1 Postwar Technological Environment

Schumpeterian Attributes

Since the end of World War II the economic life of Japan has undergone some astonishing changes. The gross national product, which stood at $10.9 billion in 1950, multiplied nearly 19 times over the next two decades and approached $200 billion in 1970. During the 1960s it grew at an average annual rate of 11.5 percent in real terms. This phenomenal growth has given Japan the world's third largest economy, next to the United States and the Soviet Union. Less publicized yet more fundamental than these quantitative achievements, however, are both the increasing sophistication of Japan's industrial structure and the improving quality of its output brought about by technological progress.

Japan's postwar economic growth has been so unexpectedly rapid and revolutionary in character that it is marvelled at as an economic miracle in the world community. War-devastated and ill-nourished only a little over a quarter century ago, Japan has metamorphosed into a modern country, hale and strong, with an economy that dominates competitive trade in world markets. An impressive array of new products was introduced one after another into the producer and consumer goods markets of postwar Japan: synthetic fibers, plastics, petrochemicals, special steels, electric and electronic products, copying machines, computers, and countless other new products. Roughly 40 percent of Japanese industrial output in 1970 was accounted for by new products, those that were included in the official production index only after 1950.[1] This greater variety of products was accompanied by new organizational and managerial techniques, new forms of communication and transportation, and new consumer services. Thus the newness of Japan's postwar economic life is truly far reaching. Joseph A. Schumpeter's description of economic development describes Japan's experience: "[Capitalist economy] is incessantly being revolutionalized from within by new enterprise, i.e., by the intrusion of new methods of production or new commercial opportunities into the industrial structure as it exists at any moment."[2]

Indeed, technological change has been far more extensive than the comparatively simple change in the quality of industrial artifacts. It is a socio-technological phenomenon in which Japanese society is totally immersed.[3]

Japan's capacity to adopt technological changes stems from its culture, the psychology of its people, and the historical momentum of its society.

According to Schumpeter, the recurrent development of major technological changes initiated by innovators and later followed by others "in swarmlike appearance" is the essential mechanism of an economic boom with a prolonged period of readjustment and adaptations.[4] Innovation is thus the prime mover for a long-run trend of economic growth since a vast amount of new investment ensues in the wake of each boom. With internationalization of business operations, innovations are disseminated at an accelerated rate not only within a country but also across national borders.

Japan's economic growth since 1950, following its initial reconstruction period in the late 1940s, was founded upon high rates of capital formation that resulted, in the main, from the continuous assimilation of new technologies purchased from the West. In the terms of the Schumpeterian paradigm, Japanese industry was engulfed en masse in a swarm of Japanese entrepreneurs who avidly acquired Western industrial arts. Since the technological gap was substantial, their effort to catch up extended over a prolonged period, resulting in continuous buoyancy of industrial activity, accompanied by phenomenal growth in the stock of capital. No one would deny that without the huge backlog of industrial technology made available by Western manufacturers, the Japanese could never have achieved such swift industrial recovery and continuous expansion.

It was not only the entrepreneurs who were continuously on the lookout for promising new technologies and ready to adopt them as soon as they appeared; Japanese workers and consumers were equally outward looking and bold in experimenting with new methods and new ways of industrial life. They accepted modern Western patterns of industrial life, notably mass production and mass consumption, with amazing ease. Assisted by the accommodating characteristics of company unions and the traditional practice of lifetime employment, workers were quite willing to experiment with productivity-raising mechanization and organization, since they had no fear of losing their jobs. Japanese consumers' faithful emulation of higher Western standards of consumption was clearly a key element in creating vast domestic markets for goods manufactured with imported

technology and, in particular, for those marketed under well-known foreign brands.

The radically new modes of production and consumption which thus emerged revitalized Japan's industrial system. Again, this pattern is exactly what Schumpeter stressed:

> . . . development consists primarily in employing existing resources in a different way, in doing new things with them irrespective of whether these resources increased or not. In the treatment of shorter epochs, moreover, this is even true in a more tangible sense. Different methods of employment, and not saving and increase in the available quantity of labor, have changed the face of the economic world in the last fifty years.[5]

Although Kenneth K. Kurihara cautioned against applying the monistic Schumpeterian theory to the intricate and complex process of Japan's postwar economic development, some of his incisive observations were clearly Schumpeterian:

> The Japanese experience demonstrates, for the first time in modern economic history, the feasibility of an economy growing rapidly in spite of scarce natural resources. The permanent loss of colonial sources of raw material (that is, Korea, Formosa, Saghalien, and "Manchukuo") intensified the existing scarcity of natural resources in the defeated island nation, and yet Japan surmounted this handicap through the indigenous substitution of technological innovation, manpower utilization, and foreign trade expansion for natural resources.
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> Japan suffered greater devastation of material and human resources than the other vanquished nations (Germany and Italy). . . . These wartime losses did not prevent the Japanese economy from growing faster than the Germany and Italian economies, not only by augmenting the quantity of capital but, most important, through a better technical combination of available capital and labor and greater productivities of those factors.[6]

A uniquely Schumpeterian aspect of Japan's postwar economy was its method of financing investments. In Schumpeter's model, the money market serves as "the headquarters of the capitalist system" from which entrepreneurs obtain "funds of purchasing power" in the form of credit from bankers.[7] It is estimated that as much as 70 percent of postwar investment capital in Japan came from banks, while 30 percent was raised internally out of retained earnings. An inverse ratio prevails in the United States, where borrowed capital, on the average, accounts for roughly 30 percent

and internal financing for the rest.[8] Predictably, such a financial method is amazing to many Western observers. For example, Robert Guillain, a noted French journalist, observed:

In order to accomplish all this [new expansion] they have poured in money so lavishly that their country now leads the world as far as investment is concerned. In some of the most advanced industries, equipment is often renewed at a rhythm that leaves Western competitors breathless; it is renewed in spite of the risk of making nearly all machinery out of date before it has been written off. Japan is poor in capital, and the problem of investment—that is to say, the finding of money to finance the continued renewal of equipment and the race for new factories—might have been a great hindrance to development. But here the country managed to overcome the difficulty by the use of the most surprising financial methods, and it is here that the extreme boldness of the managerial class is apparent. They never hesitated to run deeply into debt to set up their new installations, and they borrowed enormous sums of money from the banks. By agreeing to these loans, the banks in their turn displayed a most adventurous spirit, although it is true that it would all have come to nothing without the backing of the central bank, the Bank of Japan.*

Also implicit in the above observation is the working of what Schumpeter called "creative destruction." Many economists have noted the persistence of excess productive capacity in Japan's booming economy. Leon Hollerman, for instance, stated that according to an unpublished MITI (The Ministry of International Trade and Industry) survey, Japan's manufacturing industry was operating at 81.2 percent of its capacity in 1960 and that even in the booming year of 1964 it was producing at only 82.4 percent of capacity.[9] It is worth stressing that the nature of excess capacity in Japan was due not to a lack of aggregate demand, the usual cause of excess capacities in a stagnated economy, but in no small measure to a continuous buildup of productive capacity, which was made even at "the risk of making nearly all machinery out of date before it has been written off."[10] Thus the seemingly contradictory phenomenon of excess capacity in the booming Japanese economy reflected, at least in part, a process of creative destruction in its productive facilities; that is, a continual shift of production activity from old to newly installed and more efficient manufacturing facilities in pursuit of higher productivity.[11]

*From The Japanese Challenge by Robert Guillain, translated by Patrick O'Brian, p. 62, copyright © 1970 by J.B. Lippincott Company, reprinted by permission of the publisher.

In light of the above, Schumpeter's model fits the pattern of Japan's postwar economic development nicely; indeed, no other country in the postwar period could provide such a cogent example. Nevertheless, a word of caution is in order. Japan's experience involves a host of intricate workings of developmental processes which cannot be adequately analyzed within the broad Schumpeterian framework. The Keynesian approach is certainly needed if one wishes to examine the high rate of saving in Japan and its effect on capital formation and growth, the marginal propensity to import and the effect of economic growth on the balance of payments, the fiscal and monetary policy apparatus, and many other macroeconomic problems. Even a Marxian mode of analysis may be necessary to dramatize the problems of equity in the distribution of wealth and income, the welfare of workers, and the dual industrial structure that tends to discriminate against small-scale enterprises.[12] Equally necessary is an ecological analysis of the impact of Japan's impetuous industrial expansion on the natural environment and the quality of life.

Though Schumpeter's model is admittedly deficient in dealing with many of the detailed and intricate operations of modern Japanese economy, it does come to grips with the essential, dynamic undercurrents of Japan's industrial experience. After all, technological change and capital formation were the major catalytic agents that transformed postwar Japanese economy with such decisiveness and swiftness. Japan's economic miracle clearly resulted from technological achievement.

The Mechanism of Technological Diffusion: Product Life Cycle

It is traditional in economic analysis to treat the state of the industrial arts as a parameter of the economic system which can change only in the long run. With the acceleration of technological progress and the rapid diffusion of knowledge in modern times, a country's technological capacity may be enlarged within a surprisingly short span of time. Technological progress transforming the entire structure of an industry can occur within as little as three to five years. Indeed, this is exactly what many Japanese industries have experienced in the course of assimilating Western technology.

Licensing agreements and the overseas manufacturing operations of international corporations are the main channels of international transfers of

technology. The oligopolistic market structure—a familiar feature of high-technology industries—may discourage a diffusion of industrial know-how among competing firms at home. Yet with the internationalization of their corporate operations, innovating firms may quickly transmit their latest technologies to their overseas subsidiaries and affiliates. International diffusion of technology may thus in some cases be even swifter and more effective than intracountry diffusion.

The product life cycle theory of trade is a new trade model that recognizes the quickened pace of international diffusion of technology and its effect on the pattern of trade.[13] According to this model, also known as the neotechnology account of international trade, new products catering to the demand of high-income consumers and to the labor-saving requirement of producers were first introduced in the United States, which has the highest per capita income and wage level in the world. In addition to affluent and emulative mass consumption markets that are amenable to new products and favorable to scale economies, the United States is also richly endowed with R & D resources, scientific and engineering skills, entrepreneurial and managerial talents, and above all, venture capital.[14]

Once a new product is successfully marketed in the United States, it may be exported to other countries with a similar demand structure or per capita income.[15] Thus at the initial stages of the new product's life cycle, the United States enjoys a comparative, in fact, absolute, advantage in exporting it. Later in the cycle, however, as technological difficulties are eliminated, the production process is standardized, and market acceptability develops overseas, the U.S. advantage in the new product tends to be eroded; firms in other countries which enjoy a variety of local advantages, including lower labor costs, will eventually start to produce for their own markets—and may even export later on. As a result, the United States may end up importing the very product originated in its own market.

Sensing this inevitable erosion of competitiveness, the original U.S. firm itself may foreshorten the diffusion process; it may quickly move into foreign markets through licensing agreements or foreign direct investment in an effort to retain control over its technological advantage.[16] The firm's propensity to take such an action will be stronger the more experience the

firm has with overseas markets through its exporting and servicing operations, since the marginal costs of entry are already reduced.[17]

At this juncture, the product life cycle theory of trade links up to the theory of direct investment within the framework of monopolistic competition advanced by Stephen Hymer.[18] Hymer asserts that to operate successfully in a foreign market the firm must possess both a unique advantage over local firms, such as patents or differentiated products, and a strong desire to exploit such advantage.

As will be substantiated in later chapters, there is plenty of evidence that Japanese firms have actually capitalized on the product cycle sequence and the special incentives that accrue to the latecomer. Japanese followers were particularly quick in learning to reduce high initial production costs as they rapidly accumulated production and marketing experience in new products and industries under the favorable impact of their high-level economic growth. This competitive effect is discussed by Abegglen and Rapp in their approach combining the product cycle theory and the learning-by-doing hypothesis.[19] Indeed, Japanese firms have played no small part in shortening the life span of the original advantage of many U.S. firms.

By combining models of trade and investment theories, one might have predicted what actually happened next: more and more, U.S. firms became interested in setting up factories in Japan with their own capital and technology rather than licensing Japanese firms. This desire was frustrated, at least initially, by Japanese government restrictions on foreign corporate ownership. However, the recent open door policy has considerably eased controls on direct foreign investment in Japan.[20]

Chasing-Up Competition and Industrial Shedding

The phrase oiage kohka (chasing-up effect) has recently been added to the vocabulary of popular economics in Japan. It describes the effect of rising competition from developing countries on Japanese industry. As developing countries such as Taiwan, South Korea, and Singapore succeed in building light-manufacturing export industries, Japan's share of world trade in those industries will be gradually pared. Export products in which Japan's

competitiveness has already declined are cotton textiles, toys, wigs, metal tablewares, umbrellas, baseball gloves, rubber and plastic footwear, and other labor-intensive products. This trend was inevitably accentuated by recent revaluations of the Japanese yen, which eliminated the hidden price advantage of Japanese exports. To stay ahead of this unavoidable decline in traditional exports, Japan must upgrade its industrial structure by moving into more technologically sophisticated lines of industrial activity. Thus, having succeeded by means of advanced industrial know-how acquired from the West, Japan is, in turn, being chased up the ladder of industrial progress by rising competition from developing countries. Ever since Japan opened up commerce with the West in the 1860s it has demonstrated a peculiar knack for adapting to a changing world economic environment. Once again, the Japanese are demonstrating their unique adaptability in responding to the chasing-up competition from developing countries.

More and more, those segments of Japan's industry in which its comparative advantage is slipping away are being transferred to developing countries in the form of direct foreign investment. These industrial transplants are accompanied by Japanese managerial and ownership controls as well as by the transfer of production techniques and marketing skills. Because of labor shortages at home, those workers who are displaced—both currently and potentially—by the overseas migration of traditional industries can be readily absorbed into expanding, more sophisticated modern industries, with the overall result of an increase in labor productivity.

Industrial transformation at home under the pressure of the chasing-up competition is not without friction however; declining industries such as textiles, toys, and sundries are composed of many small and medium-sized enterprises. Needless to say, not all of them are interested in or capable of moving their operations into neighboring developing countries. By and large, manufacturers whose products are mainly exported opt for overseas production more readily than those whose products are mostly marketed at home, since the former are in a much better position to gain the international perspective and managerial skills required for overseas operations. After all, the export-oriented manufacturers have a stake in defending their overseas markets.

According to a recent survey, the major barriers to overseas investment for small and medium-sized enterprises are inability to communicate adequately abroad (that is, lack of knowledge of English or the local language) and unfamiliarity with local conditions.[21] In view of this, both government and private institutions provide guidance and assistance for this type of manufacturer. For example, Shokoh Chukin Bank, a semigovernmental bank designed to assist small and medium-sized enterprises, is active in providing advice and loans to firms interested in overseas ventures. With the encouragement of MITI all the major city branches of the Japan Chamber of Commerce have set up a free consultation program and technical assistance for overseas investment. The Institute of Developing Economies (formerly, the Institute of Asian Economic Affairs) also provides information on investment environments in Asian countries.

But perhaps the most practical and effective help is offered by Japan's powerful trading companies, which have themselves become active participants in multinational operations. Until recently, trading firms engaged in, and profited from, assisting Japanese manufacturers in domestic as well as overseas trade. In 1968, for example, their share of Japan's foreign trade was 48.2 percent in exports and 63.1 percent in imports.[22]

Although their go-between role in international trade is still significant and is even expanding in third-country trade involving the exports of less-developed countries that lack marketing ability, the trading companies are no longer content to operate as commission brokers. Instead, they are actively investing in overseas ventures that offer new opportunities for longer-term profits; they can serve as intermediaries, on a continuous basis, for the exports of required machinery, equipment, and unfinished products from Japan to their overseas ventures, and for the marketing of their overseas output in both local and export markets.[23] Moreover, they can share in the long run growth of the overseas investments in which they participate.

The strength of the trading companies lies in their worldwide network of marketing facilities, well staffed with experts trained in local languages and experienced in negotiating with local authorities and business interests. They can offer not only managerial and marketing skills but also strong

financial backup. Their services are particularly attractive to small and medium-sized enterprises interested in overseas operations.

In developing countries, therefore, many Japanese ventures exhibit the following pattern of capital ownership: about 50 percent of the total capital is locally owned, 20–30 percent is owned by the Japanese manufacturer involved, and the balance is financed by a trading company. The trading companies' share of capital ownership in manufacturing ventures is generally much larger in advanced countries where foreign capital ownership is less restricted and risks are much lower.[24]

Despite all the assistance rendered to this type of company, there are still a large number of small and medium-sized manufacturers of traditional products which are desperately struggling to remain competitive at home. Although their economic power has been weakened, they still retain a political clout. As a result, Japan's preferential tariff program for imports from developing countries, which was initiated on August 1, 1971, under the pressure exerted by the UNCTAD conferences, is largely a political gesture to lend an ear to the aspiration of developing countries to earn foreign exchange through "trade, not aid." It is expected that, at least for a time, the government will be slow in opening up domestic markets for imports directly competitive with declining industries. The future schedule of Japan's tariff preference program is likely to be synchronized with its effort to modernize domestic industries with the minimum possible disturbance to those firms still remaining in the declining sector.

In the meantime, small and medium-sized firms threatened by competition from developing countries will be assisted to move their production to labor-abundant countries. Thus Japan's manufacturing investments in developing countries may be increasingly designed to partake of the benefits of its own preferential tariffs conferred on developing countries. This is an interesting, and perhaps efficient, variant of adjustment assistance to import-injured firms.[25]

Some developing countries, such as South Korea and Taiwan, are outgrowing the stage of development which depends on light-manufacturing industries and beginning to emphasize the development of heavy and chem-

ical industries. But the Japanese economy is not as much threatened by this new development as it might have been only a few years ago. The transition of economic development in Japan's neighbor countries is taking place at a most opportune time; Japan now wants to shed some of its heavy and chemical industries, and is quite willing to transfer them to neighboring countries, particularly those industries whose further development at home entails high ecological costs.

Although Japan's postwar economic policy of emphasizing large-scale heavy and chemical industries has been impressively successful, it has had a host of undesirable effects both at home and overseas. In the first place, since Japan is a small island nation, the supply of industrial sites has quickly diminished, and the problem of pollution caused by high levels of production and consumption has nearly reached the level of a public health hazard. The labor supply, particularly of factory workers, has become extremely scarce, causing wage rates to rise phenomenally.

On the trade front, the upsurge in Japan's exports to foreign countries, especially to the United States, was met there by a loud clamor for protection by local industries. Industrial expansion centered in heavy and chemical industries has been accompanied by rising import dependence on the foreign supply of natural resources, which has meant increased vulnerability of the Japanese economy as well as a potential source of conflict with other resource-importing industrial countries.

The rapidly rising social costs of industrial expansion at home have finally forced Japan to reexamine its postwar industrial policy. A recently emerged consumerism has also added fuel to the dissatisfaction of the people with the postwar pursuit of GNP growthmanship, carried out as it was at the cost of deterioration of their living environment.

It was against this background that the Japanese government, in its 1971 White Paper on International Trade and Industry, announced an epoch-making policy for the economy to follow in the future. The new policy emphasizes a reorientation of the economy away from "pollution-prone" and "natural-resource-consuming" heavy and chemical industries and toward "clean" and "brain-intensive" industries. On the international

front, it stresses a greater reliance than before on exports which compete in quality, variety, and sophisticated design rather than in price.

These housecleaning operations imply an encouragement of the migration not only of labor-intensive conventional industries but also of heavy and chemical industries. MITI is reportedly working on a blueprint to alter the industrial structure with special taxes and other fiscal measures.[26]

Sensing this new trend, some developing countries are showing eagerness to attract Japan's fading industries such as the manufacture of metal castings, bicycles, sewing machines, telescopes, ceramics, leather products, and the like. South Korea, in particular, appears interested in strengthening labor-intensive industries such as these, so that with its relatively cheap but efficient manpower, it can develop export competitiveness.[27] This type of industrial transfer may, however, be a temporary phenomenon, as the developing countries eventually stress the development of more sophisticated industries.

Japan also is extending assistance to heavy industries; for example, it is helping establish an integrated steel complex in South Korea—a project that only a few years before had been judged premature for the Korean economy and turned down by a consortium of U.S. and European companies. Admittedly, the Korean project might have been influenced by political considerations rather than by the recently announced policy consideration. But MITI is reportedly considering the possibility of a regional industrial-development plan which envisages the establishment of heavy and chemical industries, specifically steel and petrochemicals, in other Asian countries.[28]

The shipbuilding industry, Japan's star export industry, has been active recently in assisting developing countries to build shipyards. Ishikawajima-Harima Heavy Industries Co., which already has shipyards under joint venture with the local governments in Brazil and Singapore, is going to set up another joint venture in Turkey. Other major shipyards, such as Mitsubishi, Sumitomo, and Kawasaki, are also in the stage of negotiation with developing countries. Although they are diluting their own competitiveness by fostering foreign builders, the sale of a variety of machinery and equipment that their diversified shipyards can produce is being encouraged.

Besides, since shipbuilding is a highly labor-intensive industry, Japan may eventually lose its hegemony to labor-abundant developing countries. Joint ventures overseas will at least ensure partial control and long-run profits.

Outflows of direct investment capital to other advanced countries whose markets have hitherto been served mainly by exports are growing likewise. Rising protectionism in the United States and Europe as a reaction to Japan's lopsided trade surpluses has necessitated a switch of Japanese manufacturers' strategy from exports to either local production or third-country production.[29]

In sum, Japan is in the midst of industrial reorganization, shedding and transferring to developing countries those segments of its industry in which it is losing comparative advantages or can no longer expand because of domestic problems of congestion and pollution resulting from the high density of industrial concentration. Japan also is shifting from exports to production in Western countries themselves. No doubt the recent revaluations of the yen boosted both its interest in investing overseas and its capacity to do so, since the revaluations eliminated its export price advantage and since Japanese firms were able to make investments overseas in appreciated currency. Indeed, one may even argue that the appreciation of the yen, which was forced upon Japan by the successive devaluations of the U.S. dollar, occurred at a most opportune time, since many Japanese industries had already reached a physical limit of expansion at home and many of their exports had captured overseas markets to such an extent that any further expansion was politically undesirable in local markets. As the undervalued yen and the relatively free trade policy of the West, particularly of the United States, helped Japan's exports in the past, so may the revalued yen and the open-arm welcome extended presently by the United States to the inflow of Japanese capital assist Japan's new economic penetration of the U.S. market.

Needless to say, whether Japan can continue to renovate the industrial structure to its advantage remains to be seen. Future political and social developments both at home and overseas are unseen constraints on the momentum of Japan's industrial progress, which is now in the new stage of overseas expansion.

The Economic Action of Challenge and Response: Adaptive Dynamism

As a middle-advanced country in terms of per capita income and living standard, Japan finds itself in a psychologically ambivalent situation; it has a deep-seated inferiority complex; it admires the West, but at the same time it feels superior to neighboring Asian countries. This very ambivalence, however, provides a double-pronged challenge to the Japanese. The West has long been, and still is, a paragon of modernity and industrialization, a model that the Japanese wish to emulate. On the other hand, their pride in being the only truly industrialized country in Asia is an equally powerful motive for them to continue to advance lest they be overtaken by neighboring countries.

Japan's tactic has been to chart carefully its modernization as coordinated responses to challenges—opportunities or threats—in the world economic environment. As Arnold J. Toynbee has emphasized, what counts in the formation of a civilization is the reaction of a nation to external stimuli, adversities encountered on the path of its endeavors, and not the weight of the inanimate objects of its environment.[30] Indeed, it is futile to try to explain Japan's industrial progress and its trade competitiveness in terms of its domestic economic environment, which is characterized by an exiguity of natural resources and by frequent natural hazards such as typhoons, earthquakes, and tidal waves. In fact, any attempt to find a reason for Japan's economic success in its physical make-up only reaffirms its mystique as an economic miracle.

The secrets of Japan's success lie in its capacity to react to adverse conditions in positive ways and turn them into advantages. For example, a limited supply of industrial sites led the Japanese to reclaim coastal areas to create many ideal polders for steelworks and petrochemical plants. They proved to be extremely efficient in handling bulky raw materials and transporting finished outputs by ocean routes. On the trade front, Japan has shown equally remarkable foresight and adaptability, building productive capacities in those industrial sectors where the world's demands have rapidly been expanding. Its export expansion in automobiles (some with rotary engines), huge oil tankers, motorcycles, transistor radios, miniature TV sets, desk-top calculators, and the like has been the result of entrepreneurial and technological adaptability—and in fact, of little else.

The conventional factor endowments theory of trade throws little light on the adaptive dynamism of the Japanese economy. To be sure, Japan has a relatively abundant, highly skilled and disciplined labor force suitable for mass-producing modern products; this is no doubt a factor in its comparative advantage. But a more fundamental question that should be asked is, How has Japan come to develop export competitiveness in, say, technology-based products?[31] The factor endowments theory is essentially static and cross sectional in analysis; it can only broadly illuminate the pattern of trade at a given point in time, but it cannot by itself explain or predict the creation and demise of a country's comparative advantage, particularly in a technology-based manufacture.

In this respect, an eclectic approach combining the product cycle theory, the learning-by-doing theory and the analysis of the effect of the chasing-up competition seems to provide a more appropriate framework for understanding Japan's dynamic trade competitiveness. For Japan's export strength lies in adroitly maneuvering in the changing world economic environment.

The revaluation of yen, forced on Japan by the successive devaluations of the U.S. dollar, has already proved to be a benefit for Japan as its industry expands overseas through direct investment. Even the Middle East oil crisis may be turned to advantage in the long run. As we see in Chapter 5, Japan has started earnestly to develop alternative energy resources, such as solar and geothermal energy, by stepping up research efforts. In addition, because of the oil crisis, Japan's efforts to develop independent oil sources will not create as much friction with Western oil interests as they would have in the past. Japan's economic ties with Arab nations will inevitably be strengthened as it eagerly provides industrial and technological assistance for the economic development of the Arab world in return for an assured supply of oil on which Japan is currently so dependent. As a result, Japanese industry will very likely gain strong footholds in the rich Arab markets.

As Charles P. Kindleberger succinctly puts it, "The world of foreign trade is one of change. It makes a great difference to the trade of different countries, and to the impact of trade on them, whether they are capable of changing with the world."[32]