market and technological positions of the firms. Equally, they are simply a fraction of research done in Japan, the bulk being proprietary single firm undertakings. They are no less effective for that.

Government sponsored programs are often developed through trade associations and in careful collaboration with potential partners. One mechanism for such efforts is the Engineering Research Association established by the government; another is the action of public/private firms such as NTT. The relations between government agencies in these efforts is as often competitive as collaborative, reflecting shifting needs and positions.

Government research and development funds for selected technologies serve to reduce risk, initiate competition, and signal enduring government interest. While the pool of government funds is not in itself large enough to support corporate programs, it can serve to induce other investments, and corporate commitments. Collaborative public and private R&D efforts have borne fruit for the Japanese. A noteworthy instance of this was the Very-Large-Scale Integrated Circuit (VLSI) Technology Research Association, created by MITI and the Nippon Telephone and Telegraph Company (NTT) in 1976.

Under the direction of MITI and NTT (the government telecommunications monopoly), and with the co-operation of Japan's largest private producers, the VLSI project (1976-1980) assisted Japanese firms in besting their U.S. merchant competitors to move quickly to introduce the 64K Ram and to move into volume production.¹⁰⁹ Dick Samuels nicely summarizes MITI's role, referring to its three functions: first, as cheerleader vis-a-vis the Ministry of Finance to raise funds; second, as champion with the Fair Trade Commission to avoid interference in joint undertakings; and third, as coordinator playing a role of neutral, credible, and authoritative broker to encourage cooperation.¹¹⁰

Joint development efforts could not, in our view emerge and mature quickly and frequently without government creating a mechanism for collective action. It also seems credible that the path of private research and technological development would be different in the absence of these collaborative programs. Several new collaborative technology development programs have been initiated in the last few years.

The program objectives are startlingly ambitious, and the funds involved are staggering in their magnitude. They represent an important shift. The shift is away from programs intended to absorb and diffuse foreign technologies to those intended to create new technological advance.¹¹¹ These programs may prove critical in areas as diverse as human genotyping, where funds are being spent to create a biotechnology breakthrough, and microelectronics.¹¹² In microelectronics, for example, the limit of optical lithography has probably been revealed. MITI is now financing a new collaborative

investment in X-ray lithography. The long-term costs of this one investment are beyond the capacities of even the largest American companies such as ATT. IBM's active support for the joint semiconductor manufacturing effort, Sematech, grows from its genuine concern with the industrial infra-structure of the electronics industries.¹¹³ Okimoto draws some clear conclusions about the continuing and important effects of these Japanese programs.¹¹⁴ His work emphasizes the information technology sectors, but significant programs in biotechnology and new materials continue as well. Crucial in each of these case, we might add, will be the question of foreign research and commercial access to the results and activities.

Government procurement has also served to develop and to diffuse technology. In this regard, the role of NTT as "creative first user" --much as the Department of Defense was in the early history of the U.S. microelectronics industry-- is illustrative of the significance of government procurement in Japanese industrial policy. In addition to controlling the country's telephone and telegraph networks, NTT monopolizes all common carrier network transmission in Japan (including data transmission), offers data processing time-sharing services, licenses all communications, and runs very advanced R&D and systems-engineering laboratories in all of these areas.¹¹⁵

Importantly, NTT is a procurer of systems in these areas from Japan's major electronics companies. NTT's policies, like the policies of some Western-European countries, encourage domestic suppliers and severely restrict the purchase of imported telephone equipment. In the words of one observer: "Technical specifications are based on design rather than performance and are written to favor the specific products of a small group of local suppliers known as the "NTT Family." Because NTT does not have a manufacturing subsidiary (such as Western Electric), it obtains virtually all of its equipment for

the exchange and transmission markets from members of this family of suppliers. NTT has never permitted foreign firms to join this family. NTT's practices of procuring equipment from a relatively small group of trusted suppliers is not unusual, because most Western European phone systems are supplied in the same way. However, the practice of excluding foreign firms, even foreign firms with local subsidiaries, is unusual.[116]

The fact that even such long-established and locally based but foreign owned firms as IBM Japan were excluded catapulted the issue of government procurement in Japan into the trade debate arena. Moreover, as was the case with the VLSI program, the practice of distributing patents, at least initially, only to participating companies --all of which were, of course, in the "family"-- through a research association, is an irritant to Japan's trading partners. Since the signing of the U.S.-Japan Agreement on NTT Procurement, there has been a steady increase in NTT's procurement from American firms. However, it should be noted that there is a wide gap between the performance of foreign firms in the private market (i.e., sales to non-governmental sectors) and their performance in the governmental market (i.e., sales to various government agencies, including NTT).

The question should be posed differently. There are three distinct national strategies for managing the emergence of new telecommunications infrastructure. The United States has deregulated -- that is left market competition to shape the basics of the public infrastructure. The European countries with the debatable exception of Britain have retained a traditional utility structure of regulation. Japan has "reregulated" with a developmental objective -- that is, it is changing the terms of regulation both to provoke competition as a means of assuring rapid diffusion and product

development and to retain public control over the nature of the system as a whole.¹¹⁷ Telecommunications policy is still evolving, and the regulatory strategy is an issue of intense political conflict. (In the next chapter Chalmers Johnson examines this issue in detail.) But NTT will remain the centerpiece of the telecommunications system for two reasons. First, its existing networks and technology provide massive advantages. Second, the acknowledged responsibility of providing universal service will limit the extent of competition the Ministry of Posts and Telecommunications can permit.¹¹⁸ In any case, there is little doubt that the regulation of services will serve as a means to drive the continued evolution of the equipment sector. In a related working paper, Chalmers Johnson examines the policy and politics of the telecommunication sector. 119

The use of standards to structure and channel competition is a third crucial but little explored instrument of developmental policy. Common operating standards, such as those adopted in personal computers and established in machine tools by Fujitsu Fanuc's domination of the controller market. Where such standards exist, competition is channeled away from a struggle about basic operating parameters and into products with different applications. Indeed, if the government's encouragement of standards is intentional promotion --and we cannot judge clearly whether it is-- it is an extremely clever use of market forces. The fact that standards shape competition is of international concern. The international issue is how the standards are set. Product standards, often developed within MITI structure councils, serve to define the lines of an industry's

evolution. American firms note that shortly after the formal promulgation of standards, products flood the market so quickly that they would seem to have been in development during the processes of adopting standards. Thus the Japanese decision to include foreigners in structure-council deliberations is quite important.

The standard setting mechanisms raise a more general problem troubling U.S. Japanese relations. The "transparency" issue has come to represent a thorn in the side of U.S.-Japanese trade relations. Trade negotiators from the United States have repeatedly charged that the American policymaking system is much more "transparent" than the Japanese system and that it is far easier for Japanese officials to know what is going on in Washington and to influence the course of events than it is for any foreigner to have an impact on Japan's highly private, "opaque" processes of decision-making. For this reason, during January of 1984, the then U.S. Undersecretary of Commerce for International Trade, Lionel Olmer succeeded in extracting concessions from the Japanese allowing American representatives access to and permission to address meetings of MITI's Industrial Structure Council. It was, he suggested, merely a matter of reciprocity, no different from the ease with which Japanese and other foreigners can lobby the U.S. government. While there was optimism expressed at the time over Olmer's achievement, there is substantial concern that the concessions have produced no worthwhile results. For instance, even if American representatives are allowed to sit in on the Council's deliberation sessions, they do not have means to influence the decisions of MITI (its sponsoring ministry), not to mention other ministries concerned with a particular issue, or

the trade associations of an industry affected by a council recommendation. Thus, although the "transparency" issue lies submerged, it may not be long forgotten.¹²⁰

Subsidies and tax incentives are a fourth category of promotional policies. Actually, the term "subsidy," as applied to Japanese industrial policy is something of a misnomer. More precisely, subsidies are usually either grants that take the form of conditional loans (hojokin), or government contracted work, that takes the form of consignment payments (itakuhi).¹²¹ Here the case of government subsidies to Japan's machine-tool industry --a case that gained notoriety in this country because of the petition for relief filed by Houdaille Industries-- provides an interesting example.¹²² In this case, the U.S. industry contends that subsidies gave an unfair advantage to Japanese producers. The evidence suggests that the subsidies were designed to support the diffusion of machine tools to Japanese users. The funds serve, in one sense, to create a market for automated production equipment by encouraging use, but equally it encourages the transformation of traditional small and medium sized firms.

Also, certain measures within Japan's corporate tax system are used to target specific industrial policy objectives. For example, the pattern of special depreciation measures tends to be biased toward manufacturing in general, and the measures are purposely geared to stimulate markets for types of goods for which the government would like to see greater domestic production.¹²³ Aircraft is the most recent instance. The market failure of Japan's first entry into the commercial aircraft business saw the government

writing off nearly \$100 million in loans. Its second entry will be jointly financed by the government and a group of firms in a venture with Boeing. These loans lower and diffuse the risk of new ventures.¹²⁴

Finally, policies to promote industry rationalization and to create cartels in designated industries represent a fifth broad category of measures designed to nurture promising new industries. In a 1973 policy statement issued by the Economic Planning Agency, the importance of industry rationalization in Japan's future growth industries is clearly articulated:

At the same time as all industries should be induced to become knowledge-intensive through (1) promoting a higher degree of processing and higher product quality, (2) even when the finished product remains the same, attempting to make the processes of its production and distribution information-intensive, labor-saving, and pollution-free, and (3) trying to systematize vertically several industries from material procurement to processing and distribution or to establish horizontal systems unifying diverse functions.[125]

The Japanese government has encouraged the creation of cartels in designated industries --such as machine tools-- in order to avoid the pitfalls of excess competition. It is believed by many that the Japanese government aids its chosen cartels by its lax enforcement of Japan's Law Concerning Prohibition of Private Monopoly and Maintenance of Fair Trade (the Anti-Monopoly Law).¹²⁶

The intent of the policies, to create advantage in advanced technology sectors, is clear. These cartels may be more interesting for what they say about the intent of policy than about its direct effects. Whatever the intent of the policies to rationalize industries, they have not always achieved their stated purpose.¹²⁷

In the automobile sector, efforts at rationalization were blocked by the stubborn refusal of the smaller companies to follow government plans. In the machine tool industry, a series of plans to force concentration and product controls collapsed.¹²⁸ More may be at issue than simply intent, even when the policies do not achieve their state effects. For the most part, the issue is simply posed as whether the policy achieved its stated goals. Whether, and how, policies altered market structure or behavior is seldom examined.

Sixth, and fundamentally, is the issue of the protection of the domestic market. Here lies the issues of greatest controversy. Our conclusion is that real and effective protection continues both through business practice and government policy. The two are often intertwined. As we have already noted as liberalization proceeded in the capital market, ownership holdings were reshuffled to limit the possibility of disruption through foreign takeover.

In micro-electronics the absolutely steady level of foreign sales through eras in which American firms held absolute advantages through periods in which Japanese firms had surged into the lead in many products and technologies makes the observer doubt that purely market forces are at work. Of course the president of NEC has now argued that the market is wide open and that closure is the result of American inabilities to work hard to make sales. (y) Such public remarks have to be balanced against private comments from Japanese business and government sources that the markets are essentially closed and insistence that in the case of supercomputers that Japan will not buy supercomputers from the United States.

The sense of chosen closure reasserts itself in other advanced sectors such as biotechnology. Here, government policy choice stands out clearly. One Japanese observer concluded that "Japanese bureaucrats and scientists intend to use Japanese hardware for Japanese sequencing efforts, even if US machines are currently available".¹²⁹ Indeed substantial government investments are being made to support the development of Japanese equipment that will compete with American products that are currently doing well in the Japanese market. Even more important in the biotechnology sector than the effort to develop Japanese hardware to displace foreign product are practices concerning repository and data banks for gene and culture information. Internationally open non-profit institutions are presently developing to assure genetic collections and genetic data. In Japan joint programs -- as always involving a set of dominant firms in the sector -- are emerging. Critically there is every impression that unique national repositories and data banks are meant to be alternatives to international ones. If these data banks are supported heavily by corporate funds will they be open to smaller Japanese firms let alone foreign companies. One key here will be whether Japan attempts to develop unique and closed depositories and data bases. A second is where Japanese efforts to commercialize product are situated. 130

In sum, if one takes a range of advanced technological areas in information technologies and biotechnologies, one can only conclude that the mechanisms of market closure that were critical in earlier phases of Japanese growth will operate in this new era. In sunrise

sectors the mechanisms of a developmental strategy are clearly there and the will to use them continually restated.

-- Policy for Sunset Industries:

Measures to Ease the Transition --

The rapid growth of the Japanese economy before 1973 was due in part, to a massive shift of resources from less efficient sectors into new and more efficient sectors.¹³¹ After the oil crisis and the worldwide recession that ensued, Japan had to begin to resist the encroachment of new competitors into its markets, countries trying to follow Japan up the development ladder. Are industrial adjustment efforts in Japan moving in the direction of international economic equilibrium and the redistribution of comparative advantage. In fact, most of Japan's declining industries (whether export-oriented or import-oriented) aim at recapturing their competitive positions through the country's policy of revitalization and relocation rather than seeking to adjust themselves to a retrenched position in a situation of pure market competition. After "structural adjustment" the shares of the export market and the domestic market of firms in Japan's declining industries are not likely to decrease appreciably and, thus, foreign competitors in the relevant Japanese markets may not increase their market share to any great degree. For example, South Korea's shipbuilding orders tend to increase -- not at the expense of Japan's market share, but of the Europeans share! With the exception of a relatively few items (such as polyvinyl chloride and polyethylene), competing products from

abroad (such as aluminum ingots, urea, cardboard and naphthol) are not making great headway in the Japanese market.¹³²

Indeed, it appears that the intent in declining industries (whether export or import oriented) is often to recapture competitive position not simply to scale down capacity. Policy combines domestic and trade policy in ways reminiscent of traditional developmental policies. The domestic market, the evidence suggests, is effectively quite closed in many "sunset" industries. The intent seems to be to create time and market space so that domestic firms have the opportunity to adjust.¹³³ Often in sectors where there is worldwide overcapacity, or where the advanced countries have all lost advantage to the next tier of competitors, the Japanese market has not been successfully penetrated. Import penetration ratios have changed little even in the depressed industries in Japan while they have increased to a significant extent in the other major industrial countries, and production in many industries with worldwide overcapacity such as chemicals, iron and steel, non-ferrous metals and textiles, has grown more rapidly in Japan than in most of these countries. Significantly, in the aluminum industry where the import penetration ratio has increased, offshore subsidiaries of Japanese firms have been the source of growing imports.¹³⁴

The issue of structural adjustment in Japan became significant only in the 1970s, and its rise to salience was the result of four factors: higher costs of energy and raw materials; slower world growth and hence stagnant demand for some traditional Japanese exports; competition from the newly industrializing countries (NICs); and the higher value of the yen. Higher costs of energy and raw

materials had a tremendous impact on import-competing industries such as petrochemicals. Slower growth and stagnant demand sent negative reverberations throughout Japan's shipbuilding industry, and the rise of the NICs contributed to the relative decline of lower value added industries, such as textiles, which for the most part had been in the shadow of technology-intensive and capital-intensive industries since the 1960s. Meanwhile, a higher-priced yen had the effect of drastically altering the terms of trade by exerting pressure on all of Japan's export-oriented industries.

According to MITI, Japan has some eleven structurally depressed industries -- industries that are depressed not in terms of profit rates but in terms of their viability as demonstrated in their production and market conditions. Some characteristics of these troubled industries include: uncontrollable costs of production, dependence on government aid, lack of product diversification, price inelasticity, export dependence, a marked gap between supply and demand, a high degree of competition, and importance for national security. The eleven industries classified as structurally depressed are: textiles, sugar refining, corrugated cardboard, chemical fertilizers, vinyl chloride, open-hearth and electric-furnace steel, aluminum refining, shipbuilding, plywood, and shipping.¹³⁵ A sort of common denominator among these industries is a high rate of capacity and little possibility of upturn even in times of economic recovery.

Japan's policy for structural adjustment in these industries was embodied primarily in a 1978 law that was granted a five-year extension in 1983.¹³⁶ Prior to the enactment of this law --entitled the Temporary Law for Structural Improvement of Specific Industries--

several temporary measures were undertaken to confront the problems caused by the severe recession of 1973-1976 which had a particularly chilling effect on those eleven declining industries. For example, between 1973 and 1977, while the overall rate of capacity use was lower in Japan than in America, the rates of the eleven declining industries were even lower than the average for Japanese industries. The bankruptcy rate was, of course, much higher than average. During these years, a series of recession cartels were installed to cut production and raise prices. In addition, for industries dominated by small enterprises --such as textiles and plywoods-- other ameliorative programs were implemented under the rubric of the Small Industry Switchover Act (1976-1980), which, for example, created a special fund for low-interest loans.

The 1978 law was basically a device to provide some public assistance in exchange for an industry's commitment to reduce capacity (the 1983 law had an additional function, namely to promote cooperation in business operation). To qualify for this assistance, an industry has to apply for the designation of "structurally depressed industry" by demonstrating that most firms in the industry are in dire financial condition, with severe surplus capacity, and agreement must be reached that some capacity scrapping is necessary. After consultation with labor and management, the ministry concerned will then draft a stabilization plan. The main purpose of the operation, of course, is to cut capacity. The major incentive is provided by the Credit Fund (a fund with an 8 billion yen contribution from the government, specifically the Japan Development Bank, and 2 billion yen from private companies, to be used to

guarantee the part of the loan that holds scrapped equipment as collateral). Although there are variations among industries, in most cases the reduction in capacity follows the principle of "proportional cuts" -- in other words, all enterprises in an industry cut the same or a similar percentage of production capacity.

Coordinated capacity reduction is not the whole story, for there is a whole array of additional industry-specific measures that the government has introduced to facilitate structural transformation. In the textile industry, for example, arrangements for the direct purchase of excess capacity have long existed, and in two cases (silk and silk products from China and South Korea) import quotas have actually been set. (It is widely assumed by exporters to Japan that some sort of tacit agreement among Japanese importers serves to erect "informal" import quotas for other categories of foreign textiles.)

In the aluminum refining industry, to give another example, the policy package includes a dual tariff structure (a small quantity of imports almost or entirely duty free, and additional quantities of imports at a higher tariff rate) imposed on the importers of aluminum ingots, the transfer of almost half of the import duty revenue to an industry fund for aluminum smelters, and a variety of subsidies (for R&D in aluminum smelting, for energy-conserving electric power rates, and for lower tax-rates for firms converting their energy base). One should also note that the basic quantity of free or almost tariff-free imports is, incidentally, equivalent to the amount of domestic capacity reduction in the stabilization plan! Moreover, aluminum ingots produced by Japanese-owned smelters overseas are exempt from the limitations of the tariff system.¹³⁷ In the shipbuilding

industry, the Japanese government scrapped its ships ahead of schedule, purchased excess ships from the domestic industry, and used them as foreign aid items, and converted some ships into floating storage facilities for certain strategic materials (chiefly crude petroleum). In short, the government increased its demand to offset declining demand for ships from commercial users.¹³⁸

It should be noted that the government has also introduced several important horizontal policies, policies that are not clearly industry-specific, intended to address the problems caused by declining industries. These include special funds, programs for small and medium-sized enterprises, and measures tailored to aid depression-impacted communities. Employment assistance is designed to encourage the retraining of workers at the factory level and to shore up assistance with the commitment to retraining. Assistance to small and medium enterprises is particularly geared to promoting mergers and switchovers. Community assistance measures are two-fold: incentives are provided to any new industries that are willing to invest in depression-hit areas, and government investment in the infrastructure of these areas also serves to attract new industries.

Cartel action and a mix of sector specific and general support policies are nothing new in the Japanese system. However, the objective of their policy mix is different in "sunset" industries than in the "sunrise" ones. In the former, policy is intended to provide a breathing space during and after which the inefficient firms within a structurally depressed industry will be eased out, while those that are more efficient will be preserved and strengthened. The question that concerns us here is not whether

Japan's policies toward its declining industries have realized these objectives -- although there is ample reason and evidence to think that in any simple sense they have not.¹³⁹ Indeed there is evidence that capacity reduction has not been more rapid in the designated declining sectors than in others. The cartels appear to be mechanisms for managed reduction in oligopolistic sectors.¹⁴⁰

Our concern is the effect on foreign access to the Japanese market of the adjustment programs, whether they have served to protect domestic producers in these industries, shifting more of the burden of adjustment to Japan's trading partners.

The Japanese market, we have already seen, is less permeable to exports from developing countries than the markets of the other advanced industrial countries. Even in the United States, where there are orderly marketing agreements that restrict access to the American market in many sectors, import penetration is still substantial. In steel, autos, and textiles, for example, imports account for more than twenty percent of the American market. Overall, the penetration by the NICs in the American market is several times that in the Japanese market. The penetration by the NICs in manufactured goods into the U.S. is 1.8 times as large in the U.S. as in Japan (see chart).¹⁴¹ The penetration in sectors where American firms have lost advantage in world markets compared with those where Japanese firms have lost advantage in world markets is even higher.¹⁴² Similarly, the United States has in recent years absorbed roughly two-thirds of manufactured exports from the Newly Industrializing Countries, while Japan has absorbed 7% of such exports.¹⁴³

The real difference between Japan and the other advanced industrial countries is at what level of import penetration the domestic market is sealed or protected. Here the figures show the Japanese market to be closed off at very low levels of import penetration. One set of market sealants lies in business practices. Long term business relationships -- what Ronald Dore calls "relational contracting" -- serve to slow or impede shifts provoked by price changes in the market.¹⁴⁴ Purchasing relations do not change immediately in response to changes in market prices. Consequently suppliers have time to adjust. Thus, for example, in the textile industry adjustments in both production costs and product quality were provoked by pressure from importers. Moreover given the role of trading and distribution companies in Japan, buyers can maintain long term control of the market by helping their traditional suppliers adjust. As Dore puts it, there is a " 'natural immunity', making official protection unnecessary , of industries formed by a dense web of 'relational contracting' between firms specializing in different parts of the production process, or between manufacturers and trading companies, between trading companies and retailers..."¹⁴⁵ Dore carefully notes that this "natural immunity" does not last for ever, but that there is a substantial lag and the lag accounts for the slow response of the Japanese economy to import price differential.

Official restrictions, including the adjustment cartels we have discussed, do exist and do matter. Recall our discussion of the aluminum industry. Real adjustments did occur in the face of the

increases in energy costs that put the domestic producers at an absolute cost disadvantage. Domestic production fell, and quickly, from a high of 1,188,197 metric tons in 1977 to 255,900 mt. in 1983.¹⁴⁶ The adjustment however did not result in a radical increase in imports. The domestic industry used breathing space to retreat to offshore production. The move offshore was facilitated both by sharing revenues collected from the special tariff with the industry and by permitting Japanese firms to import duty free. Imports rose but non-Japanese firms continued to have trouble entering the market. Here continued national control of supply proved both an objective and outcome of policy. Where official policy aims at restructuring to retard imports and finance adjustment, then longer term business relationships are likely to prove more enduring. We cannot, once again, unbundle policy and business practice.

-- Finance: Has the Linchpin of the
Developmental System been Removed? --¹⁴⁷

The Japanese financial system has been a crucial instrument of industrial intervention. It does not matter so much whether the instrument was used as one of government leadership, as some would argue, or as an element by which firms wove policies of support creating "policy compacts" and establishing mechanisms of guarantees for their own initiatives. In either case, finance has been a central instrument in Japanese development policies.

There is an ongoing debate about whether the reforms and innovations in the financial systems during the last decade amount to a liberalization or loosening of the developmental system.

Traditional arrangements within the financial system allowed the government both to keep interest rates for all industrial lending low and to influence the flow of funds within the economy. Crucial interest rates within the financial system were set administratively by government, not by market forces. In this situation, the use of available funds could be selectively manipulated by government. In addition, a substantial portion of the flow of funds in the economy passed through government controlled savings institutions (most importantly the postal savings system) and could be directed through specialized lending institutions to government-favored uses. The government's capacity to allocate credit selectively depended in part on the insulation of the Japanese financial system from international markets and in part on the predominance of indirect finance within the system.

Government control of the domestic financial market became entrenched during the Korean War, when special procurements (tokuju) created major financial difficulties and limited investment to satisfy growing consumer demand.¹⁴⁸ The government shaped financial policies to nurture the manufacturing sector. Interest rates were controlled to provide low-cost funds for investment. This policy resulted in a condition called overloaning by city banks, which served to strengthen the banks' power over companies as the banks' share in corporate funding increased.¹⁴⁹ Overloaning increased government influence over the commercial banks, since it left the banks dependent on the Bank of Japan. "Policy loan" decisions by the Japan Development Bank, which had been established at about the same time, were a sort of "divine" signal from on high about the

government's choice of the appropriate directions for bank lending.¹⁵⁰ The policy loans, though not quantitatively large, indicated the government's view of strategic industries. Commercial banks followed these signals and provided loans to the implicitly guaranteed favorites of the government. Providing cheap capital and controlling the allocation of funds were thus linked.

The government-run postal savings system also served as an important tool for inducing a high rate of personal savings.¹⁵¹ The tax-free income on interest from deposit accounts, unique longer term savings instruments, and slightly higher interest rates in this system give the postal savings a competitive advantage over banks (for a more detailed explanation, see Chalmers Johnson, 1982). The Japanese personal saving rate ran between 25 and 30 percent, whereas the American saving rate was only 5 to 6 percent.¹⁵² After the war in Japan, during a period of rapid growth and rebuilding, personal savings were crucial. Such a high personal saving rate, in turn, resulted in a high degree of capital accumulation that could be used for industrial policy purposes.¹⁵³ Specifically, funds deposited in the nationwide system of postal savings accounts were used to create the "second budget" or Fiscal Investment and Loan Plan (FILP), from which the Japan Development Bank (JDB) was authorized to borrow. MITI was able to channel capital into designated sectors or industries by virtue of its power to approve which industries or sectors were to receive loans from the JDB. The JDB loans, as noted above, then influenced the direction of bank lending.¹⁵⁴

The domestic financial system was formally insulated from international capital markets. The Foreign Exchange and Trade

Control Law of 1949, established by SCAP as a temporary measure to safeguard the balance of payments, and the foreign exchange budget it created were used by the Japanese government to protect and to encourage domestic producers. Some steps toward capital liberalization were taken as early as 1967, but a reversed version of the law is still on the books today.¹⁵⁵ The expansion of foreign banks was controlled in a multitude of ways by the Japanese government. Foreign banks were excluded from the Bank of Japan's discount window and could not get loan subsidies from the Japan Development Bank.

Since the end of the 1960s, several concrete steps toward liberalization have been taken, although the process has been slow and uneven. These steps include: (1) giving a greater role to market forces in determining the level of interest rates, and (2) making efforts to liberalize international capital movements. As Japan entered the 1970s, the government's twin policies of encouraging investment through low interest rates and overloaning faced a fundamental problem.¹⁵⁶ Such policies could function only as long as demand could absorb the expanded production resulting from high capital investment.

The 1973-1974 oil crisis severed this chain.¹⁵⁷ Faced with a slow-growth world economy, it became more difficult for firms to expand and sell abroad. Thus government policies to maintain low interest rates to stimulate investment became less crucial. Moreover, there was an excess supply of funds in existence after the oil crisis. Traditional policy measures were no longer desirable or feasible. They were not feasible because an export-oriented growth

program was beginning to cause complex conflicts in a highly integrated but slow-growth world economy.¹⁵⁸ They were not desirable because the overloaning system could have created structural recession in the post-oil crisis era. Such a system encouraged investment decisions that did not reflect true economic costs.

There was a second pressure for liberalizing the Japanese capital market and raising interest rates. Facing the realities of a slow-growth economy, the government concluded that it needed to increase public spending in order to stimulate economic growth.¹⁵⁹ During the high growth period government debt was issued at artificially low rates and absorbed by an underwriting syndicate of banks, securities houses and government financial institutions. Until the mid-70's government debt was minimal and three-fourths was repurchased by the Bank of Japan in coordination with the need for an increasing money supply during high growth. After 1974, therefore, the government deficit soared from 12 percent of GNP to 30 percent of GNP seven years later.¹⁶⁰ Just as issues of government debt increased, the Bank of Japan decreased its repurchases of bonds reflecting the slower growth of the economy. The banks were forced to take up government debt and to hold the major share of government bonds at much lower yield than those available on alternative instruments. This practice squeezed bank profits and reduced liquidity in the system.¹⁶¹ Banks demanded a more efficient financial system with a developed secondary market and long-term instruments to ease the heavy burden of government debt. According to one interpretation, negotiable certificates of deposits (NCDs) were introduced partly as an expression of gratitude by the Ministry

of Finance toward the major banks.¹⁶² As a further concession banks were allowed to engage in underwriting and dealing public bonds.¹⁶³

Facing these difficulties and pressures, the Japanese government took measures to liberalize domestic interest rates beginning in the late 1970s. The first of these measures included: (1) the legitimation of the gensaki market in 1976 (repurchase agreements), and (2) the introduction of negotiable certificates of deposit (NCDs) in 1979.¹⁶⁴ The gensaki market encompasses the conditional purchase and sale of government or corporate bonds for a fixed period with a resale or repurchase agreement at a specified price. Until the introduction of NCDs in 1979, the yield in gensaki was the only free-market rate available to investors. In 1983, the gensaki together with NCDs composed 46.6% of the money market. Further in the early 1980s, medium government bond funds (chuki kokusai fund) similar to MMMF of the United States were established by securities companies. Short and medium term government bond yields and bond yields in the secondary market (98% of which is government securities) have also been liberalized.¹⁶⁵

The introduction of several market-rate financial instruments does not make the entire system one in which prices are set by supply and demand in an open market. Thus, although Pigott has contended many Japanese interest rates are almost as flexible as market-determined rates, he also pointed out that domestic deposit rates are still rigid. Even after the financial reforms, domestic deposit rates remained well below market levels. (For example, in 1981 the three-month saving rate averaged 4.25 percent, whereas the three-month rate in the gensaki market averaged 7.3 percent.) A closer

look reveals that not only deposit rates are regulated but that regulated interest rates still pervade the capital market, money market, and government debt market.

In the capital market expected dividends on loan trusts, issue terms for bonds, and bank debenture rates are regulated to lock in a profit margin for financial institutions. Further, the short term prime rate is tied to the deposit rate and the long term prime rate is tied to yields on investment trusts and financial trusts.¹⁶⁶ The lack of a secondary market for corporate debt facilitates the maintenance of regulated rates.

While progress has been made in liberalizing the money market (Call, bill, gensaki, and CD rates) it is still underdeveloped compared to that of the United States. Measures have been taken to liberalize the interbank market (made up of call and bill discount market) but a recent U.S. congressional report claims that there is excessive Bank of Japan intermediation in the market. Supposedly the rate does not move in response to supply and demand and these market practices leave foreign commercial banks at a complete disadvantage.¹⁶⁷

In the market for government debt again only partial liberalization is apparent. Short term and medium term bonds are sold at auction. Long-term government bonds (10 and 20-year) and five-year bonds, on the other hand, are still allocated to the underwriting syndicate. Although rates on these bonds are determined with greater consideration of market forces than previously they are still administratively controlled.¹⁶⁸ Treasury bills, because they are priced below market rates, are absorbed by the Bank of Japan.

In our view, the financial system continues to be segmented between markets that have been liberalized and those that are controlled.¹⁶⁹ The liberalized markets are for the most part the domain of securities companies which offer a variety of market rate instruments. In contrast only 21.1% of banks liabilities are market determined. The liberalized part of the segmented market tends to deal with big firms which are the best risks while small and medium size borrowers are forced to deal with regional banks or to obtain government subsidies. In 1984, 49% of total lendings by city banks and 67% of those by regional banks went to small enterprises.¹⁷⁰

After the oil crises of the mid-1970s, drastic fluctuations in the current account and wide variations in the value of the yen forced new international policies as well. Several major steps have been taken to liberalize international capital flows since the late 1970s. In 1979 the markets for both gensaki and NCDs were opened to non-residents, thus linking the Japanese capital market to markets abroad. Since 1979, the gap between gensaki rates and market-determined rates of similar instruments (such as the covered, three-month Eurodollar rate) has virtually disappeared.¹⁷¹ According to Hayden, yen assets held by nonresident investors increased almost twelve-fold in the five-and-a-half year period ending in September 1980. In 1980, the Foreign Exchange and Foreign Trade Control Law was revised, and controls over international capital flows were drastically liberalized.¹⁷² Further, in 1984 forward exchange transactions, Eurobond issues by residents, and the swap limit were liberalized.¹⁷³ Now all international capital transactions are permitted unless they are explicitly prohibited by the government.

This shift in the logical basis of policy can be misleading, however, since administrative regulation is still extensive. Nonetheless, it seems clear that the Japanese government can no longer exercise the unfettered control it once did over the country's financial markets (for example, see Hayden, 1982; Patrick, 1983).¹⁷⁴

The 1980's have brought distinctly new problems. Increasing international competitiveness has made many Japanese companies cash rich, further reducing the government's influence over them and its capacity to shape the "policy compacts" that may be formed. Recently, Japan's trade surplus has brought enormous upward pressure on the yen, forcing corporate and community adjustments. Equally important, the trade surplus must be invested -- primarily abroad. With high domestic savings rates already leaving an enormous pool of funds for internal investment, the corporate earnings from the trade surplus are not easily invested in Japan. Moreover, if invested in Japan they would put even greater upward pressure on the yen.

If the surplus is invested abroad, the question is, in what? Until now the bulk has gone into passive portfolio investments, largely in American government securities but more recently in the American stock-market and real-estate. These investments have helped keep American interest rates down and the stock market up despite the huge U.S. fiscal deficit. Direct foreign investment, as long as the Japanese surplus remains at current levels, may remain a small fraction of the total capital outflow. Consequently, it may not be a matter of macro-economic importance. However, such investment may be important in some industries and could change global market structure and global patterns of industrial location.

The questions of the openness of Japanese financial markets to foreign participation cloaks some related questions. Will continued capital market liberalization undermine the capacity of the Ministry of Finance to make macro-economic policy? Certainly, greater entanglement with foreign markets will constrain policy in many ways, but will policy instruments be retained or developed that channel or influence the flow of capital? Will Japan's domestic operations as a surplus nation differ from those of the United States when it was a surplus nation? Our presumption is that they will and that the difference will have international consequences.

Equally, will the surplus be used consciously as a matter of policy to develop Japan's market position in the advanced countries and in the developing nations? How will the longer term development policies of MITI fare in a changing financial environment? Are we witnessing the beginnings of internal financial liberalization or an administratively managed adjustment? It is too soon to answer these questions conclusively, and there are differing interpretations of the available evidence.

Many observers, including most economists, are optimistic about the chances for such liberalization, both domestically and internationally. They are convinced that Japan's links to the international market will compel continued liberalization. They contend that liberalization of international capital movements will induce further liberalization of the domestic financial markets. For example, Makin points out that any effort to peg domestic interest rates below world market rates will cause exchange-rate volatility. Moreover, if capital is mobile internationally, controls in the

domestic financial market cannot provide cheap capital. Funds will simply flow out of Japan to seek a higher return abroad. Full international capital mobility will in fact make domestic financial policy useless. Japanese financial policy can maintain its effectiveness (if any) only during a short period of "transition".

Those who are skeptical about the extent of liberalization raise several issues. They note that administrative liberalization need not represent a real break with an administered financial system. The government retains the means to segment domestic capital markets and to insulate them to some extent from world market conditions. For example, Chalmers Johnson points out that there is an "escape clause" in the revised Foreign Exchange and Foreign Trade Control Law, and notes that although capital flows have been drastically liberalized, the government retains the power to reimpose restrictions if they are perceived as necessary. In 1982 the Japanese government actually resorted to this escape clause to restrict capital outflow. The government can use its emergency intervention power for three purposes: (1) to prevent volatile changes in the exchange rate; (2) to offset a balance of payments problem; and, (3) to avoid economic disruptions that could have a negative impact on the domestic financial market. Moreover, the government designated eleven industries as "vital to the national interest," and the Ministry of Finance is empowered to limit foreign investment in them.¹⁷⁵ As an example of the sort of "illiberal" activities that give one cause to doubt the measures aimed at liberalizing the economy, Johnson points to the case of the Katakura Industries Company.¹⁷⁶

Philip A. Wellons maintains that although the Japanese foreign-exchange laws were formally relaxed in 1980, certain informal constraints that remain are the equivalent of non-tariff barriers in finance. For example, the government can restrict capital mobility by limiting the investment opportunities and controlling the domestic operations of foreign banks.¹⁷⁷ In addition, the high minimum denomination for NCDs and the official ceiling on the amount that banks can issue have constrained liberalization. Lowering the NCD transaction unit and also expanding the NCD issuance framework for banks were among the eight liberalization proposals made in the joint statement of the U.S.-Japan finance ministers. As of the spring of 1987, the minimum maturity of NCDs was reduced to less than one month and the minimum transaction unit was reduced to 50 million yen.¹⁷⁸ Saxonhouse has pointed out that in Japan most yields were not influenced by the relatively large outflow of capital in 1981 and in 1982 seeking higher interest rates abroad.¹⁷⁹ This suggests that even larger outflows are required to influence yields in domestic Japanese markets and that the "transition" to complete integration of markets with world financial markets may be longer than anticipated.

The extent of liberalization of the domestic market is also limited. Of the administratively determined rates, the deposit rate is probably the largest barrier to liberalization. For now, there are big differences between bank saving rates, the cost of funds in Japan, and gensaki rates. Moreover, the share of postal savings as a part of total personal savings has been rising in the past decade or so, and with so much capital invested in postal savings accounts it is questionable whether control of domestic interest rates can be

entirely wrenched away from the government.¹⁸⁰ Whereas the deposit rates of private banks are determined by the Ministry of Finance, the interest rate on the postal savings deposits is determined by the Ministry of Posts and Telecommunications. Thus, even if the MoF agreed to liberalize small deposit rates at private banks, it is doubtful that the highly politicized MPT would follow suit. Most likely it would maintain its regulated interest rates keeping them slightly higher than those of private banks in the name of protecting the small saver.¹⁸¹ As a result, the control of small deposit rates as well as the allocation of postal savings funds through FLIP will remain under government control.

The objective of any policy of deregulation is to increase efficiency of markets by reducing barriers to exchange and widening the range of both goods and market actors involved. Yet deregulation does not necessarily imply that the role of the state is reduced. In fact, it can be argued that government involvement in financial markets will actually increase with liberalization.¹⁸² The crucial question is how will government involvement in materialize? Authorities could follow their past policy of influencing but not overpowering market forces and in the face of liberalization develop new tools with which outcomes in the financial market could be indirectly influenced. Alternatively, policy makers faced with diminishing control over the allocation of financial resources could resort to direct intervention in markets. This second option would involve increased intermediation by public financial institutions which, if realized, could severely harm the efficiency of fund allocation.

Lets examine the first option. The nexus for government control in the private sector, the banks , have been gradually losing their hegemony in financial markets.¹⁸³ The most feasible possibilities for preserving government influence are the following two scenarios. The first would entail the reestablishment of the predominance of banks by allowing them to move into the securities business. Currently banks are prohibited from underwriting corporate securities by Article 65 - Japan's Glass Steagall Act.¹⁸⁴ Rather than suddenly changing the system, the MOF is giving Japanese banks increased degrees of freedom in operations abroad. This will inevitably incite domestic pressures for similar liberalizations. Domestic bankers are strongly in favor of abolishing Article 65 but realize that it will take time. If it is repealed the MOF and BOJ would still be faced with finding ways of controlling the banks' new areas of business, but there is a long history of coordination between banks and authorities so at least there is a foundation to build on.

The second scenario would be to maintain Article 65 and use the growing grey zone between the two industries as a bargaining chip that would allow authorities a great deal of discretion in defining the spheres of business of the banking and securities industries. One line of control that the MOF can exercise is the threat that any concession to the securities industry will be countered by allowing banks further access into the securities industry as a counter concession. The implementation of either of these scenarios would be facilitated by the fact that MOF officials retire into the securities and banking industry often at the Ministry's "recommendation".¹⁸⁵ Yet, before either of these options could be successful,

liberalization would have to occur domestically or both large scale securities and banking transactions will move abroad.

Although government lines of control in the private financial sector have been diminishing, government channels of control in the public financial sector still exist. The growing postal savings system is funneled into the special account for trust fund bureau which in turn goes into FLIP as noted above and more recently has been used to underwrite part of the government's growing debt.¹⁸⁶ Thus, as the role of private intermediaries has been decreasing, the share of funds provided by public financial intermediaries has been steadily increasing. In 1985 the share of government loans in total loans provided was 32.5%.¹⁸⁷ The total amount of FLIP funds grew from 3.4% of GNP in 1955 to 7.1% in 1984. Further, the funds supplied through government financial intermediation relative to total funds supplied to non-financial sectors grew from 10.99% in 1970 to 23.47% in 1985.¹⁸⁸ Both Suzuki and Kuroda contend that if the enlargement of artificially low interest financing by government institutions continues then the business of financial intermediation in Japan will be dominated by government financial institutions that have gained an oligopolistic position.¹⁸⁹ Whereas during the high growth government loans were a signal for private banks to follow suit by investing in the designated industry, the recent enlargement of the public financial institutions is causing direct competition between public and private financial intermediaries. Moreover, low cost funds are still available for the Export-Import Bank and the Japan Development Bank.

The continued regulation of crucial interest rates and the control of a critical channel of savings in the domestic financial system affect the extent to which Japanese financial markets can be fully opened to the outside. A sharp rise in interest rates would affect both the government budget (through higher interest payment) and the financial condition of firms (which still operate in what is largely a credit-based financial system). Therefore we anticipate efforts by the government to continue segmenting the domestic financial system and controlling capital outflows and inflows in a variety of ways. The continued regulation of financial markets will in turn prevent the yen from becoming a fully international currency and will tend to depress its value.

Clearly, a shift is underway in the relations between Japanese financial markets and the international financial system. Several concrete measures have been adopted to liberalize interest rates and international capital movements, and these measures have weakened the government's ability to control domestic financial markets. However, it should not be forgotten that these policy changes were administered by the government, and they do not necessarily denote a willingness on the government's part to completely surrender its control to the vagaries of international market forces. Though shifting economic constraints will limit the choices open to the Japanese, more than one option is always available. Choosing among alternatives will remain a political process, the outcome of a struggle between competing schools of thought about Japan's future. An administratively managed adjustment in which crucial elements of the domestic system are controlled and insulated from international

finance is quite different from an uncontrolled drift toward liberalization.

Liberalization -- Illusion or Reality: The patterns of influence and policy in the Japanese economy have unquestionably evolved. Many of the mechanisms of detailed government intervention have been dismantled or are now irrelevant. Yet, as one Ministry of Finance official remarked in discussing MITI policy: "The techniques of policy have been adapted to new situations, but the underlying purposes of policy remain the same. That must be clearly understood." Attention is now focused on the twin problems of assuring competitiveness in sectors of the future and in sustaining position or moderating decline in industries in which Japan is losing competitiveness. Both of these groups of industries need or can benefit from government support. In the vast bulk of the economy government involvement is less pervasive, but so is its concern. It is precisely in the sectors where government involvement is likely to be greatest --sunrise and sunset industries-- that the interests of Japan's trading partners are most directly affected.

TRADE AND DEVELOPMENT: THE ARGUMENT SUMMARIZED

Developmental policy has affected the pattern of Japanese trade. The pattern of import substitution in the manufacturing sector does not have a purely economic explanation. It cannot be explained by exchange rates or attributed solely to the competitive advantages of Japanese firms and their distinctive geographic location. Policies of discrimination against foreign producers and promotion of domestic ones played a critical role. The purpose of policy was domestic development, and it grew out of a conviction that comparative advantage can be created by intentional government policy.

The system of controlled competition permitted the government to pursue a strategy of creating enduring advantage for national producers in international markets. As we argue throughout this volume, production technologies and factor availabilities, unlike mountains, are not immutable features of a nation's economic topography. There are only a few industrial sectors such as coal or oil in which comparative advantage is given in the form of fixed natural resource availability, and even here production and transportation facilities may alter a seemingly self-evident calculus. . Japanese transportation policy gave its basic industries a cost advantage in importing raw materials. In most sectors -- particularly the manufacturing sectors which dominate the production and trade of advanced industrial countries -- comparative advantage is partly the product of national economic policies. Such policies

in Japan, for example, have influenced the accumulation of physical capital, the pace of research and development, and the development of labor skills and education, all of which underlie the "exogenous" factor "endowments" and production technologies dear to classical theory.

For twenty-five years after World War II, Japanese markets were selectively closed to foreigners while the government actively promoted the expansion of sectors considered critical to its economy. There has been a real asymmetry in trade relations between Japan and the United States, and this in turn affected the international strategies of corporations in both countries. For Japanese firms the American market, which was easily accessible, was the single most important export market and in many sectors a strategically critical market. By contrast, American firms found the Japanese market closed. Moreover, the closed Japanese market was not viewed by American producers as a strategically important or vital export market through the mid 1970s. At most the Japanese market was important for tactical gains and marginal increases in profit. Struggling against trade and direct investment barriers was not worth it for most companies. Of course, as Japan emerged as a powerful industrial rival, many American firms found themselves without the experience and infrastructure required to compete in Japan. Consequently, they were cut off from a growing market, evolving technologies, and an understanding of the strategies of their now powerful rivals. While Japanese firms entrenched themselves in the American market and developed expertise in doing business here, American firms were not allowed to build a position or expertise in

the Japanese market. Now that firms from the two nations are meeting in international competition, this legacy matters. American firms must now learn in a hurry to compete in Japan against very strong competitors. Past discrimination remains an element in today's competition. Without Japan's developmental policies, including protection of its domestic market, the shape of industries from automobiles through electronics would be very different.

Developmental policy continues to ease the transition of declining sectors and to promote the expansion of new industries. In other words, an active interventionist developmental strategy continues in sectors in which the Japanese government would like to create advantage or those in which industry has lost advantage in world markets. In these sectors arrangements that have given structural advantages to the Japanese in their home markets, and often in international markets, have endured.⁶⁶ The capacity to resist foreign competitors in crucial sectors remains, even though there is a marked reduction in the government's ability to control the domestic economy. The high-technology sectors (microelectronics, machine tools, computers, and telecommunications are examples of currently contested industries) are not, in our view and that of many others, open to full foreign competition. Indeed, the pattern of policies, public remarks, and private statements suggests that restrictions on the ability of foreign firms to develop a permanent presence in the Japanese market have been removed where Japanese firms have already achieved a dominant position at home and a strong often dominant position abroad or where the Japanese government does not have explicit developmental objectives, as in some services. In

other words, restrictions have been removed when they have not mattered.

The difficulty of strong foreign firms to find products and mechanisms to establish an enduring presence in the Japanese market despite their growing efforts and attention suggests mechanisms of continuing closure be they formal or informal. Markets are open to exports from abroad where Japanese firms continue to need foreign technology. However, there is often very rapid import substitution of domestic for foreign products as Japanese producers enter the market. Part of that import substitution reflects market conditions and the domestic strengths of Japanese firms. Part of the process of import substitution appears to us to be a product of collective choice, both governmental and private.

Overall, the evidence presented here supports our hypothesis that a moving band of protectionism exists and developmental policy continues. Restrictions in sectors in which Japanese firms are established at home and abroad have been loosened. But they are effectively maintained and combined with selective promotion policies in important emerging and declining sectors.

NOTES

1. There are of course exceptions. Both Zysman and Tyson have in different national contexts addressed these issues. See for example John Zysman, Governments Markets and Growth (Ithaca, NY: Cornell University Press, 1983); and Laura Tyson, The Yugoslav Economy and Its Performance in the 1970's (Berkeley: Institute of International Studies, 1980).
2. The notion of strong/weak state is widely used in political science. In political economy, it is best defined in Steven Krasner, "U.S. Commercial and Monetary Policy: Unraveling the Paradox of External Strength and internal Weakness" in Peter Katzenstein (ed.) Between Power and Plenty (University of Wisconsin Press, 1978). State led growth and the developmental state are found in work by Zysman, Governments, Markets and Growth, op. cit., and Chalmers Johnson, MITI and the Japanese Miracle (Stanford, CA: Stanford University Press, 1982), [the term is first introduced on page 17]. The corporatism debate was reintroduced by Schmitter and best explained by Suzanne Berger in Organizing Interests. Policy compacts is a notion developed by Richard Samuels in his recent book, The Business of the Japanese: Energy Markets in Comparative and Historical perspective, (Ithaca, NY: Cornell University Press, 1987).
3. See for example Thomas C. Smith, Political Change and Industrial Development in Japan: Government Enterprise, 1868-1880 (Stanford, CA: Stanford University Press, 1954); William W. Lockwood, The Economic Development of Japan: Growth and Structural Change, 1868-1938 (Princeton, NJ: Princeton University Press, 1965); Kazuki Ohkawa and Henry Rosovsky, Japanese Economic Growth: rend Acceleration in the Twentieth Century (Stanford, CA: Stanford University Press, 1973).
4. Bruce Cumings makes this argument in "The Origins and Development of the Northeast Asian Political Economy: Industrial Sectors, Product Cycles, and Political Consequences," in Frederick Deyo (ed.) The Political Economy of New Asian Industrialism, (Ithaca, NY: Cornell University Press, 1987).
5. See for example T. J. Pempel, Policy and Politics in Japan: Creative Conservatism (Philadelphia: Temple University Press, 1982), p. 96; Chalmers Johnson, MITI and the Japanese Miracle (Stanford, CA: Stanford University Press, 1982), pp. 11-14; R. P. Dore, "Industrial Relations in Japan and Elsewhere" in Albert M. Craig (ed.), Japan: A Comparative View (Princeton, NJ: Princeton University Press, 1979), p. 327. Soloman Levine and Doji taira, "Interpreting Industrial conflict: the Case of Japan," in Benjamin Martin and Everett M. Kassolow, eds. Labor Relations in Advanced Industrialized societies: Issues and Problems (Washington, D.C.: Carnegie Endowment for International Peace, 1980).
6. Much of this discussion is drawn from the paper by Nobuhiko Sasaki in a seminar for Zysman in the spring of 1986.

7. The best study of the Japanese bureaucracy in development policy is Chalmers Johnson, MITI and the Japanese Economic Miracle (Stanford, CA: Stanford University Press, 1982).
8. The parallel of course is to France. See for example Zysman, Governments, Markets and Growth.
9. Tsuruta Toshimasa "Sengo Nihon no Sangyo Seisaku" (Japanese Industrial Policies in the Post War Period). pp. 24-30. Professor Arisawa Hiromi at the University of Tokyo defended the "developmentalism" position and Nakayama Ichiro, Professor at Hiostsubashi University defended tradeism.
10. Tsuruta op.cit., p. 31. note 16
11. Sasaki, op. cit.
12. Ibid. Tsuruta, op cit. p. 39-40. Johnson, p. 201.
13. Shinohara Miyoei, ed., Sangyo Kozo (Industrial Structure) 1959, p. 77-80; and Shinohara Miyoei "Nihon Kezai no Jukogyo-ka" (Heavy Industrialization of Japanese Economy) 1964, p. 209-225.
14. Murukami Yasusuke "Shin Chukan Taishu no Jidai" (The Age of the New Middle Mass) 1984, p. 115-116.
15. Ibid.
16. Sasaki, Op. Cit.
17. T. J. Pempel, in Katzenstein, ed., Between Power and Plenty, op. cit. Pempel's formulation remains the best available.
18. Johnson, op.cit., p. 17.
19. Akira Goto and Ryohei Wakasugi, "Gisyuto Seisaku" (Technology Policy) in Komiya et. al., Japan's Industrial Policy (Tokyo University Press, 1984), pp. 159 -180. Thanks to Taka Yawada for finding this data.
20. Pempel, in Katzenstein, op. cit.
21. Zysman, Governments Markets and Growth, p. 240.
22. Kozo Yamamura (ed.), Policy and Trade Issues of the Japanese Economy: American and Japanese Perspective (Seattle: University of Washington Press, 1982), article by Murakami.
23. Kozo Yamamura, op. cit.
24. Ibid.
25. This notion has emerged into contemporary social science parlance through Barrington Moore's Social Origins of Democracy and Dictatorship. The best recent use of the concept to understand the political and policy dynamics of the advanced countries in Peter Gourevitch's Politics in Hard Times. His argument suggests that the increasing entrenchment of political and market institutions has increased the importance of institutional structures in shaping political dynamics.
26. This notion is a core of Zysman's Governments, Markets, and Growth. The idea is developed in chapter II. The particular case this notion is applied to is one of financial systems, but the argument is more general. The more general notion is suggested in Zysman, "The French State in the International Economy," in Peter Katzenstein (ed.) Between Power and Plenty.
27. Governments, Markets, and Growth, op. cit. Much of the language here is taken from pages 78-79 of that volume.
28. Okimoto develops this notion in Daniel Okimoto, "Regime Characteristics of Japanese Industrial Policy," in Hugh Patrick (ed.) Japanese High Technology Industry (Washington University Press, 1986).

29. The tactics of coalition building depend on the position of the various groups, partly determined by their positions in the structure of the system and the strategies they have adopted earlier. Gregg Luebbert's work is particularly sensitive to these issues. See, for example, "Social Foundations of Political Order in Interwar Europe," World Politics 39 (July 1987): 449-78.
30. Stockwin, Japan: Divided Politics in a Growth Economy, (London: Weidenfeld and Nicolson, 1982). p. 67.
31. Stockwin, op. cit.
32. T. J. Pempel, Policy and Politics in Japan: Creative Conservatism (Philadelphia: Temple University Press, 1982), pp. 100-109.
33. This process is very similar to the French process. Analyses of the French case in fact bring insight to the Japanese story. See, for example, John Zysman, Governments, Markets and Growth, op. cit., chapter 3; Stephen Cohen, Modern Capitalist Planning: the French Model (Berkeley: U.C. Press, 1977).
34. Zysman, op. cit.
35. Zysman, op. cit., Cohen op. cit.
36. Daniel Okimoto, unpublished manuscript, 1987.
37. Johnson, op. cit.
38. Hiroya Ueno, "The Conception and Evaluation of Japanese Industrial Policy in Kasuo Sato (ed.), Industry and Business in Japan (White Plains, NY: Sharpe, 1980), pp. 400-407.
39. ibid., p. 403
40. Zysman, op. cit.
41. Kozo Yamamura, "General Trading Companies in Japan," in Hugh Patrick, ed., Japanese Industrialization and its Social Consequences, (Berkeley: University of California Press, 1976).
42. S. Miyasaki, "Japanese Structure of Big Business," and Yusaku Futatsugi, "The Measurement of Interfirm Relationships," in Industry and Business in Japan, Kazuo Sato, ed. (White Plains, N.Y.: M.E. Sharpe, 1980).
43. Good studies of the role of small business include that of Akihiro Yoshikawa, Dynamism of Japanese Entrepreneurs: Turbulence Productivity and Innovation, Ph.d. Dissertation, University of California, Berkeley, Economics, 1987; and Fumio Kodama, Taizo Yakushuji, and Mieko Hanaeda, "Structural Characteristics of the Japanese Automotive Supplier Relationship," work in progress.
44. Okimoto, op. cit., p. 41.
45. op. cit., p. 45.
46. MB
47. Hitachi Hiromatsu, Denwa no Muko wa Konna Kao: Denden Kosha KDD no Uchimaku (1980), as cited in An Assessment of International Competition in Microelectronics: the Role of Government Policy in Enhancing Competitiveness (Semiconductor Industry Association: 1987).
48. Akihiro Yoshikawa, "Turbulence in the Japanese Economy: A Schumpeterian Perspective," presented at the 57th Annual Southern Economic Association Conference (November 22-24, 1987, Washington, D.C.).
49. Yoshikawa, op. cit.

50. Ibid.
51. Kodama et al., op. cit.
52. Kenichi Imai, "Japan's Industrial policy for High Technology Industries," paper given to conference on Japan's Industrial Policy in Comparative Perspective, New York, March 17-19, 1984.
53. Nakamura Takafusa, The Postwar Japanese Economy (University of Tokyo Press, 1981).
54. This section is adapted from Stephen Cohen and John Zysman, Manufacturing Matters: The Myth of the Post Industrial Economy (New York: Basic Books, 1987), and from Zysman, Governments Markets and Growth, Op. cit.
55. For an interesting perspective, see Yasusuke Murakami, "Toward a Sociocultural Explanation of Japan's Economic Performance," in Kozo Yamamura, ed., Policy and Trade Issues of the Japanese Economy: American and Japanese Perspectives, (Seattle: University of Washington Press, 1982).
56. Or to use Burton Klein's analysis, the Japanese have a style of continuous production innovation that compels firms to maximize dynamic flexibility. Klein, "Dynamic Competition and Productivity Advances," in Landau and Rosenberg, eds., Positive-Sum Strategies."
57. This figure suggests the difference between a firm with fixed production technology and one in which the production technology is constantly being revised. In the first case, the firm has a concave production curve which may change from time to time. However for extended periods the production technology and consequently the cost curve are fixed. In the second case the technology is constantly evolving. At any moment there is a concave cost curve, but the real choices facing the firm, and the options on which the firm acts, are expressed by the long-term curve connecting several static curves. This dynamic curve is downward sloping, fundamentally altering the logic of the market dynamic.
58. Murakami and Yamamura, "A Technical Note," in Yamamura, op. cit., pp. 115-116.
59. Kozo Yamamura, "Success that Soured: Administrative Guidance and Cartels in Japan," in Yamamura, ed., Policy and Trade Issues of the Japanese Economy, pp.77-112.
60. Ibid.
61. Private conversation.
62. Two sources for the development of the Honda Corporation are Tetsuo Sakiya, Honda Motor: The Men, The Management, The Machines (New York: Harper & Row, 1982; Sol Sanders, Honda: The Man and His Machines (Boston: Little, Brown, 1975).
63. Burton H. Klein, "Dynamic Competition," p.85.
64. Klein, Dynamic Competition, " p. 86.
65. Andrew Sayer, "New Developments in Manufacturing," Working Paper 49 (University of Sussex, Urban and Regional Studies, 1985) p. 19.
66. James C. Abegglen and George Stalk, Jr., Kaisha: The Japanese Corporation (New York: Basic Books, 1985), p. 80.
67. Ibid., p. 96.
68. Abegglen and Stalk, Kaisha, op. cit.
69. Ibid., p. 98.

70. Chalmers Johnson, MITI and the Japanese Miracle (Stanford: Stanford University Press, 1982) is the best available history of the politics of postwar Japanese development.
71. Sayer, "New Developments in Manufacturing," p. 20.
72. David B. Freidman, "Beyond the Age of Ford: The Strategic Basis of Japanese Success in Automobiles," in John Zysman and Laura Tyson, eds., American Industry in International Competition Government Policies and Corporate strategies (Ithaca: Cornell university Press, 1983), chap. 7. See also Abegglen and Stalk, Kaisha.
73. Sayer, "New Developments in Manufacturing."
74. Bella Balassa, "Japanese Trade Policies," prepared for the Institute for International Economics; and Stephen Krasner, Institutional Asymmetries and Japanese Economic Conflict: The Case for Specific Reciprocity (Berkeley: Institute for International Studies, 1987).
75. Ibid.
76. Balassa, p. 12.
77. Krasner, p. 22.
78. ibid., p.24.
79. Krasner, p.26-27.
80. Balassa, op. cit., pp. 8-11.
81. Balassa, op. cit., p. 13. The share of the developing countries in the consumption of manufactured goods in Japan increased to a much lesser extent than in the other major industrial countries. The relevant ratios for 1975 and 1983 are 1.8 and 2.0 percent for Japan, 2.1 and 3.6 for the United States, 1.5 and 3.0 for France, 2.6 and 4.3 in Germany, 2.2 and 5.0 in Italy and 3.0 and 3.5 in the United Kingdom.
82. Balassa, pp. 12-13. Balassa last tested directly for the effects of changes in real exchange rates on national import penetration ratios but failed to find a statistically significant relationship.
83. Krasner table 4 and pp. 33-35.
84. That such informal mechanisms continue to exist is suggested by a wealth of anecdotal evidence. For example, one Japan businessman described his purchasing strategy as follows: First, we buy from ourselves, then we buy from other Japanese producers and only then if we still have unsatisfied demand do we buy from foreign suppliers.
85. Our sectoral studies and work in this area include textiles, apparel, steel, autos, semiconductors, and computers.
86. See Borrus et. al., Telecommunications Development in Comparative Perspective: The New Telecommunications in Europe, Japan and the U.S. (Berkeley: BRIE Working Paper #14, 1985) and Michael Borrus, Chips of State (forthcoming, Ballinger Press, 1987).
87. Krasner op. cit., p.43.
88. Ibid.
89. The TI story is widely told. More detailed accounts can be found in Borrus, Chips of State (Forthcoming Ballinger, 1987). and Krasner, op.cit p.44.
90. Krasner table IX.

91. See, for example, Fred Bergsten and William Cline, The United States - Japan Economic Problem (Washington, D.C.: Institute for International Economics, Cambridge MA, 1986) and Gary Saxonhouse and Kozo Yamamura, Law and Trade Issues of the Japanese: The American and Japanese Perspectives (Seattle: University of Washington Press, 1986).
92. Bela Balassa and Marcus Noland, "The Changing Comparative Advantage of Japan and the United States," in Balassa et al. (eds.) Japan in the World Economy.
93. Michael Borrus, Chips of State (forthcoming, Ballinger 1988)..
94. Baldwin and Krugman (1987) also found that market closure in Japan in the 1970s was critical to the development of an internationally competitive semiconductor industry in Japan. Without protection, Japanese producers could not have competed with U.S. producers in the mid- to late 1970s.
95. "U.S. Japanese Trade," American Chamber of Commerce.
96. This section of the paper draws on work at BRIE for the U.S.-Japan Trade Advisory Commission. Much of the work was done by Brian Woodall and Akihiro Yoshikawa.
97. Balassa, op. cit., p. 29.
98. Ibid.
99. Gary Saxonhouse in Yamamura, ed., Policy and Trade Issues of the Japanese Economy.
100. As an illustration, Cray Computer would note its difficulty selling supercomputers in Japan. Only ___ were sold in Japan during the years _____. However, in the year that Hitachi announced its rival to Cray, it sold ___ supercomputers.
101. Japan Economic Journal, August 30, 1986.
102. Ronald Dore, Flexible Rigidities (Stanford: Stanford University Press, 1986), p. 248.
103. Michael Borrus, "Telecommunications Development in Comparative Perspective: The New Telecommunications in Europe, Japan, and the U.S.," BRIE working Paper 14 (1985).
104. Okimoto, op. cit., p. 84.
105. For evidence of the Japanese government's decision to restructure the economy from a heavy and chemical industries orientation toward a knowledge-intensification of industry, see: Japan Economic Planning Agency, Basic Economic and Social Plan, 1973-1977, (Tokyo: EPA, 1973), pp. 84-85 and passim. Industrial Structure Council, The Vision of MITI Policies in the 1980s (Tokyo: Industrial Bank of Japan, 1980), p. 136.
106. Wheeler, et al., Japanese Industrial Development Policies of the 1980s, ch. III. A related and important point is discussed by Imai, who notes: "On the software side, along with such efforts as implanting in society the concept of increasing importance of information in the economy and the idea of an information society through reports by the Industrial Structure Council (mainly the Information Industry Section) and through publicity concerning such a concept, the government also arranged for the formation of an infrastructure in the information industry through the 'promotion of education and training related to information processing' and the 'expansion and improvement of information processing in government offices.'" Imai, "Japan's Industrial Policy for High Technology Industries," p. 8. For

- more on this notion of what has been termed "human capital investment," see: Reich, The Next American Frontier (New York, NY: Times Books, 1983), pp. 232-282.
107. Former MITI Vice-Minister Yoshihisa Ojimi listed the criteria for determining which industries are to be nurtured as including those "industries where income elasticity of demand is high, technological progress is rapid, and labor productivity rises fast." Organization for Economic Cooperation and Development, The Industrial Policy of Japan (Paris: OECD, 1972), p. 15. For a technical discussion of these criteria, see: Shinohara, Industrial Growth, Trade, and Dynamic Patterns in the Japanese Economy, p. 25.
 108. The details of these mechanisms can be found in a variety of places. Details of the electronics cases can be found in the Houdaille Case involving numerically controlled machine tools, see the legal brief entitled: Houdaille Industries, Inc., Petitioner: 31 July 1982, "Petition to the President of the United States through the Office of the Presidential Discretion Authorized by Section 103 of the Revenue Act of 1971," 26 U.S.C. sect. 48(a)(7)(D). For the television case involving export promotion see Zenith. For the semi-conductor case involving development support see Section 301 (19 U.S.C. 241), as amended by the Trade Agreement of 1979).
 109. Borrus, et al., Responses to the Japanese Challenge in High Technology, p. 68. There is little disagreement about this in other English language sources. Imai puts a different label on these same facts.
 110. See Richard Samuels The Business of the Japanese: Energy Markets in Comparative and historical Perspective (Ithaca, NY: Cornell University Press, 1987), and Richard Samuels and Reginald B. Gilmour (eds.), "Japanese Scientific and Technical Information in the United States," Workshop on Japanese Scientific and Technical Information, Massachusetts Institute of Technology, Workshop Proceedings (Springfield, MA: National technical Information Service, 1983).
 111. There is an ongoing debate about the significance of the latest of the cooperative ventures in computers. Some, such as Ed Feigenbaum from Stanford, attribute great importance to the Fifth-Generation computer program. Others, such as George Lindamood (now with Burroughs), dismiss it as an exercise in the bureaucratic management of new technologies. However, in areas such as new materials and biotechnology, joint projects seem to have much greater potential and significance. By grouping together Japanese firms, it has often been a barrier to foreign market entry. See George Lindamood, "The Role of the Japanese Computer Industry," Office of Naval Research, Scientific Bulletin, Oct./Dec. 1982.
 112. Work on this at BRIE has been conducted by Akihiro Yoshikawa.
 113. IBM's concern with sematech is evident in the role senior executives are now playing. That role recalls the efforts of Erich Bloch in the SRC effort. Bloch, formerly at IBM, is now Director NSF.
 114. Okimoto, op. cit., p. 55.

115. See Johnson in this volume, but also Timothy Curran, "Politics and High Technology: The NTT Case," in I. M. Destler and Hideo Sato, eds., Coping with U.S.-Japanese Economic Conflicts (Lexington, MA: Lexington Books, D. C. Heath and Co., 1982), p. 187.
116. Ibid.
117. See Borrus, Telecommunications Development in Comparative Perspective, op. cit.
118. Nambu, Tsuruhiko, Suzuki Kazuyuki, Honda Tetsushi, "Competition and Government Policy in the Japanese Telecommunications Industry," prepared for the Conference on Technology and Government Policy in Computers and Communications, Brookings Institution, Washington DC, June 4-5, 1987.
119. Chalmers Johnson, "MITI, MPT, and the Telecommunications Wars" BRIE working paper 21 (1986).
120. See Robert Manning, "High Technology High Noon," Far Eastern Economic Review 123 (February 23, 1984): 78-79; "Japanese to Let Americans Join Councils that Advise Industries," New York Times, March 12, 1984; "U.S. Role in Advisory Councils Discussed," Japan Economic Survey 8 (April, 1984): 13-14.
121. T. J. Pempel, "Japanese Foreign Economic Policy," in Katzenstein (ed.), op. cit., p. 161. For a discussion of the role of the Japanese developmental state in "unbundling" the package of control and new technology represented by multinational Corporations, see: Zysman and Cohen, "Double or Nothing: Open Trade and Competitive Industry," in Foreign Affairs (Summer 1983, no.61508) p. 1120.
122. Johnson, MITI and the Japanese Miracle, p. 17. In this case the industry contends the support is an unfair support for producers. The evidence suggests the support is largely in the form of support for users, for diffusion.
123. Borrus et al., Responses to the Japanese Challenge in High Technology p. 82 and passim.
124. David Mowery, Alliance Politics and Economics: Multinational Joint Ventures in Commercial Aircraft (Cambridge, MA: Ballinger Publishing Co., 1987).
125. Japan Economic Planning Agency, Basic Economic and Social Plan, 1973-1977, p. 88-89.
126. For a detailed discussion of Japan's Anti-Monopoly Law, see: Johnson, MITI and the Japanese Miracle, pp. 299-303.
127. Richard Samuels, op. cit.
128. David Bennett Friedman, The Misunderstood Miracle: Politics and the Development of A Hybrid Economy in Japan, MIT Ph.d. Dissertation, Department of Political Science, May 1986.
129. Akihiro Yoshikawa, "Turbulence in the Japanese Economy."
130. Ibid.
131. For a detailed discussion of Japanese efforts to restructure the economy, see: Johnson, MITI and the Japanese Miracle, p. 289-291 and passim; and Ira Magaziner and Thomas Hout, Japanese Industrial Policy, (Berkeley: Institute for International Studies, U.C. Berkeley, 1981) ch. II.
132. For a detailed discussion of Japan's policy for sunset industries, see: Wheeler et al., Japanese Industrial Development Policies in the 1980's ch. VII.

133. Balassa, op. cit., reaches a similar conclusion and provides some compelling anecdotal evidence to support it.
134. Balassa, p.41.
135. See: Japan, Economic White Paper, 1977
136. "Yaritama ni Agatta Sanhoko" (The Structurally Depressed Industries Law Elevated to the Object of Attack), Ekonomisuto (February 7, 1984): 8.
137. Richard Cunningham, "Denial of U.S. Access to Primary Aluminum and aluminum Mill Products Markets in Japan," Student research, 1985.
138. Ibid., as well as field work.
139. See, for example, the evidence in Douglas Anderson, "Managing Retreat: Disinvestment Policy in the U.S. and Japan", in Tom McCraw, ed., America versus Japan (Harvard Business School Press, 1986).
140. Merton J. Pect, Richard C. Levin, and Akira Goto "Picking Losers: Public Policy Toward Declining Industries in Japan"
141. Balassa, "Japanese Trade Policies," p.13.
142. The steel industry is one example. The penetration ratio of steel imports into the U.S. in 1984 was 35.5%, while the penetration steel imports into Japan was 5.7%. The statistics for Japan are from Ichiro Yano, ed., Nippon (Tokyo: Kokuseisha, 1986) p.189; the U.S. statistics are from Statistical Abstract of the U.S. 1987 107th Edition U.S. Department of Commerce, Bureau of Census, 1987. /see also Balassa, p.40.
143. Balassa, "Japanese Trade Policies."
144. Ronald Dore Flexible Rigidities (Stanford: Stanford University Press, 1986).
145. Ibid.
146. Anderson op. cit.
147. Early draft with Akihiro Yoshikawa
Later draft with Julie Herendeen
148. For an overview of Japanese fiscal policies, see Johnson, 1982; Yoshio Suzuki, Money and Banking in Contemporary Japan: the Theoretical Setting and its Application, (New Haven: Yale University Press, 1980); Eisuke Sakakibara, The Japanese Financial System in Comparative Perspective, a Study prepared for the use of the joint economic committee, Congress of Washington, D.C. : U.S. G.P.O., 1983.
149. See Nakamura, 1981, and Henry and Mable Wallich, "Banking and Finance," in H. Patrick and H. Rosovsky, eds., Asia's New Giant (Washington D.C.: Brookings, 1976). The Japanese corporations' equity capital ration was extremely low in Japan. In 1972, the ratio of equity to total capitalization was 18% in Japan whereas it was 51% in the United States. During recession, the Japanese firms suffered since the burden of interest payments and amortization costs greatly depressed profit rates.
150. For activities and impacts of the Japan Development Bank, see Johnson, 1982; Sakakibara and Feldman, 1983; and Philip Tresize and Yoshio Suzuki, "Politics, Government, and Economic Growth in Japan," in Hugh Patrick and Henry Rosovsky, eds., Asia's New Giant (Washington, D.C.: Brookings Institution, 1976). Tresize argues that the impacts of its lending are very slight since such lending is used to finance electrical utilities and other

non-strategic sectors. Johnson and Sakakibara disagree with this view.

151. Interest earnings on a postal savings is tax exempt unless the total deposit exceeds three million yen (the maruyu system). Though bank deposits offer a similar exemption, postal saving is attractive in that it does not require signed statements, thus enabling savers to avoid paying taxes on savings beyond the exemption level. Attempts to eliminate this loophole have been strongly resisted.
152. There are many factors explaining the myth of the high Japanese saving rate. See White Paper on Economics (1982) for a discussion of these factors.
153. Get Akihiro to give us all of these: On the relationship of high savings rate to economic growth, see: Murakami, 1982; Takafusa Nakamura, the Postwar Japanese Economy: its Development and Structure (Tokyo: University of Tokyo Press, 1981); Kazushi Ohkawa and Henry Rosovsky, Japanese Economic Growth and Trend Acceleration in the Twentieth Century (Stanford: Stanford University Press, 1973); Sakakibara and Feldman, 1983; and Sato, 1982.
154. It is widely agreed (see Johnson, 1972; Zysman, 1983) that the policies pursued by the Japanese government had an important impact on the country's rapid economic growth. Those advocating this general view hold that sufficient and low-cost investment funds provided through the system of government guaranteed overloaning was one of the catalysts of Japan's rapid economic growth. Although accepting the fact that certain costs and inefficiencies result from economic controls, those adhering to this line of reasoning maintain that, given the peculiarities of the Japanese financial market (such as predominance of indirect financing and overloaning), certain government interventions were both necessary and effective. With an undeveloped financial market and an inflexible interest rate, it is argued, the government could effectively supply and allocate funds to an industry targeted for growth. It is also possible that the cost of capital will be lower if the market is closed and well managed. Several studies point out that the cost of capital is in fact lower in Japan (see, for example, Flaherty and Itami, 1982). Dissenters to this line of thinking (see, for example, Tresize, 1976 and 1983) argue that these types of governmental controls might possibly stunt growth and development of the Japanese financial market. Without such interventions, the dissenters maintain, it is possible that Japan could have had an even more efficient financial market and an even higher rate of growth in its GNP. Whether a free financial market could or will realize even higher economic growth than under government control is questionable. Advocates of such "market-supreme" hypothesis under free trade and more efficient financial markets, the matching of debtors and investors is easier, and this market efficiency is especially crucial for high-tech venture capital. Wellons (1984) compares Japanese financial markets to more efficient U.S. financial markets, and shows strong doubt toward such views. Assuming that there is no such thing as a perfectly efficient market, it

is probable that the Japanese government played a significant role in improving the efficiency of the financial market. The government intermediaries (i.e. MITI officials and others involved in industrial policy formulation and implementation) acted to reduce the high risks facing private institutions engaged in high-risk projects (this has been described as "socializing risk"). By pooling, socializing, and diversifying the risk of entrepreneurship, the Japanese government was able to create a highly effective system. In this way, therefore, government policies served to reduce market inefficiency and, in particular, the problem of externalities.

155. A large current account surplus of the late 1960s and the early 1970s forced a gradual liberalization of capital market. There was a need to ease capital outflow, and for this purpose the Samurai market (yen-dominated bonds issued by foreign entities) was opened in 1970.
156. See Patrick, 1983; Hayden, 1982; Pigott, 1983; and Kimuna and Sakuma, 1979.
157. See especially Hayden, 1982; and Pigott, 1983.
158. It should be noted also that the high inflation associated with the oil crisis compromised the feasibility of low interest rate policy/ In order to suppress inflation, th government was forced to allow the interest rate to rise.
159. Hayden, 1982.
160. Makin, 1982.
161. Foreign banks are not forced to purchase government debt. Some Japanese bankers maintain that this advantage may offset the disadvantages to foreign banks discussed herein.
162. Hayden, 1982; and Pigott, 1983.
163. "Banking System in Japan" (Federation of Bankers Associations of Japan, 1984) p.19.
164. For the following discussions gensaki and NCD, see Hayden, 1982; and Pigott, 1983.
165. Natalie J. Ohnishi, Japan Market Access Post-Action Program: The Liberalization of the Japanese Financial and Capital Markets (American Chamber of Commerce in Japan, August, 1987) p.36.
166. Yoshio Suzuki, Money, Finance, and Macroeconomic Performance in Japan (New Haven and London: Yale University Press, 1986) p.6.
167. Far East Economic Review 9 April 1987, p.91.
168. Japan Market Access Post-Action Program p.36.
169. Pigott compared the variability of the real call rate versus nominal rates of Japan with that of the U.S. and found that the Japanese rate is essentially a "free-market" yield. He also compared the flexibility of bank lending notes and concluded that the Japanese rates are as flexible as free market would determine. However, he also found deposit rates are still rigid even after those reforms i the financial market, and well below the free market level.
170. Federation of Bankers Association, "Banking system in Japan" 1984.
171. See Economic Report of the President, 1984, chart 2-5; and Pigott, 1983.
172. For details of New Foreign Exchange and Foreign Trade Council, see Seki and Watanabe.

173. Euromoney, April Supplement 1986, p. 119.
174. Hayden, 1982; Patrick, 1983.
175. The eleven industries are textiles, corrugated cardboard, chemical fertilizers, vinyl chloride, open-hearth and electric-furnace steel, aluminum refining, shipbuilding, plywood, and shipping.
176. Responding to growing criticism from abroad, the Ministry of Finance has eliminated such designated company protection systems entirely from the Foreign Exchange and Foreign Trade Control Law. (See: The Japan Economic Journal, February 7, 1984.
177. For description of various attempts to restrict capital mobilities by governments see Phillip Wellons, Passing the Buck: Banks, Governments and Third World Debt (Boston MA.: Harvard Business School Press, 1987).
178. Euromoney, April 1984 supplement, p.119.
179. Gary R. Saxonhouse, "Statement on Japanese Government Policies," Institute of Public Policy Studies Discussion Paper No. 197 Ann Arbor, MI: University of Michigan Press, 1983).
180. See Osamu Hashiguchi's paper in Shukan Economist December 12, 1983.
181. Federation of Bankers Associations of Japan, 1984.p.11.
182. Yoshio Suzuki, Money, Finance, and Macroeconomic Performance in Japan. (New Haven and London: Yale University, 1986).
183. Shoichi Royama, "A note on Comparative Studies in Financial Systems" Paper presented to U.S. - Japan Financial Services Conference, June 1987.
184. Fair Fact Series: Japan's Financial Markets "Corporate Bond Markets" 1987.
185. Far East Economic Review 9 April 1987, p.94.
186. Federation of Bankers Associations of Japan, 1984.
187. Japanese Banks (Zenginko, 1986) p.1.
174. See Yoshio Suzuki, Money, Finance, and Macroeconomic Performance in Japan. (New Haven, London: Yale University Press, 1986); Iwao Kuroda, "Kiny'uu Ron no Sai-Koochiku Wo Semaru 'kiny'uu shakai ka'" (Socialism in the Financial System Forces a Restructuring of Financial Theory). Shuukan Zaisei Jijoo, July, 1981.
188. Shoichi Royama, "A Note on Comparative Studies in Financial Systems" Paper presented to U.S. - Japan Financial Services Conference, June 1987.

- ___ 8. Competitiveness (Vol. III of the Report of the President's Commission on Industrial Competitiveness), Cohen, Teece, Tyson and Zysman, 11/84. 40pp. \$5.00.
- ___ 9. Technological Innovation and Deregulation: The Transformation of the Labor Process in the Insurance Industry, Baran et al., 1/85. 270pp. \$19.00.
- ___ 12. The Impacts of Divestiture and Deregulation: Infrastructural Changes, Manufacturing Transition, and Competition in the United States Telecommunications Industry, Borrus et al., 9/84. 305pp. \$21.00.
- ___ 13. Reversing Attrition: A Strategic Response to the Erosion of U.S. Leadership in Microelectronics, Borrus, 3/85. 40pp. \$5.00.
- ___ 14. Telecommunications Development in Comparative Perspective: The New Telecommunications in Europe, Japan and the U.S., Borrus et al., 5/85. 60pp. \$6.50.
- ___ 15. The Dynamics of Techno-Industrial Emulation: Growth Patterns of Industrial Pre-eminence and U.S.-Japanese Conflicts in High Technology, Yakushiji, 8/85. 180pp. \$14.00.
- ___ 16. Technology and the Relocation of Employment in the Insurance Industry, Ross, 7/86. 125pp. \$10.50.
- ___ 17. Beating Our Plowshares into Double-Edged Swords: The Impact of Pentagon Policies on the Commercialization of Advanced Technologies, Stowsky, 4/86. 60pp. \$6.50.
- ___ 18. High Technology, Economic Policies and World Development, Castells, 3/86. 120pp. \$7.50.
- ___ 19. Innovation in Production: The Benetton Case, Belussi, 3/86. 50pp. \$5.50.
- ___ 20. Conditionality and Adjustment in Socialist Economies: Hungary and Yugoslavia, Tyson et al., 10/84. 52pp. \$5.00.
- ___ 21. MITI, MPT, and the Telecom Wars: How Japan Makes Policy for High Technology, Johnson, 6/86. 95pp. \$7.50.
- ___ 22. The U.S. and the World Economy in Transition, Tyson, 7/86. 30pp. \$4.50.
- ___ 23. Creating Advantage: Strategic Policy for National Competitiveness, Tyson, 1/87. 48pp. \$6.00.
- ___ 24. Adjusting the U.S. Trade Imbalance: A Black Hole in the World Economy, Thurow and Tyson, 3/87. 36pp. \$5.00.
- ___ 25. Information and Communications Technologies for Economic Development, Bar, 6/87. 24pp. \$4.50.
- ___ 26. Dynamic Markets and Mutating Firms: The Changing Organization of Production in Automotive Firms, Quinn, 8/87. 100pp. \$10.00.
- ___ 27. The Weakest Link: Semiconductor Production Equipment, Linkages, and the Limits to International Trade, Stowsky, 8/87. 78pp. \$7.50.
- ___ 28. From Public Access to Private Connections: Network Policy and National Advantage, Bar and Borrus, 9/87. 20pp. \$4.00.
- ___ 29. The Japanese Challenge in Biotechnology: Industrial Policy, Yoshikawa, 11/87. 60pp. \$8.00.
- ___ 30. Politics and Productivity: Developmental Strategy and Production Innovation in Japan, Tyson and Zysman, 11/87. 136pp. \$11.00.
- ___ 31. The Developmental City-State in an Open World Economy: The Singapore Experience, Castells, 2/88. 100pp. \$9.00.
- ___ 32. Manufacturing Innovation and American Industrial Competitiveness, Cohen and Zysman, 2/88. 27pp. \$4.50.
- ___ 33. Japanese Biotechnology: New Drugs, Industrial Organization, Innovation, and Strategic Alliances, Yoshikawa, 1/88. 70pp. \$9.00.
- ___ 34. Perceptions of Work Reorganization: Interviews with Business and Labor Leaders in Four Industries, Turner and Gold, 5/88. 90pp. \$11.00.
- ___ 35. Corporate Strategy Lessons From the Trade Disaster: You Can't Control What You Can't Produce Competitively, Cohen and Zysman, 8/88. 27pp. \$4.50.
- ___ 36. Are Labor-Management Partnerships for Competitiveness Possible in America?: The U.S. Auto Industry Examined, Turner, 10/88. 30pp. \$4.50.