The Japanese Strategy

Japan's Development Strategy as a Lesson or a Threat to Global Economic Order

MUSTAFIZUR RAHMAN

The phenomenal economic development of Japan in the post World War II era has drawn the attention of the industrialized world. Through the 1960s and 1970s scholars and researchers carried out studies to discover what Japan made phenomenal success, and he lists sixteen drivings forces which led to this development. Economic planners, politicians and the industrial community every where watched as Japan emerged as a formidable force in the changed global economic order in the 1980's.

This book provides some insight into the reasons for Japan's success. This insight is based on the author's extensive study of the Japanese society and their industrial development. It attempts to answer whether Japan's experience and strategy can be emulated by other countries of South and South-East Asia, or if that strategy has some elements of "threat" to our global economic order!

Based on first-hand experience of the author who has lived in Japan for more than 25 years, the book also brings to light other non-economic factors such as their work ethic, social institutions and structure which has given Japan a very unique management system.

This is an essential reference book for policy planners, economists and for students of Japanese affairs at universities. The business and industrial communities will find the book of special interest.

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Preface

Contrary to earlier common impression of Japan as the only Far East Asian country that was devasted in World War II and once flooded the world market with cheap textiles and other cheap and low-quality products, the reality of today is that there is hardly any country in the world that does not have some form of economic relation with Japan. Most of the industrialized countries suffer trade deficits (Japan's trade surplus in the fiscal year ending March 1991 was US$113.44 billion and that in 1992 was US$136.051 billion. These figures would be much higher if the import of precious metals for reserve and stockpiling is included.) with her, while many developing countries heavily depend on her for economic or technical assistance, or loans. Most households all over the world are now using Japanese products under Japanese brand names or in foreign brands supplied by Japanese companies in the original equipment manufacturer (OEM) arrangement. Japanese spare parts or components are widely used in prominent brands of industrial or consumer products throughout the world. They are no more of low quality or cheap.

International financial institutions are going to be more and more dependent on Japanese finance. The top five commercial banks of the world (as of 1990) in terms of assets and deposits are now Japanese. The exchange rate of the Japanese currency fixed at ¥360 to a dollar between 25 April 1949 and 28 August1971 is now floating at around ¥90 to a dollar (as of 1 August 1995). The yen is now a powerful international currency which many countries are using in their reserves. Japan is now the single biggest purchaser of the United States (US) government deficit finance bonds (US budget deficit in the fiscal year 1991 was US$269 billion, which was estimated to be above US$375 billion in the fiscal year 1992.

The total outstanding US government debt is near US$4 trillion, and the tax payers paid interest of US$286 billion, more than the national security bill of US$262 billion in 1991.). Many well-known corporations of the USA and the European Community (EC) now actually belong to the Japanese. All records of direct foreign investment by the USA and the European countries over centuries are now shattered by Japan just over a few years only (Japan's direct overseas investment as of end of the fiscal 1991 was US$352.392 billion, US$148.554 billion being in the USA alone, as against the USA investment of only US$9.907 billion in Japan.). The speed and scale of the recent Japanese investment in overseas real estate, particularly in Australia, the USA, and the EC has become a myth in itself. Mitsubishi Estate Company's purchase of the Rockfeller Centre, Daiichi America Real Estate's acquisition of the Tiffiny Building, Bridgestone Tire Company's purchase of Firestone Tyre and Rubber Company, Sony's takeover of Columbia Pictures, and Matsushita's acquisition of MCA, among others, created a stir in the USA. Japan's net overseas assets of US$514 billion, as of end of 1992, is highest among all the countries of the world exceeding US$345.40 billion of Germany (unified former West Germany and East Germany) as against net overseas liabilities of US$412.20 billion (at the end of 1990) of the USA.

Japan is now a prominent member of the powerful Group of Seven industrialized nations (G-7). It is modestly aspiring for a top share-holder position in the World Bank and the International Monetary Fund (IMF). It exerts considerable influence over decisions of the Asian Development Bank (ADB), traditionally headed by a Japanese President. It is now sounding out the possibility of gaining permanent membership of the United Nations (UN) Security Council when it is revamped in the future and get herself cleared from the stigma of being referred to as an "enemy nation" in the UN Charter, and have a voice in world affairs befitting her economic status. Although Japan denounces war in her 1946 constitution, the USA counted on her for more than US$9 billion contribution towards expenses in the recent Gulf War (1991) led by the USA under UN Security Council cover to expel Iraq from Kuwait, which it had invaded and occupied on 2 August 1990. The UN peace keeping operations in Cambodia were expecting Japan to bear about a third of its expenses estimated at US$1.70 billion up to July 1993 for the UN Transitional Authority in Cambodia (UNTAC) headed by

Yasushi Akashi, a Japanese. It has now started to send the Japanese self defense force abroad on UN peace keeping mission. The present exercise of leadership by the USA in providing the so-called AID of more than US$24 billion to the Commonwealth of Independent States (CIS), a group of member countries of the former Soviet Union, depends heavily on contributions by Japan which is now trying to find an opportunity to get back the four disputed northern islands captured by the Soviet Union during the last days of World War II. The USA and the EC countries, and more recently Russia, the traditional technological powers, are now seeking technological cooperation of Japan in even aerospace and nuclear fields so far believed to be their monopoly. In large-scale future science projects like super conducting super collider project, fusion energy project, and the like, the USA is seeking Japan's participation. Japan's technology is also involved in the US defense industries.

The West now wonders whether they should consider Japan as a global partner, a rival, or as a potential threat.

The announcement of the US dollar defense package, namely, 10% surtax on imports, 7% devaluation of dollar with respect to major international currency and nonconvertibility of dollar (to gold) by president Nixon in mid-August 1971 was termed as a 'Nixon shock' in Japan. There was an economic panic. Share prices fell 50% in a day or two. This panic triggered a recession in other advanced countries, but to the surprise of other developed countries the stock market in Japan not only recovered to its previous level in about three months, it managed to rise further quite sharply.

Before Japan had adjusted itself to stable growth in place of high growth of the earlier periods, the oil crisis came in 1973 still as a bigger blow to Japan's economy. The rocketing inflation pervaded the world. But, again to the astonishment of the world, it managed to reduce its energy consumption by more than 10% and adopted rationalization policies to keep the cost of production reasonably low. The gap between the inflation rate in Japan and other advanced countries gave Japan a further competitive edge and bigger profit margin in many areas of export.

The energy-efficient small Japanese cars were finding large market in the USA and Europe. Japan's trade surplus was swelling to the envy of its trading partners in the world.

In electronics and other high-technology areas, including personal computers and office automation equipment, Japan's market share was increasing to a level not acceptable to many Western countries which imposed anti-dumping duties on Japan and made her voluntarily restrain export of automobiles and other products to the USA and the EC under bilateral agreement outside the scope of the General Agreement on Tariffs and Trade (GATT), now known as World Trade Organization (WTO). But nothing could put a stop to its soaring trade surplus. The USA, the champion of "free trade" and "market economy", is now not only resorting to "Japan bashing" but also taking indirect protectionist measures which it has been criticizing for years as "non-tariff barriers" that Japan is said to have been adopting ever since its start of its industrialization process. Japan, which has so far chosen to keep silent about any criticism by the USA, her biggest postwar trade partner, is now venturing to term the USA as the "most questionable" of her 10 major trade partners in a draft report by the Industrial Structure Council, a government advisory body to the powerful Ministry of International Trade and Industry (MITI) for what it terms "unfair trade manners". The unfairness in trade practices has been judged from a study focussing on 11 areas in 10 of which the USA is found "questionable". These issues are import restrictions, government procurement, unilateral action against other countries, extension of domestic antitrust policy to foreign countries, antidumping measures, origin rules, product standards, tariffs, protection of intellectual properties, regulations on foreign investment, and regulations on services. The 121-page draft report also criticizes the EC as being unfair in eight of these 11 areas, including what it calls "discriminatory restrictions" on imports from Japan. It also names South Korea, Australia, Indonesia, Canada, and Thailand as nations with high tariffs. In the field of technology, the USA is blaming Japan for not providing protection to its intellectual properties and discriminating against US technology holders in granting patents, citing the example of the 1990 grant of patent rights to the Texas Instruments of the USA on integrated circuit technology 29 years after it applied. The American side says that the delay was deliberate to allow the Japanese industry to attain parity into the fields of electronics without the protection of patent constraints.

The developed countries of the West are now wondering as to what their economic future would be in the face of Japanese ad-

vancement and whether economic blocks like the European Common Market and the North American free trade block could really save them from Japanese domination. They are today trying to adopt some of the Japanese management methods and some restrictive and protectionist measures sugar-coated with such terms as "reciprocity", "free-trade", "market economy" and the like themselves. On the other hand, they are pressurizing other countries to open up their markets prematurely. Recent support of the new Clinton administration in the revival of the so-called "Super 301 provisions" for five years, imposition of a weighted average of 26.7% duty on import of some categories of steel and indication of severe restriction on import of automobiles alleged to target Japan have created a new interest in studies about Japan with which the USA had an annual bilateral trade deficit of more than 43 billion US$ in 1992.

The developing countries at different stages of development and with varied natural endowments, which are also finding it difficult to enter Japanese market for a number of reasons, are also seriously interested in understanding things about Japan. Some newly industrialized Southeast Asian countries have recently made substantial progress in understanding and adopting Japanese policies for economic development. This in return has encouraged the other developing countries to take still deeper interest into Japan's development process now. Japan long troubled by a flood of anti-dumping law suits from major trading partners, for the first time, slapped its own ant-dumping duties of 4.5 - 27.2% on the import of Chinese ferroalloy with effect from 3 February 1993. This is a new Japanese strategy, which will also make many countries take an even closer view of Japan.

Research on different aspects of Japan's development has been made from before the War and mostly in retrospective to help answer such questions as: What made Japan grow? Is it possible or advisable to emulate Japanese policies? Are all these really postwar phenomena? Does her present have any corelation with her past? There may be many more simillar questions.

What is visible is largely a postwar development, and this phenomenal postwar economic development of Japan started drawing renewed attention of the developed and the developing countries alike since the early 1960, particularly after Japan was surpassing the advanced European countries one after another, even the UK and

the then West Germany, in GNP to become the second largest economy in 1968 in the free world after the USA, while the developing economy of China and the former USSR used to be shrouded in veil.

These days hardly any country will be found that does not take an interest in Japan for whatever reason it may be. The developed countries are worrying as to how they can compete with Japan. The developing countries are trying to find out whether they can emulate some of Japan's policies and strategies. There came out many best sellers on Japan. Many of them described Japan's development as miracle, some called it a postwar economic phenomenon, while others attributed it to a free ride, US security, and life-long employment. But hardly any research has delved into the factors that made Japan grow to provide answers to both the developed and developing countries.

I have tried to make a deep and systematic study of Japan's development since the Tokugawa era (circa 1603) to find out whether Japan's recent development and strategy have any root there. On analyzing the findings, I have shown that there is nothing miraculous about Japan's economic, industrial, and technological advancement; it is rather a natural outcome of a set of sixteen factors or driving forces, including rational and nationalistic policies, working together in a congenial atmosphere that prevailed or was created in a continuum. The study was presented in my PhD dissertation. The present work is largely based on this dissertation with additional information.

The factors or the driving forces behind Japan's development have been generalized with attempts to establish whether Japan's development process or strategy could be a model for any other country. Japan's present economic status is blamed for economic difficulties faced by many developed countries. It has also been seen how far Japan's strategy could be a problem or a threat to others.

This book is intended to give the readers a deeper understanding of Japan's economic, industrial, and social development along with their underlying mechanism and implications from a historic perspective. This may help the developed countries in fairly dealing with Japan and the developing countries to evaluate the applicability or adaptability of Japan's strategy in their respective cases.

I would like to acknowledge with gratitude all the direct and indirect help or encouragement I have received from different people and organizations in the course of writing this work.

Tokyo, January 1996 *Mustafizur Rahman*

Chapter 1

INTRODUCTION

Some thirty-five years ago Japan's phenomenal economic success aroused unprecedented interest in not only the international business community but also among researchers and scholars of diverse disciplines from both the developed and the Third world countries. Much of the research was however specialized and did not give a complete and comprehensive picture of the country. In order to understand the Japan of today and its development process one should understand its past first to comprehend what factors motivated the Japanese people to achieve so much in such a short time.

Many Southeast Asian countries had the bitter experience of the Japanese military before the end of World War II. Russia did not always find Japan a peaceful neighbour. The USA had the bitterest experience of seeing the Japanese 'Kamikaze' attack on Pearl Harbour. Japan, in turn, saw with deepest hatred the devastation of atom bombs in Hiroshima and Nagasaki in August 1945. It is now more than fifty years since the War has ended. The people of Southeast Asia, Russia, or the USA are not now seriously concerned about Japan's past. Instead, the entire world has focused its attention on Japan for what she has achieved and is doing now, particularly in the fields of economy, industry, and technology.

Today, no signs of devastation exist any more in any parts of Japan except for a few spots specially preserved as tourist attraction and for their historical importance. Well-dressed men and women crowd the well-managed commuter train system in the morning and evening rush hours. Japan boasts of the world's fastest bullet train running nearly every 15 minutes from almost one end to the other of Honshu, the slim main island of Japan. The first railway line was introduced between Tokyo and Yokohama in 1872 with British help.

The two big islands not connected by land so far are now connected by undersea tunnels or bridge systems. The road, highway, and the expressway system, passing through tunnels or overhead, or over the plains throughout this country with about 75% of its area covered by mountains, provide almost a perfect network of transportation facilities suited to this country and within its geographical limitations. Regular ferry services supplement transportation links with the smaller islands. All offices are full of modern, mostly Japanese made equipment.

The use of computers has risen sharply within a very short period. Factories built by the Japanese themselves are operating with a high efficiency rate. Unmanned factories for machine tools are already in operation. Robots are taking over routine hazardous jobs. Japanese cameras, electronic equipment, home appliances, and watches have already made their way to most homes and families in the free world, not to speak of Japan itself. Japanese automobiles and motorcycles are seen almost anywhere. Japan is launching artificial satellites of its own and marketing executive planes to the US. Its arms technology has developed without much fanfare to such a degree that it is being desperately sought after even by the USA. Despite frequent earthquakes, it is no longer avoiding sky-high buildings.

Japan does not encourage internal foreign investment. The openness of the Japanese market is also questionable, but she has been investing heavily in developed and developing countries endowed with natural resources. She can now offer aid to the developing countries to ensure a market for her exports and gradually earn a higher and higher invisible income from the developed countries. The education system has been developed (Appendix 1) and her investment in research and development is at par with other developed countries in its percentage of the Gross National Product (GNP). Medical facilities are extensive (Appendix 2). The average lifespan of the Japanese is now the world's highest. It is improving its public welfare system in phases to catch up with the West (Appendices 3 and 4). Most families have a handsome rate of savings. Its GNP is second only to that of the USA, while it still boasts of the lowest crime rate in the developed world. Japan maintains a healthy, rather enviable trade surplus with almost all non-OPEC countries. Japan is also conscious of its trade interest in China, the CIS, and other former communist block countries. While the unem-

ployment rate is soaring up in the outside world, it is not yet a real threat to Japan despite its very recent recession in some sectors (Appendices 5 through 10).

These visible Japanese achievements after World War II have attracted serious scholarly attention for some time now, but it is only quite recently, particularly since the early 1960's, that a wide section of researchers have begun making fresh efforts into deeper research on the postwar Japanese economic development. Many researchers call it a miracle, while there are opinions to the contrary too. Numerous studies relate postwar-prewar development, but these works leave many questions unanswered as to whether it was simply a miracle or whether Japan followed rational development policies. The question also remains as to whether her present development is only a postwar phenomenon or whether her development policies are adaptable to any other developing countries. The Third world countries aspiring to achieve rapid development are naturally interested in the analyses of the development process of Japan to find a model of development. The developed countries are now wondering what made Japan grow to this level so fast, or would it have to slow down its development stride soon, as most of them had to do? There is agreement on some of these issues and broad disagreement on many others, but data compiled by a number of researchers have now made it possible to conduct an in-depth study of the nature of this book.

A systematic study on the overall economic development process and prospects of its adaptation to other developing countries can lead to a further understanding and find possible answers to these difficult questions.

The adaptability of Japanese economic development process to developing countries has been studied in an environment enormously changed by history and a chain of nonreversible historical events. This did pose some limitations to drawing a direct analogy with various factors of the past, but an attempt has been made to establish their bearings with present economic theories for development.

The purpose of the study and its scope is aimed at finding how Japan achieved such phenomenal economic development surpassing the already developed Western countries; how its history has helped her; how effective her strategies were; how fast Japan introduced technology; and how she could apply all these factors to her economic development. Finally, to see whether Japan's development

process could be adapted to developing countries with altogether different environments.

This study has been extended to cover some of the pre-Meiji era to see whether prewar development was related to the postwar economic development of Japan. Trends in education, industrial activities, agriculture, trade, government policies, overall environment for changes, and a few other social aspects during the later part of the Tokugawa era through the Meiji era have been covered. International environment prevailing at that time was also taken into consideration. The role of government in the development was also studied. For analysis of the development process, the author made use of data wherever applicable. The whole approach was empirical rather than econometric. As statistics alone cannot describe all the aspects of environment under which Japanese development took place, some historical background has been given wherever found relevant.

Chapter 2 reviews works of other researchers in relevant fields related to Japanese economic development. Chapter 3 outlines the postwar economic achievement of Japan and its historical background. Chapter 4 is about the Meiji Restoration, pre-Meiji social background, its relation with Meiji policies, contemporary international pressure, and the influence of Western civilization. Prewar and postwar development processes are also studied and analyzed. The role of prewar governments, their institutions and policy measures are analyzed to determine whether they have contributed to the postwar development. Some statistical comparison (Appendices 11, 12, and 13) with a few Western nations is made wherever found appropriate. However, treatment of this vast subject has been general and limited to broad aggregates.

Chapter 5 brings together the results of the various studies. These have been summed up mainly as the driving forces behind Japan's development, with some explanation for each point to support the findings. In Chapter 6 the development process is modelled around these driving forces. The prospects of the adaptability of this process to some developing countries have been studied by referring to the necessary policies and the present state of affairs in those countries. Whether the Japanese strategy poses a threat to our global economic order is also analyzed in Chapter 7. The environment under which Japan adopted its policy measures has now changed enormously, but attempts have been made to find out the possibility of their adapta-

tion to changed circumstances to derive similar or better results by the developing countries.

Chapter 8 concludes whether Japan's development process is adaptable to any developing economies and whether its strategy will pose a threat to global economic order.

Chapter 2

BACKGROUND OF THE STUDY

The economic development which made Japan's GNP the second highest in the world is sometimes considered to be a post-World War II phenomenon. It is quite often described as a miracle. Many scholars studied the subject recently to find a logical explanation to the Japanese success. In the course of these studies, much valuable pieces of information were gathered. Many different areas of study have been covered in detail. Now reliable data are available for further research and analysis. The present study reviews some important works by other researchers to enable a better understanding of the importance and depth of the study.

REVIEW OF STUDIES ON JAPAN'S ECONOMIC DEVELOPMENT AND RELEVANT ASPECTS

Preliminary studies on Japanese economic history started as early as 1880. Taguchi Ukichi in his *Nihon Kaika Shoshi*[1] points out relation between the human factor and the growth in production, as cited by Mikio Sumiya and Koji Taira, in the following words:

> Progress in the production of goods and services induces the moral progress of the people, for production cannot be sustained without human wisdom and effort. The expansion of production stimulates intellectual growth, which in turn helps production surge ahead.[2]

The book expresses the philosophy symbolizing the motivation of the Japanese during the early Meiji period. Ukichi also published a periodical, *Tokyo Keizai Zasshi*, to propagate his economic

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[1] A Short History of Japanese Civilization. 1982.

[2] Mikio Sumiya and Koji Taira. ed., *An Outline of Japanese Economic History*. 1603-1940 (Tokyo: University of Tokyo Press. 1979), p. 3.

philosophy. Yamaji Aizen in his *Kinsei Busshitsuteki no Shinpo*[3] expresses his belief that social progress is based on economic development. Takekoshi Yosaburo produced a massive eight volume work, *Nihon Keizaishi*,[4] in 1920. Uchida Ginzo discussed the economic condition of Japan's antiquity in his *Nihon Keizaishi*.[5] He extended his coverage to the middle ages and the modern period in his later work. Takimoto Seiichi in his 36-volume *Nihon Keizai Sosho* or *Bibliotheca oeconomiae politicae Japonicae* presented a collection of primary historical materials. The publication of these volumes started in 1924. They were followed by the 54-volume *Nihon Keizai Taiten* or *Magna bibliotheca oeconomiae* published between 1928 and 1930. These are indispensable sources of information on the economic history and philosophy of the Tokugawa era.[6] There are other publications in this line. These works cover the economic history of Japan as a whole upto the present day. These sources were not used in this book as they have been updated and supplemented by many other researchers in their subsequent publications.

Mikio Sumiya and Koji Taira suggest that "a fuller understanding of Japanese research in economic history requires an appreciation of the role that Marxism has played in Japanese intellectual life."[7] This book deals with the historical facts for analysis that can better explain the factors behind Japan's rapid growth rather than the philosophy of Marxism, Confucianism, or bourgeois materialism that transformed Japan from a feudal state into an absolute monarchy. It also provides source and names of a good many research works useful for further study and reference.

Yoshihara Kunio in his *Japanese Economic Development* gives an outline of the course of economic growth in Japan since 1868. This covered a number of selected aspects like trade and development, the Tokugawa heritage, and other similar informative topics.

William Lockwood has attempted to give a quantitative record of achievements and has studied the chief elements of Japan's development process between 1868 and 1938 in his *The Economic Development of Japan* 1954. The writer has further expanded his work by

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[3] *Material Progress in Early Modern Period*, 1892.

[4] *The Economic History of Japan*. 1970.

[5] *The Economic History of Japan*. 1902.

[6] Ibid., p.5.

[7] Sumiya and Taira. op.cit., p.5.

adding an essay on Japan's postwar economic growth titled *Japan's New Capitalism*. Lockwood's work has been a valuable source of information for this study.

Takahashi Masao devoted a chapter on steps leading to the Meiji Restoration in his *Modern Japanese Economy Since the Meiji Restoration* published in 1967. The chapter on formation and development of capitalism gives some information on sources and management of finance for industrialization.

Toyoda Takeshi gives a picture of state of commerce in the pre-Meiji period in his *A History of Pre-Meiji Commerce in Japan, 1969*. He also described the *Tegata* (Promissory note) prevailing in that period, which was an important instrument of trade financing.

Henry Rosovsky in his *Capital Formation in Japan 1868-1940,* published in 1961, gave a quantitative presentation of the government role in capital formation and industrialization. This work presented statistical data, some of which have been used in this study.

G. C. Allen in his *A Short Economic History of Modern Japan*[8] attempted to describe the evolution of the Japanese economy between the time Japan first started westernizing and the beginning of war with China in 1937. He later updated his work incorporating results of subsequent research by various scholars. This study is considered one of the authentic sources of information.

Byron K. Marshall in his *Capitalism and Nationalism in Prewar Japan— The Ideology of the Business Elite, 1868-1941,* has attempted to establish the role of nationalism and ideology of the Japanese business community in the rapid industrialization of the country.

Japanese Industrialization and its Social Consequences, 1976, edited by Hugh Patrick, is quite rich in useful information and analysis offered by a number of researchers on various topics. These sources were made use of in this study.

Japan's development process cannot be understood well without a fair knowledge of the structure of the Japanese financial system and how it is directed. *Japanese Finance* 1981, by Andreas R. Prindl, gives substantial information in this field.

Saburo Okita in his *The Development Economies and Japan: Lessons in Growth* attempted to see whether Japan's experience could be applied in the developing countries with divergent issues

[8] This was originally published in 1946 and was revised and reprinted in 1972 and 1981.

and at diversified stages of development. As to the possibility of learning from Japan, he says:

> Japan is neither an ideal model case nor an utterly useless case for developing countries today; the truth is perhaps somewhere in between.

He also states on the causes of rapid economic growth and confined himself to four broad factors, namely, postwar recovery and reforms, semi-backwardness of economic structure, policies and attitude, and international environment[9]. These are understandable but are not considered to be the only factors; there are many more points or factors behind Japan's economic development.

In *Business Strategies for Japan*, 1970, edited by James C. Abegglen, the common myths like 'cheap labour' growth is the result of export and 'Japanese as copies' are discarded. It is rather argued:

> In sum, Japan's economic success is not a temporary phenomenon. It is not a result of cheap labour, nor of exports, nor of copying. These simplistic explanations cannot explain the massive achievement of Japan. Rather Japanese industrial growth is the result of the functioning of a highly efficient system in which the parts interrelate to stimulate continued growth... Japanese business practices and the business system are far different from those of any Western economy. This has obscured recognition of the near ideal condition that Japan has created for economic growth.[10]

This study accepts the role of cheap labour, export or copying with some qualifications and points out various barriers created by Japan to discourage entry of foreign capital or goods. These observations have shown a good understanding of various Japanese business policies still existing in some form or the other.

Any analysis of modern Japan's economic development always calls for an enquiry into the role of the government, particularly in its fiscal policies. Koichi Emi presented important data on government expenditure and fiscal measures in his *Government Fiscal Activity and Economic Growth in Japan 1868-1960* (Economic Research Series No. 6, 1963).

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[9] Saburo Okita. *The Developing Economies and Japan, Lessons in Growth* (Tokyo: University of Tokyo Press, 1980), pp. 112, 249.

[10] James C. Abegglen, ed., *Business Strategies for Japan* (Tokyo: Sophia University, 1970), pp. 3-4.

The Modern History of Japan by Akio Yasuoka presents brief accounts of major events in the Meiji period and prewar period in a rather simple way. The historical facts are presented well for analysis.

The author's own research work, *Approaches to National Economic and Industrial Planning for the Developing Countries – with Special Reference to the Development Process of Japan* 1978, gives details of the Japanese development process in agriculture, industry, and other social aspects that helped the growth. The prospects of the applicability of the process to a poorly developing country like Bangladesh was explored in some limited fields. The present study has been widened in its scope and more aspects of the development process are covered. The role of the government policies are studied more deeply than before to ascertain its positive contribution to the development. This study would not disagree with the previous findings; rather it would support and strengthen the previous views along with new findings out of the more detailed study into the prewar policies and economic environment.

Chalmers Johnson in his *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925 - 1975, 1982*, tried to unveil the Japanese industrial policy-making process and institutional innovations through rigorous study of the MITI which played and is still playing a pivotal role in the economic progress in Japan. This study is revealing in its findings. Although it covered the period from 1925, the present study made frequent reference to this work. Like Chalmers Johnson, the author discards the miracle view and do not agree with him that the influence of unusual Japanese institutions is "by far the most important" among those which can explain the miracle. However, he agrees that this influence had an important role in Japanese economic development.

The research and publications on different aspects of Japan's economic development or its history have grown so much and so rapidly that it is not practical to review all such works here. Again all of the works are not necessarily analytical. For example, one of the most talked about books on Japan's economy is Ezra Vogel's *Japan as Number One: Lessons for Americans 1979,* but as Chalmers Johnson comments:

> "It is so clearly hortatory about what Americans might learn from Japan rather than analytical about what caused the phenomenal Japanese growth."

Here the author has limited his review to some representative ones only. In the subsequent chapters, references to other works have been made whenever found appropriate to establish his findings, analyses, or conclusions.

This study covers a vast subject, possible only because substantial progress has been made in this field and enough data were available for research on different individual aspects of this topic. Regarding adaptability of Japan's development process to the developing countries, no substantial work has been done for many reasons. A few remarks sometimes made by the researchers from Japan suffer from lack of understanding of non-economical factors of the developing countries. This author has attempted to ascertain the adaptability of the Japanese process to some developing countries under certain conditions and within their own limitations.

Chapter 3

POSTWAR ECONOMIC ACHIEVEMENTS WITH HISTORICAL PERSPECTIVE

ECONOMIC DEVELOPMENT TRENDS IN JAPAN

The economic and social environment of postwar Japan have characteristics not seen in any other country. It was generally believed that Japan was ruined at the World War II and that her chance of recovery, not to mention further development, had disappeared with her defeat in 1945. Most people felt this way until 1960s, and the Western countries showed a ready willingness to accept Japan's exports. The remarkable achievement of Japan by the early 1960's caught most observers by surprise. There were few detailed studies into the causes of or factors behind Japan's success. It is easy to understand why many observers could not describe Japan's postwar development in any term other than miracle.[1] Japan has now established itself as the second biggest economy in the free world. By any standard her achievements were phenomenal, although these cannot be described as a miracle.

Table 3.1 shows that Japan's GNP grew from US$14.2 billion in 1951 to US$22.7 billion in 1955, US$88.8 billion in 1965, US$203.1 billion in 1970, US$44.6 billion in 1973, US$1,039.6 billion in 1980 and to US$2,940.4 billion in 1990. In other words, Japan's GNP in 1965 was 6.25 times its GNP in 1951 and the GNP in 1973 was 29.19 times that in 1951. This growth rate was unprecedented. For example, the GNP of the USA was US$328.4 billion in 1951 and US$1,326.4 billion in 1973 resulting in an increase by 4.03 times, which is no match for Japan's GNP growth during the

[1] Chalmers Johnson, *MITI and The Japanese Miracle: The Growth of Industrial Policy. 1925-1975* Stanford, California: Stanford University Press, 1982, p.3.

corresponding period. Despite the oil crises resulting from repeated price increases of crude oil by OPEC countries since 1973, and despite Japan's huge oil bill, she managed to increase her 1973 GNP 250 % by 1980. This growth under severe worldwide recession is also much larger than the US achievement of a 198% increase during the same period.

Table 3.1. GNP of Japan and of some selected countries, 1951-1993.[a]

Unit: US$ in billion

Year	Japan	USA	Germany FR[b]	UK	France	Italy	Brazil	India	Rep. of Korea
1951	14.2	328.4	28.5	41.4	35.1				
1955	22.7	398.0	43.0	53.9	49.2				
1960	39.1	503.8	70.7	71.9	60.0				
1965	88.8	688.1	115.1	100.2	99.2	62.8			
1967	120.0	790.0	121.0	111.0	109.0	75.1			
1968	164.4	873.4	133.8	105.2	127.6	81.5			
1970	203.1	992.7	185.5	124.0	145.5	100.6			
1973	414.6	1,326.4	344.3	182.0	251.8	154.3	73.0	54.9	12.4
1975	498.2	1,549.2	420.6	234.8	339.7	191.2	–	–	–
1977	686.6	1,918.0	517.1	249.9	384.3	199.3	163.9	100.2	–
1978	963.1	2,156.1	642.6	317.6	476.5	261.7	188.7	117.6	47.6
1979	1,000.9	2,413.9	762.8	409.9	576.1	267.3	204.5	133.6	61.5
1980	1,039.6	2,626.1	823.8	518.6	656.0	396.5	237.4	–	59.2
1981	1,127.0	2,925.5	686.7	516.8	575.5	351.2	–	–	–
1983	1,159.0	3,305.0	656.0	459.0	519.0	352.0	210.0	174.0	79.0
1984	1,257.0	3,775.0	616.0	430.0	488.0	345.0	209.0	188.0	83.0
1985	1,980.0[c]	3,998.0	627.0	459.0	509.0	356.0	–	–	86.0
1987	2,387.0	4,527.0	1,124.0	689.0	877.0	751.0	326.0	224.0	131.0
1989	2,890.0	5,201.0	1,194.0	841.0	956.0	862.0	–	–	–
1990	2,940.4	5,513.8	1,501.2	980.7	1,192.2	1,094.8	510.2	280.3	236.9
1991	3,404.3	–	–	–	–	–	–	–	–
1992	3,778.4[d]	–	–	–	–	–	–	–	–
1993	4,127.5[d]								

Note: [a]US dollar figures are based on annual IMF average Yen exchange rate. [b]Germany F.R. and East Germany were unified in 1990. The 1990 figures also represent GDP for a few countries. [c]1986. [d]Japan's 1991, 1992 and 1993 figures are estimates and converted to US dollar at US$ = ¥134.71 for 1991; ¥125 for 1992 and ¥120 for 1993. The Yen rate however reached US$ = ¥110.25 on April 20,1993.

Sources: Japan Institute for Social and Economic Affairs, *Japan 1981-'93: An International Comparison* (Tokyo: Keizai Koho Center, 1981 - '93); James C. Abegglen, ed., *Business Strategies for Japan* (Tokyo: Sophia University, 1970), 202; Nikkei Weekly, January 25,1993; Kagaku Gijutsucho Keikaku Kyoku, *Indicators of Science & Technology, 1985.*

Japan overtook both France and the UK in GNP by 1967 to become the third largest economy in the free world after the USA and West Germany. She did not remain in the third place for long. She managed to surpass West Germany's GNP in 1968. It is around this period when a number of scholarly studies on various aspects of Japan's economy were undertaken. Many researchers visited Japan and predicted an even brighter future for Japan. Paul A. Samuelson remarked:

> Japan undoubtedly will pass the Soviet Union by (the year) 2000 – less than 30 years away – her per capita GNP may outstrip ours just as we outstripped Britain, the 1800 champ.[2]

This remark confirms a similar earlier comments by Herman Kahn of Hudson Institute: "It's possible for Japan to pass the US in per capita income around 1990 and (with a much smaller population) to equal our total GNP by 2000".[3]

The oil crisis that began in 1973 had an unforeseen impact on the economy of the world and the forecast on the Japanese economy had to be modified slightly, but the fact of Japan's extraordinary performance cannot be denied. Herman Kahn, assessing the postwar economic performance by Japan, said:

> Japan is among the most successful examples of modern economic growth. Between 1948 and 1973 its gross national product (GNP) grew by a factor of about ten in real terms, a figure 2.5 times as high as the world average. Since 1973 the Japanese economy has grown more slowly, but at rates that remain as high as or higher than those of any other affluent country.[4]

It has been proved beyond doubt that Japan has outperformed all the developed and developing countries since the end of World War II. This performance is not limited to its GNP alone. The Japanese people now enjoy a qualitatively better life than those who live in the developed countries of the West. The initial goal of catching up with the West has already materialized. Their second dream of superseding them could also have been achieved by now

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[2] Mustafizur Rahman, *Approaches to National Economic & Industrial Planning for the Developing Countries - with Special Reference to the Development Process of Japan* (Tokyo: Farm Machinery Industrial Research Corp., 1978), p. 7.

[3] Ibid., p. 7.

[4] Herman Kahn and Thomas Pepper. *The Japanese Challenge: the Success and Failure of Economic Success* (Tokyo: Charles E. Tuttle, 1980), p.1.

had it not been for her vast difference with the USA in natural resources.

The following section will examine how Japan achieved so much in such a short time. As the GNP ratings alone do not tell the complete story of the quality of development or the development process itself, inquiry shall hereafter be made into the growth pattern in some typical sectors having greater weight in her economy.

DEVELOPMENT IN MAJOR SECTORS

Japan's postwar development was not only fast but also structurally dynamic. As late as 1955, textiles constituted about 17.5% of her total industrial products, but by 1979 its share was lowered to 4.5%. Chemicals made up 19.1% of the total industrial products in 1955, and it maintained its growth since then to cope with the overall growth. Its share was as high as 14.5% in 1978. Metal had a share of 17.0% in industrial products, and it grew steadily to stabilize at a level as high as 15.4% as of 1978. The extraordinary growth in the industrial sector was brought about mainly by the machinery and equipment sector. Machinery and equipment constituted 14.6 % of the manufactured production in 1955, but its share went up to 33.4% in 1978 (Table 3.2).

Japan's export grew at a rate faster than its rate of growth in GNP. Table 3.2 shows that the surging export was the result of the contribution from these four broad categories of industries, but their individual weight changed between 1955 and 1978. Textiles were the major export in the earlier years. For example, textiles made up for 37.3% of exports in 1955. Its exports continued to rise in value but its share in total exports came down to 4.9% in 1980. Metal was another major export sector. Its share in total exports was 19.2% in 1955. However, it continued to keep pace with the fast growth of exports. Its share was as high as 16.4% in 1980, while it maintained an even higher share in some years in between. The export share of chemicals grew from 4.7% in 1955 to 5.2% in 1980. The most spectacular growth in exports, however, took place in the machinery and equipment sector. While its share in total exports was 12.3% in 1955, the share jumped to 43.6 % in 1968; 64.1% in 1978; and to 75.2% in 1991. The export shares of all industrial manufactures and chemical products have been conspicuously high in Japan's export pattern. This share was 86.2 % in 1953 and 95.7% in 1973.

Table 3.2. Japan's domestic output (value added) and export structures in broad industrial category.

Year	Output % of total value added				Export (US$ million) (figures in parentheses are % of total export)				
	Textile	Metal	Chemicals	Machinery & equipment	Textile	Metal	Chemicals	Machinery & equipment	total
1930	36.5	8.5	15.2	11.6	(52.0)[a]	(8.2)[a]	(4.2)[a]	(7.2)[a]	
1955	17.5	17.0	19.1	14.6	750 (37.3)	39 (19.2)	95 (4.7)	247 (12.3)	2.011
1959	10.3	16.4	21.0	32.2	1.030 (29.8)	401 (11.6)	166 (4.8)	809 (23.4)	3.456
1963					1,247 (22.9)	944 (17.3)	315 (5.8)	1.688 (31.0)	5.452
1965					1,582 (18.7)	1,718 (20.3)	547 (6.5)	2,976 (35.2)	8.452
1967					1,704 (16.3)	1.781 (17.1)	684 (6.6)	4.395 (35.2)	10.442
1968	6.5	14.5	17.1	35.7	1.977 (15.2)	2.347 (18.1)	805 (6.4)	5.656 (43.6)	12.972
1970					2.415 (12.5)	3.806 (19.7)	1,236 (6.4)	8.944 (46.3)	18.969
1973					3,279 (8.9)	6.821 (18.5)	2.147 (5.8)	20.365 (55.1)	36.930
1978	4.5	15.4	14.5	33.4	5.364 (5 5)	15.996 (16.4)	5,072 (5.2)	62.520 (64.1)	95.634
1979					4.908 (4 8)	18.379 (17.8)	6.100 (5.9)	63.182 (61.3)	101.232
1980					6.296 (4.9)	21.319 (16.4)	6.767 (5.2)	81.481 (62.8)	129.807
1981					7.174 (4.7)	22.456 (14.8)	6.841 (4.5)	100.163 (65.9)	152.030
1983					6.613 (4.5)	18.372 (12.5)	6.983 (4.8)	99.560 (67.8)	146.927
1989					6.862 (2.5)	21.577 (7.8)	14.776 (5.4)	205.471 (74.7)	275.175
1990					7.195 (2.5)	19.540 (6.8)	15.872 (5.5)	215.097 75.0)	286.948
1991					7.943 (2.5)	21.126 (6.7)	17.475 (5.6)	236.641 (75 2)	314.525
1992									335.357

[a]Percentage of total export in 1934-36.

Sources: Ministry of International Trade and Industry, *Statistics on Japanese Industries 1969* (Tokyo: Tsusho-Sangyo Chosakai, 1969), pp. 66, 67. Allen, op.cit. pp.259, 271. Nihon Keizai Koho Center. *Japan 1982* through 1993.

Japan exported 30.2% of its total domestic manufactures in 1953, and despite a sharp rise in volume of exports and higher capital formation, she managed to export 41.9% of her industrial products

in 1971.[5] Industrial production constituted 30.8 % in 1968.[6] It can be concluded that it is mainly the development in the manufacturing field that brought about the economic development of Japan. The manufacturing sector of Japan is again quite broad-based and its individual subsectors are interrelated and complementary to each other. The growth in any subsectors had been dependent on the growth of other subsectors or even other sectors of industries. A peculiarity of the industrial growth pattern in Japan was that the growth in one subsector had a dynamic effect on technological development in other sectors or subsectors, and the technological development in one sector brought about structural changes in other related sectors.

In the early postwar period Japanese industries were in dislocation, and in the period leading up to early 1950's they were in a period of rehabilitation. Though many important changes in the social and industrial environment occurred during the first few postwar years, many industries did not have normal production for reasons like change in policies and marketing, technological deficiency, or competitiveness in international market. Some industries did not return to their prewar levels until the mid-or late 1950's. The reasons for dislocation in production were not, however, the direct effects of war in all cases.

Textile industry

Textiles were the major Japanese export in the early years after the end of World War II, but the ratio of export and production changed substantially during the 1950's (Table 3.3). Silk, a major prewar export commodity, lost its importance due to the appearance of nylon in the West. Cotton textiles, another major export in the period before the War, faced trade barriers in the international market. China, the major market in the prewar period, became a communist state which restricted trade with capitalist countries. It was not, however, very difficult for Japan to find a new market in the rich countries. Japan took up production of synthetic fibres like nylon, polyester, acryl and vinylon, in addition to rayon which she had been producing since the prewar time. The ratio of staple rayon

[5] Douglas wilder Morill. "Economic Effects of Japan's Barriers to International Trade and Investment, 1951-1973" PhD diss., Indiana University, 1976, p. 142.

[6] Hugh Patrick, ed., *Japanese Industrialization and its Social Consequences*, (California: University of California), 1976, p. 205.

Table 3.3. Production of major textile items in Japan in selected years (The lower figures in the parentheses represent export volume)

Unit: US$ million

Items	1945	1950	1955	1960	1965	1970	1973	1975	1978	1981	1989	1991
Raw silk	5.2	11	17	18	19	21	19	20	16	15	–	–
			(5)		(0.055)							
Woolen yarn	6.3	33	84	134	155	182	198	142	109	114	–	–
Cotton yarn	24.0	238	419	551	549	526	555	460	448	456	–	–
	(11)		(39)			(8)						
Synthetic fibre yarn	5.8[a]	87[a]	275[a]	358	833	-	-	1,061	1,353	1,369	–	–
	(3)	(9)	(20)[a]	(20)[a]	(28)							
Rayon fabrics	25.0	507	1,396	1,828	1,325	1,181	1,011	630	-	-	–	–
	(164)	(722)	(795)	(576)	(261)	-	-					
Synthetic fabrics	-	-	54	424	1,241	2,746	2,922	2,411	2,916	3,121	–	–
		(4)[b]	(65)	(419)	(1,339)	-		(1,587)[c]				
Woolen fabrics	-	-	-	-	350	-	-	357	336	291	–	–
Cotton fabrics	46.0	1,289	2,524	3,222	3,013	2,616	2,380	2,124	2,315	2,066	–	–
	(922)	(952)	(1,191)	(1,008)	(428)	(246)						
Textile (total export) FOB			750	–	1,582	2,415	3,279	–	5,364	7,174	6,862	7,943

[a]Rayon products only. [b]1956. [c]1979.

Sources: Ministry of International Trade and Industry, *Statistics on Japanese Industries 1969* (Tokyo: Tsusho-Sangyo Chosakai, 1969), pp. 52, 53. Ministry of Foreign Affairs, *Statistical Survey of Japan's Economy, 1971* (Tokyo: Ministry of Foreign Affairs, 1971), pp. 21, 49. Economic & Foreign Affairs Research Association, *Statistical Survey of Japan's Economy, 1978* (Tokyo: The Keizai Gaiko Kenkyukai, 1978), p. 21; Nihon Keizai Shimbun, *Industrial Review of Japan/1979* (Tokyo: Nihon Keizai Shimbun, 1979), pp. 152, 156, 1982. G.C. Allen, *A Short Economic History of Japan*, fourth ed. (London: The Macmillan Press, 1981), P. 260, 263-264.

to filament started increasing as of 1950. By 1955, spun rayon fabrics exceeded filament rayon fabrics in production volume. Starting with a production of 3 million square metres in 1951, synthetic fabrics increased in production volume to 2,746 million square metres compared to 2,616 million square metres of cotton fabrics in 1970. The volume of export of synthetic fabrics rose to 1,587 million square metres in 1979.[7] A number of newcomers from the developing countries entered the textile field quite early in the postwar period. But despite increased competition in general textiles, she managed to maintain her competitiveness in quality products by technological innovation and improvement. Textiles supported her industries when that support was necessary in the difficult period. She is, however, no longer relying on export of textiles as a foreign exchange earner in the later years. Textiles was one of the difficult sectors of industry that taught Japan many lessons in industrial restructuring in the early postwar period.

Metal industry

Iron and steel industries were the supporting as well as guiding industries for all other heavy and light industries of Japan. Metal industries as a whole had been the second largest foreign exchange earners immediately after the War. They are still playing a big role in the Japanese economy and in international trade. These industries supported machinery industries to grow with the surging demand of heavy and light industrial products in the international market in the early postwar period onward. Japan, although not rich in natural resources, had exploited some of her own iron ore copper ore zinc ore, coal, natural gas, crude oil, lead ore, sulphide, tin, antimony, mercury, manganese dioxide, manganese, and chromium ore, tungsten, molybdenum and titanium to supplement her rising consumption. In addition, Japan had some gold and silver deposits. Japan mined 7,868 kg gold in 1967, 7,418 kg in 1968, 7,606 kg in 1967, and 7,937 kg in 1970. She mined 336 metric tons of silver in 1967, 332 metric tons in 1968, 336 metric tons in 1969, and 343 metric tons in 1970. Japan had operated 38 gold and silver mines in 1967. The number of such mines was 41 in 1969 and 32 in 1970.[8]

[7] G. C. Allen. *A Short Economic History of Modern Japan*. fourth ed. (London: The Macmillan Press. 1981). p. 264.

[8] World Economic Information Services. *Economic Information file Japan* (Tokyo: WEIS. 1972). p 195.

The domestic resources constitute a very small part of her total consumption now, but in the early postwar period their contribution to the economy was not negligible.

Although still under the rule of the Allied forces, the government of Japan took protective and supporting measures for these industries. Pig iron production which fell in 1945 to 977,000 metric tons from its prewar level of 6,095,000 metric tons started picking up.[9] It went up to 2,233,000 tons in 1950; 5,217,000 tons in 1955; 11,896,000 tons in 1960; 27,502,000 tons in 1965, 68,048,000 tons in 1970, and 90,007,000 tons in 1973. The rise was not so smooth after this. The annual output of ordinary steel, which was 4,961,000 tons in 1939, fell to 898,000 tons in 1945, but it went up to 3,486,000 tons in 1950; 6,930,000 tons in 1955; 16,051,000 tons in 1960; 23,307,000 tons in 1963; 30,972,000 tons in 1965; 68,552,000 tons in 1970; and 92,574,000 tons in 1973. Production fluctuated after 1973 due to higher production in special steel and global recession following the first oil crisis in 1973 (Table 3.4a & b).

Mining industry and energy sector

Copper ore output in postwar Japan had increased from 29,000 tons in 1945, in terms of content of copper in the ore, to 39,000 tons in 1950; 73,000 tons in 1955; 89,000 tons in 1960; and 120,000 tons in 1968. In subsequent years, however, the domestic production did not increase for rise in production cost compared to imported ore easily available from different sources all over the world. This dependency on import of this ore was just 8.5% of her consumption in 1955. The dependency, however, increased to 96.9% in 1975 due to increase in demand.

Coal had been an important mineral resource of Japan that helped her in maintaining industrial development during the prewar and early postwar periods. It contributed to high growth in steel industries even at her difficult time. Japan's coal production was 30 million metric tons in 1945, but it was raised to 38.5 million tons in 1950; 42.4 million tons in 1955; 51.1 million tons in 1960; and 52.1 million tons in 1963. Production did not, however, increase further as cheaper coal was available abroad and change in consumption pattern as a source of energy. Even then, Japan did not abandon coal

[9] Takahashi Masao. *Modern Japanese Economy since the Meiji Restoration*. Series on Japanese Life and Culture, Vol. XIV (Tokyo: Kokusai Bunka Shinkokai, 1967), p. 74.

production. She produced 18.4 million metric tons of coal in 1976; 18.2 million tons in 1977; 19.0 million tons in 1978, and 17.6 million tons in 1979. In order to prevent a complete switchover to other fuel or energy sources, particularly after the oil crisis in 1973, she maintained her level of coal use by importing coal as necessary. The import volume was 60.8 million tons, valued at US$3,560.3 million in 1976; 52.2 million tons in 1978, valued at US$3,076.9 million, and similar quantities in other years around this period.[10] This import also opened her opportunity for investing in mining abroad.

Japan did not have much crude petroleum or natural gas to meet her energy demands. She had thoroughly explored her land and sea for oil and gas, but her production did not rise dramatically. Her discovered deposits of crude oil were estimated at 10.14 million tons as of 1970. The discovered deposits of natural gas were estimated at 21,580 million cubic metres as of 1970.[11] However small the deposits she might have discovered, she tried to expand production. The crude oil production, which was 245,000kl in 1945, went up gradually to 399,000kl in 1970. Natural gas production was 1,695 million cubic metres in 1965, and went up to 2,359 million cubic metres in 1975.

As the economy expanded, the demand for natural resources for manufacturing industrial products for domestic consumption and export increased sharply. As a result, her dependence on the import of natural resources increased. Table 3.4a shows the gradual increase in Japan's dependence on the import of basic raw materials. The volume of output of important minerals and the import of raw materials for metal industries are also shown. Table 3.4a further shows that Japan imported ores and scraps of different metals to turn out metal products for domestic consumption as well as for export to finance the import of raw materials. The rate of growth in the production demonstrates what importance Japan gave to this sector of industry. To ensure future supplies of important natural resources at reasonable rates, Japan has recently invested heavily in countries like Australia, Indonesia, Brazil, and a number of other countries endowed with natural resources. Japan is now doing research to produce new materials ahead of others to gain a lead in the market,

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[10] Hideo Tamura, "Coal: Collieries Move Overseas to Develop and import Steaming Coal", *Industrial Review of Japan/1980*, p. 60.

[11] World Economic Information Services, op. cit., p. 190.

Table 3.4a. Japan's output of major metals and domestic mining products, their export, import of raw materials for them and dependency on import in selected years.

Items	1936	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1991
Metal products												
Export (US$M)						1,718	–	12.518	21,319	18,491	19,540	21.126
Ore/scrap import (US$M)						1,019	–	4,417	8,430	6,232	9,119	8.777
Fuel import (US$M)						1,626	3.905	25.641	69,991	55,895	56,732	54,756
Iron & steel												
Export ('000 mt)	489	–	–	1,989	2,313	9,664	17.539	–	29,705	33.342	17,021	–
Export (US$M)						1,290	2.844	10.176	15.454	19,719	12,509	13.612
Output												
Pig iron ('000 mt)	2.008	977	2.233	5,217	11,896	27,502	68,048	86.877	87,041	80,569	80,229	–
Crude steel ('000 mt)		1.963	4,839	9.408	22,138	41,161	93.322	102,313	111,395	105,279	110,339	109,636
Hot rolled steel ('000 mt)												
Non-ferrous metal output ('000 mt)												
Ordinary		898	3.486	6.932	16,051	30,972	68,552	77,879	88,888	81,429	87,703	–
Special		256	70	294	1,296	2,412	7,381	7,955	12,872	16,802	16,311	–
Copper												
Rolled/extruded		60	78	117	268	312	549	523	1.014	–	1.008	1.076
Copper, cable/wire			60	95	233	372	661	654	904	944	1,155	–
Aluminium		16	25	58	133	294	733	1.013	1,091	231	51	–
Lead							209	194	221	285	261	–
Zinc							676	702	735	740	687	–
Nickel							13	13	25	23	–	–
Electrolytic gold (mt)							22	33	38	43	108	–
Electrolytic silver (mt)							920	995	1,177	1,643	2,089	2.143

(Contd.)

Table 3.4a *(Continued)*

Items	1936	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1991
Mining output												
Iron ore[a] ('000 mt)		1.635	826	987	1.290	1.119	862	602	477	338	34	–
Import dependency (%)				(84.2)	(92.1)	(97.2)	(99.2)	(99.6)	(98.7)			
Copper[b] ('000 mt)		29	39	73	89	107	120	85	53	43	13	–
Import dependency (%)				(8.5)	(53.6)	(84.5)	(93.0)	(96.9)	(96.0)			
Zinc[b] ('000 mt)		31	52	109	157	221	280	254	238	253	127	–
Import dependency (%)							(55.0)		(68.5)			
Coal output		30,000	38,500	42,400	51.100	49,534	39,700	18,999	18.027	16,383	8,263	–
('000 mt)				(25.9)	(39.4)	(56.3)	(79.9)	(76.6)	(81.8)			
Import dependency (%)												
Crude Petroleum		245	328	354	593	751	899	705	503	625	632	–
output ('000kl)				(96.0)	(98.1)	(99.1)	(99.5)	(99.7)				
Import dependency (%)												
Natural gas (m^3 million)						1.780	2,359	2,436	2.197	2,225	2,044	–
Import dependency (%)									(90.7)			

[a]Concentrates. [b]Metallic content in concentrates.

Sources: Nihon Keizai Shimbun. *Industrial Review of Japan*, Tokyo: Nihon Keizai Shimbun, 1979, p. 150; *Industrial Review of Japan/1982*, p. 154; Ministry of International Trade and Industry. *Statistics on Japanese Industries. 1969* (Tokyo: Tsusho Sangyo Chosakai, 1969), pp. 67, 68; World Economic Information Services. *Economic Information file Japan 1972* (Tokyo WEIS, 1972), pp. 185-199; G.C. Allen, *A short economic history of Modern Japan*, fourth ed. (London: The Macmillan Press, 1981), p. 265; Keizai Koho Center. *Japan 1980. An International Comparison* (Tokyo: Keizai Koho Center, 1980), p. 14; *Japan 1982*. Ministry of Foreign Affairs, 1972), pp. 21, 23, 49, 51; (1978), 21, 23, 49, 51. The Nikkei Weakly, May 23, 1992; Statistical Bureau, Management and Coordination Agency, *Japan Statistical Yearbook 1992*.

as she did in the last few decades. Volcanoes and hundreds of hot springs in Japan speak for the feasibility of exploiting geothermal energy. Now technology has developed in this field, and Japan has already started quite a few geothermal electricity generating facilities over the last few years.

Japan's mountainous terrain provided her hydro-electricity potential which she exploited. Her hydro-electric generation in 1976 was equivalent to 15.11 million metric tons of coal. Some pilot plants and commercial plants to exploit sea wave energy, solar energy, biomass energy, and wind energy are being completed one after another. Commercial scale fuel-cell plants are now being put into operation. Japan has achieved an energy savings target higher than any other developed country while still expanding her growth. This saving coupled with the development of alternative energy has also helped her economy absorb some of the effects of the steep rise of oil prices since 1973. Japan's technology is now clearly an asset more valuable than the natural resources of many developed or developing countries even in the field of energy which is Japan's biggest weakness.

Japan's import of mineral fuel, including coal, gas, crude petroleum, and nuclear fuels cost her US$ 1,211 million in 1963; 2,675 million in 1968; 8,327 million in 1973; 25,641 million in 1975, and 72,563 million in 1981. Her dependence on the import of crude oil was 96.0% in 1955; 98.1% in 1960; 99.1% in 1965 and 99.7% in 1975. Japan's dependence on the import of coal was, however, quite low at 25.9% in 1955; 39.4 % 1960; 56.3% in 1965, and 76.6% in 1975 compared to her overall dependence on imported natural resources. She imported metal ores and scraps for US$ 1,019 million in 1965; 4,417 million in 1975 and 7,284 million in 1981. Despite heavy import of raw materials for metal industries, the metal industries earned her foreign exchange far exceeding her import bill for the raw materials for them. It would probably be impossible for Japan to build an industrial and physical infrastructure for her growing economy without the support of metal industries.

Japan has always had an energy policy based on the principle of ensuring supply from diversified sources and security against interruption due to external crises. The oil crisis in 1973 onwards and the Gulf war in 1991 strengthened her policy further towards stockpiling for longer periods (about 120 days' consumption). Despite the bitter experience of having atom bombs dropped on her

territory and legal restrictions to possessing nuclear weapons, Japan raised the proportion of nuclear energy to 23.8% of her total electricity generation of 850,743 GWh (as of 1990) with her 41 reactors. Table 3.4b shows the breakdown of electricity generation in Japan according to energy sources. She has managed to start her own nuclear fuel reprocessing plant to reduce her dependence on the USA, France, or the UK.

Although the recent accidents in Three Mile Island nuclear plant (at the end of March 1979) in the USA and Chernobyl nuclear plants in Ukraine (in 1986) of the then USSR caused a review of nuclear programmes in many countries, Japan is determined to go ahead with Fast Breeder Reactor development to produce nuclear energy that produces more nuclear materials than it consumes. Japan wants to minimize her weakness in the energy sector even at a higher cost, with an eye to future development. Japan is hoping to earn from the technology involved. The immediate prospect is for an approximately US$24 billion jobs of improving the safety of the former Soviet Union member countries' nuclear power plants and recovering nuclear fuels from the nuclear warheads that are likely to be destroyed under the US-USSR treaty.

Table 3.4b. Electricity generation in Japan by sources of energy in selected years.

Year	Total electricity generated (GW h)	Thermal				Nuclear %	Hydro, geothermal & solar %
		Total %	Solid fuels %	Petro product %	Gas %		
1965	188,377	62.39	–	–	–	0.01	37.6
1974	459,041	77.00	7.8	65.3	3.9	4.30	18.5
1980	572,531	70.00	8.7	47.1	14.2	14.40	15.6
1987	710,867	63.20	15.2	28.3	19.7	26.40	10.4
1988	745,228	64.10	15.0	29.5	19.6	24.00	11.9
1989	791,168	65.40	14.7	32.0	18.7	23.10	11.5
1990	850,743	65.50	14.3	32.2	19.0	23.80	10.7
1992	748,326	–	–	–	–	–	–

Note: GW.h stands for Giga watt.hour (billion watt.hour or million Kwh). The installed capacity was 33,063 MW in 1963; 40,928MW in 1965.

Sources: Keizai Koho Center. *Japan* 1980-1993.

Japan has recently built a special ship to transport her nuclear fuel and radioactive material safely. It has already transported a

large quantity of reprocessed nuclear fuel from Europe. The present large stockpile of nuclear fuel and plutonium in Japan coupled with her technology and reprocessing plants shall make her somewhat more comfortable in a short-lived energy crisis.

Chemical industry

The chemical industries had played an important role in Japan's economy from the prewar period. Earlier, emphasis was given to paper, cement, sulphuric acid, soda, ammonium sulphate, and other essential bulk production industries. From the early postwar period, efforts were made to increase production in these industries while heavy investments were made in other petrochemical industries to produce such petrochemical products as polyvinyl chloride, polypropylene, polyethylene, synthetic rubber, and many other derivatives new to Japan. As has been the case with other industries, the rate of increase in production was also very broad-based. The production was not limited to items mentioned above only; the list of products included everything from carbon black, paints, synthetic dyes and so on to synthetic fibres, pharmaceuticals and even the biotechnological products in the more recent years. Only a few major items shall be discussed here for the purpose of studying the general trends in growth and development.

Table 3.5 shows that Japan's paper and paperboard production was already 2,204,000 tons in 1955. The production volume rose to 4,513,000 metric tons in 1960; 7,299,000 metric tons in 1965; 12,973,000 metric tons in 1970; and 18,090,000 metric tons in 1980. Japan does not have extensive forest resources for pulp but she exported paper and paperboard so as to earn foreign exchange to enable the import of raw materials. Japan now ranks second after the USA in the annual production of paper and paperboard as of 1980.[12] Paper industries cause pollution. When Japan wanted to control pollution and no longer had any foreign exchange problem, she encouraged the paper industries to invest in overseas production ventures close to sources of raw materials. Japan's Jujo Paper entered into a joint venture with Weyerhaeuser Co. at Longview, Washington. Their annual capacity for newsprint was about 210,000 tons by 1982. Jujo was expected to import 50 % of the output from the venture. They were also expected to build a similar plant in

[12] Masaichi Hirogami, "Pulp and Paper", *Industrial Review of Japan*, 1982, p. 114.

Table 3.5. Output of a few major chemicals and chemical products in Japan in some selected years.

Unit: million ton

Items	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1992
Paper & paperboard	-	-	2.204	4.513	7.299	12.973	13.601	18.090	20,469	28,086	28,322
Cement	1.177	4.462	10.563	22.537	32.689	57.189	65.520	87,958	7.9578	84,445	-
Sheet glass	0.018	0.170	0.299	0.559	0.682	1.136	1.102	-	-	-	-
Sulphuric acid	0.424	2.030	3.290	4.452	5.655	6.925	6.000	6,777	6,600[a]	6.887	-
Caustic soda	0.057	0.195	0.517	0.869	1.344	2.685	2.948	3,157	3,074	3,917	3,866
Sodaash	0.047	0.165	0.330	0.519	0.766	1.237	1,124	1,355	1,057	1,135	-
Ammonium sulphate	0.243	1.502	2.129	2.423	2.489	2.419	2.125	1.878	1,837	1,803	-
Urea resin	0.001	0.006	0.040	0.128	0.249	0.536	0.485	-	-	-	-
Polyvinyl chloride	0.001	0.032	0.258	0.483	1.161	1,121	1,429	1.550	2,049	-	
Ethylene			-	-	0.770	3,049	-	-	3.685[a]	5.810	6.103
Polyethylene			-	-	0.396	-	1.129	1,860	-	2,888	2.980
Polypropylene			-	-	-	0.581	0.594	927	1,062[a]	1,942	2,038
Synthetic rubber			-	-	0.161	-	0.789	1,094	1,158	1,426	-
Polystyrene			-	-	-	-	-	0.640[b]	0.663[a]	2,092	2.005
Toluene								0.962[b]	0.856[a]	-	-
Benzene								2.179[b]	1.938[a]	-	-
Xylene								1.318[b]	1,271[a]	-	-

[a]1983. [b]1979.

Sources: *Industrial Review of Japan*, 1982, pp. 155-56, 112, 114; (1980), pp. 106-07; World Economic Information Services, *Economic Information File Japan* (Tokyo: WEIS, 1972), pp. 80. 92; Ministry of Foreign Affairs, *Statistical Survey of Japan's Economy*, 1971, p. 21; (1978), p. 21; *The Nikkei Weekly*, May 23, 1992; March 22, 1993.

the next three years.[13] Daishowa was trying for a joint venture in Canada while some other paper makers were trying for joint ventures in Brazil and the other countries. Japan could thus maintain her high volume of production while avoiding some expenditure on pollution control (Appendix 13).

Cement was an essential material for construction and reconstruction of factories, physical infrastructures, and housing immediately after the War. After the process of re-building was complete, cement was still necessary for development work in all other sectors. Japan had already a long history of cement production. The production volume of cement was 1.177 million metric tons in 1945. The production volume sharply rose to 4.462 million metric tons in 1950; 10.563 million metric tons in 1955; 32.689 million metric tons in 1965; and to 87.958 million tons in 1980 (Table 3.5). The industries not only met the high domestic demand but also earned her a substantial amount of foreign exchange. Japan exported 2.090 million tons of cement in 1970; 2.150 million tons in 1971; 4.420 million tons in 1975; 7.060 million tons in 1977; and 9.070 million tons in 1978.[14] This is one of those few industries which can greatly use Japan's own raw materials. Japan rightly developed it with care.

Glass was important not only for housing and construction but also for the automobile industries. The production volume increased to 0.170 million metric tons in 1950; 0.299 million metric tons in 1955; 0.559 million metric tons in 1960; and 1.136 million metric tons in 1970. It further rose to meet the expanding demand resulting from expansion in automobile industries and changes towards luxurious housing. Japan has now the world's third largest sheet glass production capacity, next to the USA and the Soviet Union (as of 1981). As domestic production may not increase further, the Japanese industries have already started their production in some developing countries. Japan had been looking for their foothold in the profitable market of the Western countries. In 1981, Asahi Glass acquired the management rights of Glaverbel SA, one of the leading enterprises of Belgium, and Machinate Glasfabriek de Maas BV in Holland.[15]

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[13] Nagisa Kamiyoshi. "Pulp and Paper". *Industrial Review of Japan*. 1979. pp. 115. 143.

[14] Yoichi Yazawa. "Glass & Cement". *Industrial Review of Japan*. 1980. p. 126.

[15] Kiyoshi Hasegawa and Yoshihiko Shimizu. "Glass & Cement", *Industrial Review of Japan*. 1982. pp. 134-135.

Both the cement and glass industries improved their technology to conserve energy in order to be competitive. The housing sheet-glass making was modernised and changed to the floating process developed by Britain's Pilkington Brothers Ltd.[16] Cement manufacturers resorted to installing energy-saving kilns equipped with new suspension preheaters developed in Japan. The recycling of waste energy and rapid promotion of the use of coal finally saved a big 20.9% in energy consumption per ton of cement produced in 1980 compared to the consumption in 1973.[17]

Sulphuric acid, caustic soda, soda ash, and ammonium sulphate industries were quite developed long before the War. Because of their importance for the expansion of other chemical industries, the production of these basic chemicals expanded sharply immediately after the War.

Table 3.5 also shows the volume of production of sulphuric acid. It was 0.424 million metric tons in 1945, but the volume increased to 2.03 million metric tons in 1950; 3.29 million metric tons in 1955; 4.452 million metric tons in 1960; and 6.925 million tons in 1970. Caustic soda production was 0.057 million tons in 1945, but it expanded to 1.344 million metric tons in 1965 and to 2.685 million metric tons in 1970. Due to pollution caused by mercury in the electrolysis process, the government decided to abandon the project and switch over to the diaphragm process over a specified number of years. Asahi glass installed Diamond Shamrock Corporation's diaphragm process facilities in 1974 with a production capacity of 1,300 metric tons per month. A few other manufacturers introduced the technology from other American companies, such as PPG Industries Inc. and Hooker Chemical Corporation. Three other Japanese manufacturers—Kureha Chemical Industry Co., Showa Denko K.K. and Nippon Soda Co., developed a diaphragm process of their own. Meanwhile, Asahi Chemical Industry Co. perfected a completely new process using an ion exchange membrane. While Japanese manufacturers were busy in conversion to the diaphragm process, Dow Chemical of the USA sought permission to start a large production plant in Japan. The original plan could not, however, mate-

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[16] Akira Shimada and Toshihisa Komaki. "Glass & Cement: Glass makers switch to floating technology for simplicity and cost down; Cement does poorly", *Industrial Review of Japan*. 1975. pp. 108-09.

[17] Junji Sagara, "Energy conservation". *Industrial Review of Japan*, 1982. p. 46.

rialize due to objections raised by local producers to the government.[18] One may wonder why Japan did not purchase the cheap caustic soda from abroad. Japan's basic policy of avoiding dependency on foreign industrial products and protecting local markets may be the answer. Japan's policy served its purpose; now Japan is exporting caustic soda plants with domestically developed processes while local manufacturers are also protected. Soda ash production also followed the trend of caustic soda in rapid expansion.

For an increase in agricultural production, Japan had huge fertilizer production facilities from before the War. The production of ammonium sulphate in 1945 was 0.243 million metric tons, but it jumped to 1.502 million metric tons in 1950; 2.129 million metric tons in 1955; and 2.489 million metric tons in 1965. Japan had an overcapacity by the early 1970's, and the industries sometimes suffered from excess production. But, in 1973 and 1974, demand for fertilizer in the international market increased and the price went up sharply. Japan's fertilizer industry earned a large amount of foreign exchange during that boom period.[19] Japan also applied her fertilizer production technology to export of plants abroad.

As a result of World War II Japan's chemical technology was outstripped by that of the advanced Western countries. This is specially visible in the field of petrochemical industries. Adoption of advanced technology was initially limited to Mitsui Toatsu Chemical's (previously called Toyo Koatsu) Vinylon, Japan Catalytic Chemical Industry Company's EO and EG, Mitsubishi Petrochemical's Octonol and so on. Advanced techniques from foreign countries were consequently imported year by year. The import of technology, investment in plants, and expansion of production in the field of petrochemicals were very fast and massive to overcome the deficiency of a late start in the mid-1950. It is said:

> In 1956, the first year of the initial planning stage for the industrialization of petrochemicals, there were 46 such items (technology) imported, in 1960, when the second planning stage began, there were more than 100 cases of imported know-how for each successive year. From 1965... Japan's own petrochemical industry was established, original Japanese technology became

[18] Toyohiko Kobayashi and Akiyoshi Abe, "Chemicals", *Industrial Review of Japan*, 1975, pp. 98, 99.

[19] Kobayashi and Abe, op. cit., pp. 98, 99.

adapted to industry and these techniques have recently been aggressively exported.[20]

The production of various petrochemicals grew smoothly in the 1960's. Production of urea resin was 1,000 metric tons in 1945, but its volume went up to 0.536 million metric tons in 1970. Ethylene production was 0.770 million metric tons in 1965, but its volume rose to 4.364 million metric tons in 1978, and 3.647 million metric tons in 1981. Annual polyvinyl chloride production was just about 1,000 metric tons in 1950, but its volume rose to 1.429 million metric tons in 1980. The production volume of polyethylene, polypropylene, synthetic rubber, and various other derivatives followed a similar rising pattern to meet fast growing domestic requirement and export demand in the 1960's and early 1970's. Japan sometimes suffered from overproduction in some years of recession, but she resorted to a production cartel to keep the domestic industries economically healthy. In order to protect the local market from foreign products, Japanese companies blocked the major competitors in the USA, Europe, and Mexico by making sole agency agreements with them for the distribution of their products throughout the world. Mitsubishi Corporation signed a pact with Diamond Shamrock Corporation to distribute the US firm's vinyl chloride monomer (VCM) on an exclusive basis throughout the world except the USA. Their 10-year agreement stipulates that the annual volume be set every year, but the trader was trying to sell 200,000 tons annually in the initial years.

Mitsubishi also signed an acrylonitrile agreement with Monsanto Company of the USA. Mitsui & Co. finalized VCM pacts with both Rhone Poulenc SA of France and Akzo Zout Chemie of Holland so that it can distribute the raw materials of PVC in Southeast Asia. Mitsui also reached agreements with two Mexican producers of purified terephthalic acid about marketing the raw material of polyester fibres. Meanwhile, Sumitomo Corporation reached an agreement in principle with Georgia-Pacific Corporation of Portland, Oregon, a major paper, pulp and housing material producer, about handling sales of its synthetic resins used for plywood adhesives. Sumitomo also planned to sell VCM, caustic soda, and chlorine.[21] The third country trading system gave Japan a profit, control over the world market, and protection of her local petrochemical industries.

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[20] World Economic Information Services, op. cit., p. 96.

[21] Shota Ushio, "Petrochemicals", *Industrial Review of Japan*, 1980, pp. 102-03, 107.

Technical improvement and technological progress in developing better engineering plastics for electrical appliances, automobile parts, and other engineering application also helped this sector in maintaining higher production. This is a vital sector of Japanese industry, and Japan is capable of developing as well as maintaining it almost unaffected by international competition.

Pharmaceutical industry

Japan's pharmaceutical industries sector was one of the fastest growing in postwar Japan. However, it did not develop on its own technology. Historically, the Japanese pharmaceutical industry developed initially on a foreign technological base. The industry's topmaker, Takeda Chemical Industries Ltd, and other major producers were originally drug wholesalers. They used to market imports and gradually diversified to manufacturing. Still, they merely formulated the imported bulk drugs before World War II.[22] It is only after the War that various companies entered into different phases of synthesis of drugs and their marketing. The first products that helped the industry were vitamins. Vitamins made and marketed by Takeda and Chugai pharmaceutical Co., among others, met the local demand in the last half of the 1950's. By the last half of 1960s, the vitamin boom ended. The pharmaceutical companies then consciously tried to develop and manufacture drugs. They started investing in research and development. Japan's experience in 'Sake' brewing helped her in antibiotics development. Her antibiotics occupied a share of 22.9% of its total pharmaceutical production as of 1978.

Japan's investment in this field was also quite high. Japan's existing facilities in 1969 were valued at ¥157,000 million (US$436.1 million) after deductions for depreciation. In the fiscal year 1969, the pharmaceutical industry invested a total of ¥49,000 million (US$137.7 million) in new plant equipment. This investment was 57.8% higher than her previous year's investment.[23] The massive investment in plants, research and development, and imported know-how put Japan's pharmaceutical industry on a sound footing. Japan's export of pharmaceuticals was already ¥37,000 million (US$104.7 million) in 1970. Though all the big international

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[22] Naomi Mochizuki, "Pharmaceuticals", *Industrial Review of Japan, 1980*, pp. 106-07.

[23] World Economic Information Services, op. cit., p. 104.

pharmaceutical companies were operating in Japan mostly in joint ventures, the Japanese patent law also helped her industries in getting patents by making minor changes in the established medicines.[24] This law was, however, revised to make it more stringent. As Japanese pharmaceutical industries grew fast making high profits, they could also invest heavily in research and development. The growth was amazingly fast. Table 3.6 shows the pharmaceutical production at US$280 million in 1956, but it grew to

Table 3.6. Output of pharmaceuticals in Japan in selected years.

Unit: US$ million

Year	Output	Growth rate[a] (%)	Year	Output	Growth rate[a] (%)
1956	288.0	16	1974	5,819.0	24.0
1957	345.5	21	1975	6,039.2	5.0
1958	373.3	7	–	–	–
1959	414.4	11	1976	7,291.5	20.0
1960	488.9	18	1977	9,155.0	14.0
			1978	13,276.0	14.0
1961	605.6	24	1979	13,882.9	8.9
1962	737.5	22	1980	15,356.9	14.5
1963	947.5	28	–	–	–
1964	1,175.6	24	1981	16,682.4	5.7
1965	1,271.1	8	1982	15,979.7	8.2
			1983	16,976.4	1.3
1966	1,408.6	11	1984	16,954.3	–0.1
1967	1,564.4	11	1985	16,776.3	–0.6
1968	1,913.6	22	–	–	–
1969	2,340.3	22	1986	25,401.9	7.0
1970	2,848.1	22	1987	33,361.4	12.7
			1988	39,480.8	4.9
1971	3,031.2	3	1989	39,883.1	8.8
1972	3,601.7	3	1990	38,645.2	1.7
1973	5,040.6	25			

Note: Dollar values are calculated from Japanese yen values of respective years at the exchange rate given in IMF, *International Financial Statistics*. These rates are given in appendix 14.[a] The growth rate marked is based on Japanese yen value.
Major drug companies in Europe and the USA spend around 15% of their sales on R&D. In Japan the figure is just rising above 10%. It was about ¥8 billion in 1980 and it is now nearing ¥20 billion as of 1990. *The Nikkei Weekly*, May 23,1992.

Sources: Naomi Mochizuki, "Pharmaceuticals", *Industrial Review of Japan/1980* (Nihon Keizai Shimbun, 1980), Tokyo p. 107; Masatomi Kasagi, "Pharmaceuticals", *Industrial Review of Japan*, 1982, P. 112; Japan Institute for Social and Economic Affairs, *Japan 1981*, Keizai Koho Center, Tokyo 1981, p. 39; Japan Pharmaceutical Association, *Yakuji Kogyo Seisan Dotai Tokei Nenpo*, June, 1991.

[24] Shunichi Ishigami, "Pharmaceuticals", *Industrial Review of Japan*, 1975, pp. 100-1.

US$15,357 million in 1981 and US$38,645.2 million in 1990. Japan's pharmaceutical products were once considered to be far inferior to their Western counterparts and to be imitations of the established products of the West. But recent licensing by Japanese developers to foreign firms proves their quality. For instance, Toyama Chemical Co. licensed its Cephalosporin know-how to Pfizer Inc., Shionogi & Co. to Eli Lilly & Co., Fujisawa Pharmaceutical Co. to Smith Kline Corporation, and Kyorin Pharmaceutical Co. to Merck & Co.[25] Japan's technological development is also manifested from comments (in 1982) by the giant international manufacturers operating in Japan as:

> Only 10 years ago, 95% of all Japanese drugs were originally developed overseas. Now... 40% of the drugs in Japan are developed by the Japanese—some of them good enough to warrant international fame.[26]

Japan is now investing heavily in biotechnological products and cancer drug development. The future might prove how far their achievement shall reach compared to the achievement by the West in these fields in which they are leading so far.

Machinery and equipment industry

As of 1991, the products from the Machinery and Equipment sector of the industry constituted 75.2% of Japan's total exports (Table 3.2). This sector has been virtually the backbone of Japan's economy, technology, and affluent social life after the War. This sector is, however, far more broad-based than many people outside Japan might think. The philosophy behind the development of this sector is the same as the philosophy behind the development of other sectors, i.e. independence from manufactured import and export of manufactures to pay for the import of resources from abroad. Japan has always considered 'full-employment' as the key to their planning. Thus, Japan did not leave any sector of industry untouched that could be within its means and experience. Japan's machinery and equipment did not enjoy any reputation for quality in the early postwar period. The lower cost was the only sales point of their products. Japanese industries were, however, conscious of their weakness and strength. They made vigorous attempts to import

[25] Masatomi Kasagi, "Pharmaceuticals", *Industrial Review of Japan*, 1982, pp. 112-113.
[26] Ibid.

technology for machinery manufacturing in 4,849 cases between January 1950 and August 1971.[27] Japan had shipbuilding facilities, aeroplane manufacturing plants, textile machinery plants, munition plants, truck manufacturing plants, and various other heavy and light industrial facilities since before the War. The foreign technology could thus be imported by the existing industries to improve the quality of their products. The technological gap between Japan and the West, that existed before Japan entered into War, widened during the War period. Japan desperately tried to narrow the gap at the earliest possible time. Japan's products thus started to gain competitiveness not only in price but also in quality. Japan's heavy investment in industrial plants and equipment coupled with technology and cheap and disciplined labour helped her achieve a production spurt in labour intensive areas initially for the protected local market and then for export.

The ban by the Allied force on certain specific industries related to armament and aeroplane production after the War virtually released their accumulated know-how for production of machinery and equipment. Japan thus started making enormous investments in heavy and capital intensive industries which were gradually occupying a larger and larger share in Japan's production, export and overall economy. When Japan no longer had any balance of payment problem in the mid-1960s, she invested in new high technology fields. Electronics thus opened a new opportunity for Japan's industries. Developments in the electronics industries brought about a new demand in new types of communication equipment as well as consumer household and office equipment. Japan's achievement in the automobile and shipbuilding industries helped her steel industries grow and improve in quality. Better steel know-how in turn made her automobile industries more and more competitive.

The pattern of growth in Japan's industries is always characterized by frequent innovations and diversifications of products. The beginnings were usually humble but determined. It is not possible to give details of all the industries here but a few industries shall be taken up for discussion giving some background of their start in prewar times.

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[27] Mustafizur Rahman, *Analysis of Japan's Economic Development*, paper presented, June 21, 1982, p. 10.

Automobile and motorcycle industry

Even since the first motor vehicle arrived in 1899, the Japanese attempted to manufacture automobiles.[28] The first locally built vehicle was a hand-made omnibus made with ordinary tools by Torao Yamaba in 1904.[29] Individual pioneers, however, did not continue because of the meagerness of earnings it could give. A passenger car was ordered in 1905 from Komanosuke Uchiyama, who was an engineer of Tokyo Motor Works, by a member of the Imperial family. It was said to be completed in two years. Tokyo Motor Works Ltd, in cooperation with Kunisue and eight other Japanese, brought out a car in 1911. This was the first four-cylinder engine vehicle on record in Japan. Kaishinsha Motor Co. Ltd produced DAT passenger cars in 1911. Hakuyosha Motor Co. Ltd produced 250 motor vehicles between 1921 and 1923. It also exported one vehicle to Hong Kong and another to Shanghai in 1923.[30]

These manufacturers however failed to continue their business because of financial difficulties. The shipbuilding industries, most advanced in the country around World War I, were interested in diversifying their activities to automobile manufacturing. They also failed because of higher production costs. The Japanese Imperial army also studied the possibilities of automobile production by studying European trucks. They produced trucks after the German model and found them to be of very good quality. In 1912, the Military Motor Vehicle Evaluation Committee was formed. The committee recommended against the army's keeping a large number of vehicles for financial reasons, but they recommended civilian use of vehicles which the army could use during emergencies. This recommendation was reflected in the Military Motor Vehicle Subsidy Act of 1918.[31] The government set up an automotive technique committee, and standard specifications for domestic vehicles were formulated. The Tokyo Gas and Electric Industry Company and the Tsurumi Motor Industry Company came out with their own products

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[28] Chan Sup Chang. "The Japanese Motor Vehicle Industry: A Study of the History of the Japanese Motor Vehicle Industry and the Impact of The Japanese Motor Vehicles on the US Market" PhD dissertation. The American University. 1974, p. 17.

[29] Ibid.

[30] Ibid., p. 18.

[31] Chang, op. cit., p. 20.

according to the standard specifications.[32] After a small quantity was produced, the production was stopped because of high production costs after 1931 when the subsidy was abolished.

The Kanto Earthquake of 1 September 1923 suddenly generated a demand for vehicles.

The US manufacturers did not have their own staff in Japan to sell the US products. The Ford Motors sent a man to investigate the Japanese market and based on his report, the Ford Motor Company of Japan was established in Yokohama in December 1924 to assemble trucks and passenger cars with a capital of ¥4 million (US$1.68 million). General Motors Japan started assembling Chevrolet trucks and passenger cars in Osaka in April 1926.

These two companies could enter Japan because the Japanese encouraged them to do so. They were 100% American-owned businesses. The encouragement given was a tariff incentive. Duties on complete vehicles were levied at 50% *advalorem* and those on parts were at 30 %. They could, however, assemble only 250,000 units until 1939 when they were forced to close down.[33]

The two US automobile giants indirectly helped Japanese auto industries by training their potential workers in production technology. The General Motors Japan also established a school to train Japanese workers interested in becoming mechanics. The US companies locally purchased various spares like tires, batteries, upholstery, glass, rubber parts, and various components produced in Japan. General Motors procured ¥6.32 million (US$3.12 million) worth of materials locally in 1930.[34] General Motors exported about US$5 million worth of products from Japan. When Ford and General Motors were visibly dominating the market, resulting in an unfavourable trade balance, the Japanese started feeling uneasy and the then Finance Minister urged the lowering of military and naval expenditure, i.e., the defence expenditure to produce balanced budgets. The Japanese government established the Japanese Industry Promotion Committee and the Minister of Commerce and Industry ordered a study on the Policy of establishment of Motor Vehicle

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[32] Mustafizur Rahman, *Approaches to National Economic & Industrial Planning for the Developing Countries—with special Reference to the Development Process of Japan* 1978, P. 58.

[33] Chang, op. cit., p. 24.

[34] Ibid., p. 26.

Industry in September, 1929. The study committee formed in June 1931 released a cabinet statement on 9 August 1935, as follows:

> The Japanese motor vehicle industry is still in a position inferior to Western countries for the supply of motor vehicles which are extremely important for national defense and our economy. As a result, it is urgent to establish the Japanese industry in the shortest period.[35]

This statement was the pre-arrangement for the Motor Vehicle Manufacturing Business Act of 29 May 1936, intended to restrict foreign manufacturing in Japan and to develop the Japanese industry.

The feeling of nationalism crystallized very quickly after the Manchurian incident in 1931. The government urged the merger of the existing companies in 1932 to compete with Ford and General Motors in Japan, and invited big trading groups (*Zaibatsu*) to participate in automobile manufacturing, who however did not come directly. Nissan (as *Jidosha Seizo Kabushiki Kaisha*) was created in 1933 and the Toyota Motor Co. Ltd in 1937. Toyota completed its plant on about 98 acres in Nagoya in 1938. General Motors wanted to join Nissan with 51% share and later even with 51% share for Nissan, but the agreement did not materialize.[36] General Motors became a licensed company in 1936 under the new Motor Vehicle Manufacturing Business Act and proposed Toyota Automatic Loom Works for a technical tie-up, but it was turned down by Kiichiro Toyoda, the founder of the Toyota Motor Company.[37] Ford tried to assemble motor vehicles of its own. It was trying to purchase about 32 acres for a plant. As the army was alarmed by the idea, the permission was delayed; but when it was no longer legally possible to block the permission, the Motor Vehicle Manufacturing Business Act was promulgated a day before the permission to Ford was due. After the Act was passed, Ford Japan was restricted in its assembly to 12,360 units annually.[38] Even this was not tolerable to the Japanese. Import duties were raised to 70% from 50% for complete vehicles, and higher specific duties were imposed for spares.

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[35] Chang, op. cit., p. 27.

[36] Ibid, p. 42 (The production system of Nissan was based on the American system supplied through a turn key plant by Graham-Paige of Detroit).

[37] Chang, op. cit., p. 33.

[38] Ibid., p. 35.

The production shares of the Ford Motors and the General Motors came down sharply leading to their closure in 1939. Chang comments on the causes for expulsion of the US automakers from Japan as "the policy... was based on militaristic nationalism."[39]

Thus the Japanese automobile industry had a history of its own extending to the prewar period. Both the founders of Toyota and Nissan, K. Toyoda and Y. Aikawa, had engineering backgrounds. K. Toyoda worked in his laboratory and manufactured a 4-horse power test engine modelled after Smith Motor in 1931 while Aikawa worked as a labourer disguising his status in a casting company in the US before they established their respective companies.[40] Their philosophy and hard work guided their industries to today's position.

A motor vehicle has over 3,000 parts and hundreds of subcontracts are given to parts makers by the automobile manufacturers. The development in automobile industry in Japan thus brought about the scope for expansion in parts industries. There are about 8,000 parts manufacturers who support Japanese automobile industries.

Japan entered the modern passenger car field in the early 1950s with research on and analyses of foreign small cars. To cite a few examples, Nissan Motor Company grew from the basic work of assembling the Austin parts; Isuzu Motors from assembling Hillman parts, and Hino Motors from assembling the Renault parts.

At this time, many aircraft makers started 3-wheeled vehicle production. To offset the late start, Japan imported technology in this field as she did in other fields. By 1970, 497 pieces of foreign technology were introduced in Japan. The techniques imported covered almost all important aspects of automotive industry. Once on the right track, the automobile industry enjoyed its export spurt all over the world, and particularly to the US market. The higher export profit encouraged the industries to invest further in production facilities and in research and development, resulting in a production spurt in automobiles. During the Korean War, the US Procurement of Japanese vehicles and orders for rebuilding of US vehicles in the Pacific area gave the Japanese automotive industry both technical and financial support of immense value to the industry at that crucial stage of reconstruction and early growth. Fuji Motors alone rebuilt about 187,000 units of US military vehicles in the Appama plant

[39] Chang, op. cit., p. 35.

[40] Ibid., p. 36, 40.

which also operated a production line. Fuji Motors is said to have earned about US$50 million out of this operation.[41] Toyota rebuilt about 300 vehicles, Nissan reconditioned about 1,480 motor vehicles, and a few other companies also took up rebuilding jobs in the early postwar period. In addition to their production, Japan regained its prewar production level around 1948.

The industry was offered a loan through the Reconstruction Finance Bank established in 1947 to overcome financial difficulties. The Supreme Commander of the Allied Powers (SCAP) also did not encourage production or a large-scale import of passenger cars in the early postwar period.[42] The domestic production of trucks and buses increased to 48,664 units in 1955 while passenger car production was still at the level of 20,300 units. The passenger car production moved faster than truck and bus production. In 1968, passenger car production at 2,055,821 units surpassed truck and bus production at 2,030,005 units. The 3-wheeler production in 1962 was as high as 144,167 units which was, however, falling gradually to 14,061 units in 1970 and to 1,020 units in 1974 to finally cease in favour of more advanced 4-wheelers which the society could afford now.

The wisdom of giving priority to automobile industries from before the War has paid off. Table 3.7 shows that Japan exported 16,011 units of passenger cars and 50,679 units of trucks and buses in 1962. As of 1981, her production of passenger cars alone was 6,977,000 units. Import was just 32,000 units while export was 3,947,000 units. Automobile exports alone earned her US$26,521 million (FOB) in 1981. Japan's achievement in automobile fields extends beyond the production and export figures. Japan is now building or going to build automobiles in the US, Spain, Italy, Mexico, Australia, the UK, Egypt, Pakistan, India, and various other places of the world.

Japan is already number one in the production volume of automobiles. Japan is diversifying and utilizing automobile production know-how in other profitable and potential fields of weaponry as well. The US and the European makers, who pioneered the automobile industry, were seeking Japanese help. The UK requested Nissan to start production there. Honda-designed vehicles are already

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[41] Chang, op. cit., pp. 64-65.

[42] SCAP stands for the Supreme Commander of Allied Powers.

Table 3.7. Japan's domestic production, import and export of automobiles in selected years.

Year	Production				Export of automobiles		
	Trucks & buses (no.)	Passenger cars ('000)	[a]Import for local ass'ly [b]prod. (no.)	Import complete units (no.)	Bus & truck ('000)	Passenger cars ('000)	Total value (US$ million)
1929	437	-	(a) 29,338	5,018			
1930	458	-	19,678	2,591			
1931	436	-	20,109	1,887			
1932	880	-	14,082	997			
1933	1,681	-	15,082	431			
1934	2,247	-	33,458	896			
1945	6,900	-	(b) Three				
1950	30,004	1.6	wheeler		1.137	0.007	
1955	48,664	20.3	prod.	6,544	1.229	0.002	
1960	364,000	-165.1	278,032	4,326	31.8	7.0	
1962	721,922	268.8	144,167	12,154	50.7	16.0	-
1963	875,701	407.8	117,190	11,854	67.1	31.4	109.70
1964	1,122,815	579.7	80,048	12,831	83.5	67.1	147.80
1966	1,408,743	877.7	33,364	15,732	102.6	153.1	265.10
1967	1,770,731	1,375.8	26,453	14,864	138.8	223.5	378.10
1968	2,030,005	2,005.8	21,794	15,532	206.2	406.3	631.50
1970	2,110,499	3,178.7	14,061	19,552	361.2	725.6	-
1972	2,272,149	4,022.3	3,197	25,000	557.9	1,407.3	2,964.50
1973	2,612,207	4,470.6	2,904	37,000	616.7	1,450.9	3,611.90
1974	2,619,998	3,931.8	1,020	42,000	890.7	1,727.4	5,227.40
1975	2,373,471	4,567.9	0	46,145	850.3	1,827.3	6,190.40
1976	2,813,655	5,027.8		40,000	1,170.7	2,539.0	-
1978	3,293,185	5,976.0		55,000	1,558.5	3,042.0	-
1979	3,459,775	6,176.0		65,000	1,460.8	3,102.0	21,601.00
1980	4,005,000	7,038.1		47,917	2,019.8	3,947.1	29,381.00
1981	4,205,831	6,974.0		33,368	2,101.9	3,946.5	-
1982	3,850,208	6,881.6		36,119	1,820.5	3,770.0	-
1985	4,624,279	7,646.8		53,151	2,303.7	4,426.8	42,859.00
1989	3,973,000	9,052.4		196,682	1,480.8	4,403.0	61,634.00
1990	3,539,000	9,947.9		252,841	1,349.1	4,482.1	50,959.00
1991	3,492,363	9,753.1		197,378	1,301.1	4,452.2	-
1992	3,120,590	9,378.7		187,230	1,258.8	4,408.9	-

Sources: Ministry of International Trade and Industry, *Statistics on Japanese Industries 1969* (Tokyo: Tsusho-Sangyo Chosakai, 1969), p. 67; Chan Sup Chang, "The Japanese Motor Vehicle Industry" (PhD Diss., The American University, 1974), pp. 26, 76; Mustafizur Rahman, "The Current Issues in U.S.-Japan Trade" (Paper submitted to Century University, Oct., 1982), p. 7; Hajime Takano and Junichi Taki, "Automobile", *Industrial Review of Japan 1980* (1980), p. 66; *Japan Economic Journal*, Tokyo vol. 21 No. 1047, March 18, 1983, p. 9; Japan Motor Industrial Federation, *Guide to The Motor Industry of Japan*, 1973), pp. 146-47; (1977), pp. 182-83. *Statistical Handbook of Japan* 1992, Statistics Bureau, Management and Coordination Agency, *Japan 1992, Keizai Koho Center*

being made by BL Limited of the UK. General Motors, which was not given cooperation for joint production in 1936 in Japan by Toyota, invited Toyota under an agreement to manufacture cars jointly in the USA in one of General Motors' own idle plants. Honda and Nissan have already built their plants in the US. Ford is taking delivery of Toyo Kogyo built automobiles and spares for sales in the US under Ford's brand name. Chrysler is not only selling Mitsubishi built vehicles, it also has sought Mitsubishi's help to get over financial difficulties at times.

General Motors has already made agreements with Isuzu and Suzuki to make automobiles for the firm. Japan can now bargain for favourable terms in any agreement with the US giants. Nissan has already started a truck venture in Egypt under an Egyptian government condition to raise the level of local content to 60% after five years' time.[43] The European manufacturers with a long history of small car manufacturing are also desperately seeking Japanese help. Volkswagen of Germany has an agreement with Nissan. Honda Motor has made an agreement with Daimler-Benz, the second largest automobile giant of Germany, to produce subcompact jointly in South Africa. Nissan has also taken up a joint venture with Alfa Romeo of Italy.[44] The irony of history created by Japan's development is also visible in many other fields, but the development in the automobile industry is a typical case with a wide spectrum of triggering effects on many other industries.

It is yet to be seen whether Japanese automobile industries has reached a saturation point and will now gradually fall as the automobile industries of the West, or whether they will perpetuate their hold all over the world by innovating strategies backed by the economic power Japan has now achieved. But from all indications, it appears unlikely that Japan shall lose in any competition with the West that easily in the automobile field. The 11 automakers of Japan already have the capacity to make 40% of all the cars sold in the world. By 1997, Japan's domestic and overseas production capacity will be more than 20 million vehicles per year, one million more than what was in 1993. Japan's overseas plants produced 5.28 million vehicles in 1993. The capacity will increase to 6.7 million

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[43] *The Japan Times*, April 2, 1983, p. 6.

[44] Tetsuo Sakiya, *Honda Motor* Tokyo: Kodansha International 1982, pp. 15-19.

vehicles in 1997, as forecasted by Nagoya based Fourin Inc.[45] It shall not be a wonder if the entire automobile industry of the world one day falls under the influence or control of the Japanese makers, even though the US and the European automobile manufacturers are now consciously trying to rationalize and revitalize their industry to compete with Japan again, if necessary, even with political backing from the home governments.

The motorcycle industry is another sector of industry that grew too fast after World War II. The name of Soichiro Honda, who was born in 1906, is synonymous with the motorcycle industry in Japan. To explain the growth of the motorcycle industry some reference to Honda may be appropriate here. Unlike K. Toyoda or Aikawa, the founders of Toyota and Nissan, respectively, Soichiro Honda had neither any formal higher education nor a sound financial background. Starting his practical life in Tokyo at the age of 15 at an automobile workshop named Art Shokai, he gained his experience in automobiles, mainly racing cars which the owner of the workshop was fond of. He even did baby-sitting in the house of his employer, Yuzo Sakakibara to gain the favour of being put to work as an apprentice. Soichiro Honda had the opportunity to learn skills in building race cars. He repaired bicycles at his father's blacksmith shop and learned automobile skill at Art Shokai, but he found it difficult to manufacture piston rings when he established a business for the purpose in 1937. His simple casting method did not give him quality. He then realized the importance of education and consulted a technical school teacher. He finally produced quality products in his Tokai Seiko and supplied them to Toyota which later acquired 40% of his firm's shares. To meet high demand for piston rings, Honda invented automatic machinery to mass-produce them. He also made machines to produce wooden propellers for army planes.

Honda was a prewar industrial hero[46] and, immediately after the War, he wanted to maintain a low profile and sold out shares of his Tokai Seiko to Toyota Motor for ¥450,000 (US$800,000 equivalent or more now).[47]

Honda's postwar business started with his establishment of the Honda Technical Research Institute in October 1946 in Hamamatsu.

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[45] The Nikkei Weekly, June 21,1993, p.9.

[46] Sakiya, op. cit., pp. 49-56.

[47] Ibid., p. 56.

Its first job was to recycle small engines which had been used by the Japanese Imperial army for communication purposes. Bicycles fitted with the reconditioned engines were sold at high profit. New 50 cc engines were soon developed to mount on bicycles. The Honda Technical Research Institute was converted to Honda Motor Co. Ltd in September 1948. It came out with D-type 2-stroke 98cc motorcycle in August 1949. Honda Motor expanded its production and improved the quality of its motorcycles to create a sensation in the world. Honda started overseas production in Belgium as early as 1962. It then diversified into the automobile field in the same year. There are now other manufacturers of motorcycles like Suzuki, Kawasaki, and Yamaha.

Now, Japanese motorcycles dominate the world market. As of early April 1983, almost four out of every five large (about 700 cc) motorcycles in the USA were of Japanese origin. The US government thus decided to raise the then existing tariff of 4.4% on such imports to 49.9% to save the local industry, particularly Harley-Davidson Motor Co. and make those foreign, mainly the Japanese, manufacturers which were not yet making motorcycles in the US to manufacture them there.[48] Japan's production volume of motorcycles was about 3,000 units in 1950 (Table 3.8). It rose to 5.9 million units in 1978 and to 7.413 million units in 1981. In addition, her motorcycles are being produced or are going to be produced all over the world including the US, France, China, and many other Asian countries either under license or in joint venture. In Thailand, Malaysia, the Philippines, and Indonesia alone Japan's four major motorcycle makers were expected to produce 1.95 million motorcycles in 1993. Unless something extraordinary happens in the international market, the Japanese motorcycle industry shall very likely continue to dominate the world in the foreseeable future.

Despite fast development in the automobile and motorcycle industries, Japan did not abandon its bicycle production as late as the 1970s or 1980s. As in the case of other industries, Japan made best use of whatever technology she once gained to excel in the field both to meet her local demand and to enter the world market. Bicycles were being produced since the prewar time to gradually replace Jin rickshaw (man-pulled rickshaw). She produced 20,000 units of bicycles in 1945, but the production level rose to 981,000

[48] Nihon Hoso Kyokai (NHK), *News Report*, April 2, 1983.

units in 1950; 1,109,000 units in 1955; 3,291,000 units in 1960; 4,529,000 units in 1970; 5,972,000 units in 1975; and to 7,082,000 units in 1980. Japan exported about 1,550,000 units of finished bicycles in 1972 and 1,130,000 units in 1980.[49]

Table 3.8 Japan's production and export of motorcycles in selected years.

Year	Production ('000 units)	Export		Year	Production ('000 units)	Export	
		'000 units	% of production			'000 units	% of production
1950	3			1971	3,402	2,279	67.0
1955	195			1972	3,565	2,437	68.4
1960	1,368	56	4.1	1973	3,763	2,492	66.2
				1974	4,509	3,240	71.9
1961	1,698	78	4.6	1975	3,803	2,691	70.8
1962	1,675	202	12.1				
1963	1,928	400	20.8	1976	4,235	2,922	69.0
1964	2,110	593	28.1	1978	5,900	3,720	63.1
1965	2,213	869	39.3	1980	6,435	3,964	61.6
				1981	7,413	4,263	57.5
1966	2,447	976	39.9	1985	4,536	2,849	62.8
1967	2,242	944	42.1				
1968	2,251	1,137	50.5	1989	2,794	1,552	55.5
1969	2,577	1,299	50.4	1990	2,807	1,713	61.0
1970	2,948	1,738	58.9	1992	3,197	1,669	52.2

Sources: Keizai Koho Center, *Japan 1982* (Tokyo: Keizai Koho Center, 1982), p. 34; MITI, Statistics on Japanese Industries 1969, p. 67; Shinji Tanaka and Hideo Kato, "Automobiles", *Industrial Review of Japan*, 1983, pp. 70-71, 91; JAMA, *Motor Vehicle Statistics of Japan* 1961-1993.

Agricultural and construction machinery industry

Japan's agricultural mechanization is responsible for increases in agricultural productivity and releasing vast numbers of agricultural labour for industries. As in other cases, Japan did not take up mechanization by importing farm machinery. Because of fragmented farmland and small farm holdings in Japan, Japanese farming equipment was designed to suit her farmers. Initially, they used simple pedal threshers, hullers, and implements. Simply about 100 units of power tillers were in use in 1931 and 8,000 units in 1947. This number grew quickly to 227,000 units in 1957; 1.41 million units in 1962; 2.49 million units in 1965; and to 3.16 million units

[49] Tadaaki Matsuoka and Toshio Ohtsuka, "Timepieces, Bicycles & Sewing Machines", *Industrial Review of Japan, 1982*, pp. 99, 155.

in 1970.[50] Japan gradually introduced larger and more sophisticated equipment like riding tractors, planters, and combines as suited to her farms. Development in the farm machinery industry also gave Japan the opportunity to earn substantial foreign exchange by export. Table 3.9 shows that the production of agricultural machinery was of ¥178 billion (US$494.40 million) in 1970. The production volume increased in value to ¥248 billion (US$914.40 million) in 1973 and to ¥627 billion (US$2,765.20 million) in 1980. The export earnings from agricultural machinery were ¥16.7 billion (US$46.40 million) in 1970, but rose to ¥116 billion (US$511.60 million) in 1980. This rising trend has been continuing with occasional fluctuations. Japan's present export constitutes about 20% of the total sales, but it wants to achieve an export target of 30% of the total sales as early as possible.

Heavy industries produce construction machinery. The development of this industry calls for experience in steel industry and rugged machine building technology. Japan's industrial background is helpful for this sector of industry. Japan produced US$2,238 million worth of construction equipment in 1973 (Table 3.9). The production volume rose to US$5,292.20 million in 1980. Her export volume of construction machinery was already US$1,314.20 million in 1979. Japan considers its technology to be of high level already. The industries are now cancelling their technical ties with foreign companies to drive their exports independently. Komatsu Ltd, for instance, terminated its production license contract with Bucyrus-Erie of the US and Ishikawajima-Harima Heavy Industries Co. cancelled a similar tie-up with Koehring, also of the US. In 1981, Kobe Steel Ltd terminated its technological tie with another US company, Harnischfeger. This policy paid off immediately. Komatsu chairman, Ryoichi Kawai, during his visit as a member of a big businessmen mission headed by Shigeo Nagano, President of the Japan Chambers of Commerce and Industry, quietly signed a contract with the Soviet Union in February 1982 to supply 500 units of pipelayers valued at ¥50 billion (US$212.80 million) for their Siberian natural gas project which the US was trying to block by putting an embargo on sales of US products or US-licensed products for the purpose. This order was in addition to Komatsu's earlier

[50] Rahman, Mustafizur. *Approaches to National Economic & Industrial Planning for the Developing Countries*, p. 26.

order for supply of 400 units of pipelayers.[51] This is still a small part of a long-term drive for the industry. It is just a simple case of international industrial competition, but aggressive acquisition of and merger with international competitors are now giving the Japanese construction equipment manufacturers a sharper edge in competition despite rising yen value. Had it not been for political reasons, Japan would have been in a position to put the US and the EC makers on the defensive in the world market, as in the case of automobile and other sectors.

Table 3.9 Japan's agricultural and construction machinery production and export in selected years.

Year	Agricultural machinery (US$ million)		Construction machinery. (US$ million)		Exchange rate ¥ = US$
	Production	Export	Production	Export	
1970	494.40	46.40			360.00[a]
1971	434.50	39.20			349.83
1972	544.40	37.60	1,557.20	178.20	303.11
1973	914.40	57.50	2,238.00	258.80	271.22
1974	1,602.30	95.90	2,191.50	540.90	292.08
1975	1,674.60	97.70	2,162.80	807.00	296.79
1976	2,114.30	148.40	2,029.70	974.20	296.55
1977	2,454.20	230.90	2,579.00	1,002.60	268.51
1978	2,551.80	384.90	4,493.00	1,398.00	210.44[b]
1979	2,655.80	460.90	5,101.80	1,314.20	219.14
1980	2,765.20	511.60	5,292.20	2,637.30	226.75
1981	2,471.30	634.80	5,563.90	2,711.60	220.53

[a]The rate of yen 360 to a dollar continued from Apr. 25,1949, to Aug. 28. 1971.
[b]The yen recorded a peak of ¥175.50 to a dollar on Oct. 31. 1978.

The 19 April 1993 peak value of yen was ¥110.70 to US$ 1.

Sources: Keizai Koho Center, *Japan 1981*, 1981, p. 39; (1982), P. 41; Makoto Katsuike, "Construction & Agricultural Machinery", *Industrial Review of Japan, 1982,* Tokyo Nihon Keizai Shimbun, 1982, pp. 92-93; Takao Matsui, "Construction & Agricultural Machinery", *Industrial Review of Japan/1980,* 1980, pp. 99-89; Akira Okada, "Construction & Agricultural Machinery", *Industrial Review of Japan, 1983, pp. 80-81.*

Shipbuilding industry

The shipbuilding industry has been an important sector of industry in the postwar period, particularly in the early postwar period. The

[51] *The Japan Economic Journal*, Vol. 21, No. 1048, March 15, 1983, pp. 1-2.

postwar development of this industry is immense but its prewar development was also massive and had a great weight in the development of other sections of industry and the shipping business.

A short historical background may be necessary for understanding the pattern of growth of this sector of industry. During the period of Sakoku (isolation) from 1639 to 1854, building of ocean-going vessels was banned to keep the Sakoku effective. But when foreign vessels representing a variety of nations like Great Britain, France, Russia, and the US started sailing into Japanese ports occasionally from 1790 to persuade the Japanese to change their policy of Sakoku, Japan realized the importance of shipbuilding industry.[52] The ban was finally lifted in 1853, the year in which the mission of the US Commodore Mathew Perry arrived in Japan. The news of Chinese defeat by British forces in the Opium war of 1839-42 also influenced the Japanese government to lift the ban on construction of vessels to match the foreigners in future. The Bakufu sent notices to the clans around Edo (Tokyo) to engage in construction of vessels. Dockyards were built by the government at Uraga and by the Mito clan at Ishikawajima, and machinery were ordered from Holland. Quoting Takayanagi, Blumenthal points out:

> The first technology to be introduced came from the Dutch through a book, Suijosen Setsuryaku (Short Explanation of steamships), translated by the Satsuma clan in 1849; this was followed by Dutch engineers and equipment. However, it was under Russian supervision that the first foreign-style ship was built in Japan. In 1853, the Russian admiral Putiatin came to Japan to sign a trade treaty; while at anchor his ship was badly hit by an earthquake... a new ship by the name Hetago was constructed by Russian crew and Japanese carpenters in four months... sixteen sailing boats of the same type were built at Heta and Ishikawajima... The craftsmen who took part in the construction went to other dockyards and became figures in later years.[53]

To make the training formal and systematic, a Naval Training School at Nagasaki was opened in 1855. A Dutch ship, the Kankomaru, was used for demonstration and a Dutch crew was employed to teach shipping and shipbuilding techniques. However,

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[52] Nobutake Ike, *Japan The New Superstate* (1973 reprint ed.; Stanford Alumni Association, San Francisco: W. H. Freeman, 1974), pp 18-19.

[53] Tuvia Blumenthal, "The Japanese Shipbuilding Industry" in *Japanese Industrialization and its Social Consequences*, ed. Hugh Patrick (Berkeley: University of California Press, 1976), p. 133.

the school was closed in 1859 and the ship, together with other new ships, was transferred to Warship Training School at Edo.[54] Yokosuka Iron Works was established in 1864 under the supervision of a Frenchman, Francois Leon Verney. Machines were imported from France, and a school was opened for ship engineers and mechanical workers. The school was closed for some time to be reopened in 1880. Students graduating from the school became influential both in the navy and in private companies.

Foreign shipbuilding technology was not only transferred by foreign instructors and advisers but also by Japanese students who were sent abroad to study, which was a rather cheaper way. As a result of their efforts, a naval steamship, the Chiyodagata, was completed after four years' work by the Japanese in 1866 without direct foreign assistance. The 60-horsepower engine was produced at Nagasaki and the body was constructed at Ishikawajima. Though quantitative achievement so far was not high, "a modest start was made and a foundation was laid for the adoption of Western technology".[55]

After the Meiji Restoration in 1868, the government took an initiative to promote the shipbuilding industry and later sold many dockyards to private companies at a nominal price. "In 1876, the Ishikawajima yard was sold to Hirano Tomizo; in 1881, the one in Nagasaki was bought by Iwasaki Yataro (founder of Mitsubishi); and in 1887, the Hyogo yard was sold to Kawasaki Shozo".[56] Now the only hurdle to the production spurt was the lack of raw material, because steel mills were not yet built. The navy still imported their main vessels from Britain. The establishment of the first large-scale steel mill in 1901 and the Russo-Japanese War (1904-05) brought about the real take-off in the shipbuilding industry. Japan gradually improved the quality of its ships and managed price competitiveness with government subsidy. The import of vessels sharply fell. Her shipping business was expanding. As early as 1913, Japan launched 2% of the world's total in gross tons, and her share rose to 15.4% in 1933; 26.2% in 1956; and 50.8% in 1968.[57] Japan entered the international market between 1913 and 1918 when Japanese industry was enjoying a war boom.

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[54] Ibid.

[55] Ibid., p. 134.

[56] Blumenthal, op. cit., p. 134.

[57] Ibid., p. 130.

Table 3.10 shows that Japan had launched 14,820 gross tons between 1874 and 1884; 497,062 gross tons between 1906 and 1915;

Table 3.10 Japan's production and export of shipping vessels, and employment in shipping industry in selected years.

Year	Production	Export			Workers ('000)
	gross ton ('000)	Gross ton ('000)	As % of production	Million US$ (FOB)	
1874-1884	14.8				
1885-1895	38.9				
1896-1905	203.6				
1906-1915	497.1				
1918	626.7	400.0[a]		-	82.0
1931	54.0				29.0
1932	152.0				30.5
1937	451.0				95.5
1940	354.8				130.3
1944	1,935.2				333.7
1948	163.3	0.8	0.5		-
1950	227.0	76.1	33.5		-
1951	442.8	35.3	8.0		120.4
1955	502.4	261.4	52.0		118.1
1956	1,529.4	1,119.0	73.2		135.5
1957	2,230.7	1,433.8	64.3		150.2
1960	1,807.2	935.4	51 8		146.7
1963	2,31..2	1,158.1	54 3	340	150.6
1965	5,526.6	2,991.3	54 1	748	142.4
1968	8,481.4	5,109..9	60.2%	1,084	150.6
1970	10,480.0	-		1,410	-
1972	12,860.0	-	-	3,819	-
1974	17,610.0	-		5,600	-
1975	17,990.0	12,617.0	70.1	5,998	-
1977	9,940.0	-		8,129	-
1980	6,094.0	3,411.0	56.0	4,682	201.2
1982	8,163.0	-	-	6,870	204.9
1985	8,906.0	6,160.0	69.2	5,996	189.1
1989	5,262.0	3,968.0	75.4	4,428	128.1
1990	6,476.0	5,123.0	79·1	5,566	127.3
1992	7,582.0	-	-	-	133.9

[a]The figure consists of 300,000 gross tons of newly built and 100,000 gross tons of old vessels.

Sources: Tuvia Blumenthal, "The Japanese Shipbuilding Industry" in *Japanese Industrialization and Its Consequences*, ed. Hugh Patrick (Berkeley: University of California Press, 1976. pp 137, 139, 140, 143, 146; Shin-ichi Kamata, "Shipbuilding", *Industrial Review of Japan, 1979*, pp. 68, 69; *Industrial Review of Japan, 1983*, p. 159; Keizai Koho Center, *Japan, 1982* -1993; MITI, *Statistics on Japanese Industries*, 1969. p. 67.

163,308 gross tons in 1948; 1,529,420 gross tons in 1956; 5,526,610 gross tons in 1956; and 15,227,000 gross tons in 1975. Japan's earnings from export of vessels were US$1,084 millions in 1968, but it rose to US$7,274 millions in 1981. As this industry is quite labour intensive, Japan is now facing competition from newcomers like South Korea, Taiwan, and other countries. It remains to be seen whether Japan outperforms her competitors by some innovative measures in the near future. But there is no possibility that Japan will withdraw from the industry to be ever dependent on imports again.

The worst that might happen would be a lower export volume. The industry has demonstrated its ability to adjust itself during crises many times. In the face of recession, the industry cut or transferred to other industry the jobs of about 85,000 workers in 1979. This type of action can hardly be possible in any other industrialized country. Development of new shipbuilding materials, introduction of advanced technology, and the use of financial manoeuvring for export promotion is not yet exhausted and might be applied to this field whenever international market demand expands or can be created. Nippon Kokan's 15-year contract to introduce low-speed fuel-saving engine technology from Sulzer Freres S.A. (Brothers Ltd) of Switzerland manifests the consciousness of the industry for their future.[58]

Machine tool industry

Japan did not want to rely on imported machine tools for her machinery production. She started making machines to produce machines. They were already in use before the War. It is believed that women and students were forced to operate various machine tools to produce bullets and other army requirements during the War. The expansion, however, was too fast after the War. The quality of Japanese machine tools was improved by the introduction of foreign technology manifested by surging exports to those countries in Europe and the USA which had supplied technology to her. Table 3.11 shows that the production of machine tools was 7,000 units in 1945, but it went up to 115,000 units in 1961 and to 257,000 units in 1970. The progress in electronics brought about a revolutionary change in machine tools. The numerically controlled machines were gradually occupying larger and larger shares.

[58] *The Japan Economic Journal*, vol. 21, No. 1051, April 5, 1983, p. 12.

Table 3.11 Japan's machine tool and industrial robot production and export of machine tools in selected years, robot population in Japan and the USA.

Year	Machine tools			Industrial robots			
	Production		Export	Production		Robot population	
	Units	US$ Mil.	US$ Mil.	Units	US$ Mil.	Japan	USA
1945	7,000						
1950	4,000						
1955	18,000						
1960	80,000						
1961	115,000						
1963	121,000						
1965	90,000						
1968	184,000			200	1.10	-	-
1969	231,000			600	5.30	-	
1970	257,000	867.50		-	13.60		-
1971	184,000	-	-	1,300	12.30	-	-
1972	164,000	-	-	1,700	20.10	-	-
1973	213,000		-	2,500	34.30	-	-
1974	169,000	-	-	4,200	39.00	-	-
1975	88,000	-	-	4,400	37.40	-	-
1976	119,000	770.90	256.50	7,200	47.50		-
1977	131,000	1,165.10	430.10	8,600	80.40	-	-
1978	136,000	1,737.00	770.50	10,100	129.70	-	
1979	164,000	2,209.20	943.00	14,500	193.50		-
1980	178,890	3,012.30	1,188.90	19,893	345.80	-	-
1985	175,238	4,406.40	1,655.90	48,490	1,258.10	93,000	20,000
1990	196,125	9,001.30	3,148.00	79,443	3,759.20	274,210	41,304
1991	171,341	9,407.60	3,057.70	-	-	-	-

Sources: Nobumitsu Sakurauchi, "Machine Tool", *Industrial Review of Japan, 1982*, p. 90; (1983), pp. 78-79; Shinichi Kamata, "Industrial Robots", *Industrial Review of Japan, 1983*, pp. 46-47; Ministry of Foreign Affairs, Japan, *Statistical Survey of Japan's Economy, 1971*, Tokyo, p. 23; Economic & Foreign Affairs Research Association, *Statistical Survey of Japan's Economy, 1978*, Tokyo, p. 23; Masao Kubota, "Japanese Machine Tools: Research and Development", *Japanese Machine Tools*, Japan Machine Tool Builders' Association, Tokyo, 1972, p. 9.

The recent development in microelectronics is bringing in another change in the nature of machine tools. Machining centres equipped with microprocessors have now reached a high stage of automation. Robots are adding another dimension to this automation process to make it possible to maintain an unmanned machine tool

making factory. Japan's Fujitsu Fanuc put one such factory to produce robots in operation in January 1981.[59] Japan's production volume of machine tools reached ¥365,525 million (US$1,737 million) in 1978; ¥484,132 million (US$2,209 million) in 1979; ¥683,860 million (US$3,012 million) in 1980; and ¥851,312 million (US$3,860 million) in 1981. Her exports of machine tools were ¥76,073 million (US$1,409.2 million) in 1981. This industry was providing jobs for 33,737 workers as of 1980. This achievement of Japanese machine tool industry was in sharp contrast with the present financial difficulties of French and German manufacturers reportedly seeking Japanese financial and technological help in 1980.[60] Japan's success in this field seems to lie in her industry's capability in keeping pace with and utilizing the fruits of technological development in other sectors of industry.

Light precision industry

Fast development in the machine tool industry contributed greatly to all other sectors of machine and equipment making. Japan's woman power was suited for precision work. Light precision equipment like cameras, watches, clocks, electronic parts, electronic equipment, and electrical appliances utilized woman power very profitably. Table 3.12a shows that Japan produced 193,000 cameras in 1950, but this production volume rose to 4.6 million pieces in 1964; 5.813 million in 1970; 6.464 million in 1977; 13.130 million in 1979; and to 15.930 million pieces in 1982. The production in terms of value was Japanese ¥291,694 million (US$1,518.4 million) in 1982.[61] Japan exported 9.460 million units of her cameras in 1979 and 11.730 million units in 1982.[62] Japan exported more than 70% of her camera products. The production of scientific equipment was definitely another postwar achievement of Japan. The optical and scientific equipment combinedly had earned foreign exchange of US$5,512 million in 1981 compared to her export of these items at US$1,320 million in 1974. The progress in this field is mainly the result of her technological efforts to develop new and better products one after another over the last decades and better access to the

[59] Nobumitsu Sakurauchi, "Machine Tools", *Industrial Review of Japan, 1982*, pp. 90-91, 97.
[60] Sakurauchi, op. cit., p. 97.

[61] Hideaki Suzuki, "Cameras", *Industrial Review of Japan, 1979*, p. 83.

[62] Hideaki Suzuki, "Cameras", *Industrial Review of Japan, 1983*, pp. 86-87.

US and EC market after the fall of some optical equipment giants like Zeiss of West Germany at Japanese hands.

Japan produced 98,000 pieces of watches and clocks in 1945, but the production volume went up with an improvement in quality over the last decades. The introduction of digital watches brought in new manufacturers of watches as well. The production volume of watches and clocks was 17.193 million pieces in 1961; 49.695 million pieces in 1970; and 84.803 million pieces in 1977. During 1980, Japan produced about 88 million pieces of watches and 60 million clocks. The watch value hit ¥380 billion (US$1,676 million) and clocks ¥128 billion (US$565.5 million) in 1980.[63]

Electrical and electronic appliance industry

In the prewar period, Japan did not indulge in a higher standard of living with electric household appliances, but she took them up for production vigorously after the postwar rehabilitation period. She produced 5,000 units of electric refrigerators and 2,000 units of washing machines in 1950. The production volume rose to 3,205,000 units of refrigerators and 2,644,000 units of washing machines in 1964. Television production increased rapidly after transistor quality improved substantially in the 1960's. Before colour television was introduced and its price was at a reasonable level in 1960s, black and white (B & W) TV production rose sharply, but colour TV production overtook black and white TV production in 1971 in which total TV production rose to 13.231 million units, including 6.872 million units of colour TV sets. While black and white TV production and export was still continuing, colour TV production and export was rising sharply in the 1970's. Many Japanese manufacturers started production of colour TV in the US and many other countries. Most US local manufacturers were virtually driven out of the TV business.

With the rise in colour TV production not yet stopped, video tape recorders (VTR) came to market and most US and European pioneers made contracts with Japanese producers for their supplies for marketing in their areas under the foreign companies' brand name. Thus Japanese manufacturers could easily have a dominating role in VTR exports all over the world. Restriction on import of

[63] Tadaaki Matsuoka and Toshio Ohtsuka, "Timepieces, Bicycles & Sewing Machines", *Industrial Review of Japan, 1982*, p. 98.

VTR by France in early 1980s was a reaction to the excessive exports by Japan. Table 3.12a shows the production of colour TV that rose to 8.021 million units in 1975, 12.643 million units in 1980, and to 12.166 million units in 1982. In terms of value, the production was ¥584,481 million (US$1,969.4 million) in 1975 and ¥739,020 million (US$3,351.1 million) in 1981. The production volume of VTR was 119,000 units in 1975, but it rose to 9.498 million units in 1981 and to 13,130 million units in 1982. In terms of value, the production volume was ¥24,751 million (US$83.4 million) in 1975; this rose to ¥1,086,799 million (US$4,928.1 million) in 1981 surpassing colour TV production in Japan.

Japan's radio receivers, audio tape recorders, stereo sets and other pieces of audio equipment had already seen their production and export spurt in the 1950's through the 1970's. Radio receiver production was 88,000 units in 1945; 12.85 million units in 1960 and 32.62 million units in 1970, after which the production fell gradually to 17.31 million units in 1977 and to 14.30 million units (excluding kits) in 1982. Stereo set production reached 3.59 million units in 1974 and have maintained a level around 2 to 3 million units even now. The manufacturers successfully diversified their production to other electronic equipment in response to market demand for new products. Similarly, the growth in production of refrigerators, vacuum cleaners, washing machines, microwave ovens, and air-conditioners, between early 1970 and now, was almost stagnant but, maintaining a high level of production over 4 million units for washing machines and refrigerators, about 4-5 million units for vacuum cleaners, around 2 million units for microwave ovens and about 3-4 million units for airconditioners, is an achievement in itself in international comparison. Japan also exported about 1.5 million units of microwave ovens in 1982. Japan no longer expects high exports in the field of ordinary home appliances, but if makers in the US, Canada, or the EC relax their production efforts, Japan shall get another chance.

Japan has already made advances into the world market with her office equipment. Japan produced 1,275,000 units of plain paper copiers in 1981. The personal computer production volume for the same year was 282,000 units. Facsimile machine production reached ¥120 billion (US$544.10 million) in 1981. Japan now controls a wide market for its word processors, personal computers, and printers.

Table 3.12a Production and export of TV sets, VTR/VCR, cameras, watches and clocks, transistors, ICs and facsimiles in selected years.

Year	TV sets			VTR/VCR		Camera (35mm. still)		Watches & clocks export production	Transistors production	IC production	Facsimile production
	Prod. ('000)		Export	Production	Export	Production	Export				
	B&W	Colour	(US$M)	('000)	US$M	('000)	(US$M)	(US$M)	(million)	(million)	('000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1950						193					
1955	137					1,065			86.50		
1960	3,578[a]					1,859			139.80		
1961	4,609[a]					2,371			180.20		
1962	4,880	4				3,123			231.70		
1963	4,912	4	41.30			4,066	27.70	11.10	167.60		
1964	5,216	57	57.90			4,597	47.30	16.60	416.00		
1965	4,092	98	84.90			3,916	52.40	25.90	454.10		
1966	5,123	520	146.50			3,255	64.00	39.90	617.10		
1967	4,756	1,242	164.60			3,632	81.70	50.80	766.20		
1968	6,405	2,735	266.40			4,063	92.00	68.60	939.00		
1969	7,851	4,834	–			4,801	115.20	–	1,382.20		
1970	7,383	6,399	–			5,813	127.10	–	1,813.40		
1971	6,359	6,872	–			5,342	153.30	116.70	1,637.90		
1972	5,915	8,388	565.00			5,318	208.40	161.50	2,174.50		
1973	5,656	8,758	608.20			5,685	250.90	200.00	2,961.40	269	
1974	3,750	7,323	519.20			6,644	298.00	286.70	2,967.00	306	
1975	3,152	8,021	782.80	119	–	7,324	297.30	323.10	2,201.50	302	22.00

(Contd.)

Table 3.12a *(Continued)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1976	4,576	11,148	1,374	288	104.40	8,130	–	–	3,899	625	55
1977	4,710	9,874	1,329	762	245.50	9,669	–	–	4,151	758	–
1978	5,568	8,876	1,318	1,470	599.00	-	–	–	–	1,120	–
1979	4,214	9,828	1,283	2,199	1,014.90	10,194	–	–	4,306	1,694	–
1980	4,295	11,661	1,660	4,441	1,956.50	11,802	–	–	5,528	2,543	100
1981	2,948	12,643	1,929	9,498	3,870.20	13,158	–	–	8,698	3,334	–
1982	1,372	12,166	1,489	13,130	–	12,977	–	–	8,372	4,165	–
1983	904	12,372	1,472	18,127	–	-	–	–	9,387	5,951	–
1985		17,897	–	30,581	–	16,520	–	–	14,343	8,991	866
1987		14,286	–	30,563	–	-	–	–	16,322	11,557	–
1989		12,577	–	28,242	–	16,746	–	–	22,326	14,490	4,857
1990		13,242	–	27,921	–	16,702	–	–	24,592	55,450	4,350
1991		13,438	–	26,058	–	17,647	–	–	28,022	17,058	–
1992		12,025	–	19,651	–	14,479	–	–	–	14,870	–

Note: Yen is converted to US dollar at IMF rate. Production of watches and clocks reached 132.75 millions units in 1980 and 257.35 million units in 1985.

Sources: Economic & Foreign Affairs Research Association. *Statistical Survey of Japan's Economy 1971*. 1978; *Industrial Review of Japan*, 1979-1983. *The Nikkei Weekly*, 23 May 1992; 17 May 1973; Statistical Bureau, Prime Minister's Office, *Statistical Yearbook of Japan 1982-1992*.

Japan's NHK has started broadcasting of high definition colour TV (HDTV) with its own standard. Efforts have been made to get it accepted by the USA, the EC, and other countries as their standard though the USA and the EC were trying to establish their own standard. Recently, some US groups have made an alliance to adopt a single standard for the USA-based digital system. Whatever standard may be accepted, Japan is preparing itself to capture a Lion's share in this forthcoming multi-billion dollar consumer electronics market of the next decades. To protect domestic market, Japan is also pushing ahead a new hybrid (digital and analog) HDTV standard.

Japan is advancing very fast in a comparatively new field of medical equipment production as well. The production volume of medical electronic appliances already reached ¥270 billion (US$1,224 million) in 1981. Development of helical CT Scan system and sophisticated expensive medical equipment, among others, might place Japan in a strong position in the expanding medical equipment market where she is already in with many OEM supplies.

Semiconductor industry

The invention of the transistor in 1947 was expected to replace electronic tubes, the pillar of electronics so far, and as seen now, it really did so faster than expected. Japan's semiconductor industry started with the introduction of technical know-how from the USA. Kobe Kogyo, later absorbed by Fujitsu, introduced transistor technology from the Radio Corporation of America (RCA) in 1952. The Tokyo Tsushin Kogyo, the predecessor of Sony, entered into an agreement with the Western Electric, also for transistor technology in 1953. Tokyo Tsushin Kogyo started selling transistorized radios in 1954, and other major manufacturers also followed in quick succession. In 1958, Japan produced 86.5 million units of transistors and became the world's largest producer.

As to integrated circuits (IC), the Nippon Electrical Company (NEC) obtained an exclusive license for Planar technology, a basic for IC production, from Fairchild of the USA. The IC production started in 1966, but Japan started with the development and production of MOS IC, the manufacture of which is easier than that of bipolar IC dominated by the USA; it also has the advantage of a wider application. This is because of a smaller military demand in Japan. The IC production then grew very fast characterized by rapid technological progress.

Japan that was basically dependent on US semiconductors and related technology in the early 1950's and 1960's has now reached a level at which even the USA is alarmed. Japan's import of IC from the US was ¥23,846 million (US$80.30 million) in 1975; ¥37,684 million (US$127.10 million) in 1976; ¥40,693 million (US$193.40 million) in 1978; ¥74,059 million (US$338.00 million) in 1979; ¥69,567 million (US$306.80 million) in 1980; ¥70,488 million (US$319.60 million) in 1981; and ¥77,000 million (US$320.80) in 1982. Japan's export of IC to the USA was ¥7,033 million (US$23.70 million) in 1975; ¥41,839 million (US$190.90 million) in 1979; ¥72,361 million (US$319.10 million) in 1980; and ¥104,200 million (US$434.20 million) in 1982.[64]

We observed that Japanese exports of IC's to the USA have already surpassed its imports of the item from the country. Excess of export and drastic fall in import of semiconductors by Japan is now a cause of trade friction with the USA which demands a 20% market share at least and further opening to Japanese market. Japan's total annual production of IC reached US$2,590 million in 1981 and US$15,652 million (¥2,263.9 billion) in 1987. The growth thereafter is much more rapid (Tables 3.12a and 3.12b). Japan has been investing heavily in semiconductor related research and development and plant and equipment ever since it entered this field. Initially, her research and development investment was more than the investment in production facilities. It is still introducing advanced foreign semiconductor-related technologies it judges to be important for maintaining its leading position. She introduced 233 cases of advanced foreign semiconductor technology between 1981 and 1984. She introduced 260 cases of such technologies even in 1987; 240 cases in 1988; 242 cases in 1989; 247 cases in 1990; and 261 cases in 1991.

To keep up with the pace of technological advancement and market demand, big Japanese manufacturers are not yet relaxing their investment in plant and equipment (Table 3.12c). The size of investment is still quite large even though a sort of recession now exists. Despite competition from such late comers as South Korea, Taiwan, Malaysia, and renewed pressure from the USA and the EC, Japanese manufacturers are determined to maintain their lead in overall market share.

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[64] Ryuichi Kato. "Electronic Parts & Components", *Industrial Review of Japan. 1983.* pp. 54-55.

Table 3.12b Capital cost of setting up a world-scale semiconductor plant, Japan's plant & equipment investment for semiconductor, comparison of production with USA and Japanese trade in semiconductor.

Unit: US$ million

Year	Minimum plant cost	Plant & equipment Investment in Japan[a]	IC-related R&D in Japan	Semiconductor production			Japan's IC trade	
				Worldwide	USA	Japan	Import	Export
1954	0.1							
1958	0.3							
1959	-			400				
1967	[a]0.5			-		204.0		
1969	-			1,700		348.0		
1970	-			-		472.0	57.2	
1971	-			-		-	67.2	
1972	[a]2.0	32.6		-	2,361	-	54.1	
1973	-	86.3		-	-	-	122.4	9.6
1974	-	85.9		5,400	-	-	175.0	22.9
1975	-	35.6	72.4	-	-	931.3	134.9	45.5
1976	[a]5.0	91.3	82.0	-	-	-	211.6	76.6
1977	-	101.3	92.0	-	4,532	-	207.7	118.0
1978	[a]10.0	171.1	185.0	11,492	6,122	2,490	291.3	248.2
1979	-	326.2	248.0	14,905	8,625	2,930	449.3	494.2
1980	[c]45.0	532.7	319.0	16,915	11,135	3,840	480.1	808.4
1981	[c]50.0	[d]802.5	394.0	19,970	10,900	4,170	518.1	905.2
1982	[b]60.0	1,208.6	522.3	17,675	11,175	5,551	519.7	1,142.7
1983	[c]120.0	2,050.4	682.5	19,935	12,420	8,410	652.0	1,786.6
1984	[c]160.0	3,989.1	824.8	23,920	14,870	12,703	935.4	3,270.3
1985	[c]200.0	2,850.7	1,068.6	29,455	18,515	10,528	693.5	2,439.0
1987	[c]320.0	1,832.1	1,876.4	-	-	17,193	1,125.1	4,095.5
1989	[c]440.0	4,565.8	2,739.2	-	-	26,051	2,123.9	7,982.9
1990	[c]540.0	4,370.8	3,081.7	-	-	25,012	2,483.8	7,247.6
1995	[c]1,200.0							
1997	[c]1,400.0							

Notes: [a] Wafer fabrication only. [b]Total Wafer -assembly cost. [c]Approximated from graphical presentation. [d]Estimates: *Based on survey of 17 firms(1987-90 for IC only). Yen value is converted to US$ at IMF rates.

Source: OECD: *The Semiconductor Industry–Trade Related Issues* . Organization of Economic Cooperation for Development (OECD), 1985, Tokyo, Industrial Review of Japan 1984, The Japan Economic Journal, Tokyo, p. 59.; *Far Eastern Economic Review*, 25 March, 1993.

Table 3.12c. Capital investment and production by five large Japanese semiconductor makers (in semiconductor field only) in 1991 and 1992.

Unit: US$ million

	NEC	Toshiba	Hitachi	Fujitsu	Mitsubishi Elec.
Investment					
1991 (Actual)	100 (783.5)	100 (783.5)	80 (626.8)	160 (1,253.6)	90 (705.2)
1992 (Projection)	80 (630.9)	80 (630.9)	60 (473.1)	80 (630.9)	50 (394.3)
Production					
1991 (Actual))	755 (5,915.5)	710 (5,563.0)	560 (4,387.7)	401 (3,141.9)	375 (2,938.2)
1992 (Projection)	830 (6,545.2)	780 (6,150.9)	580 (4,573.8)	425 (3,351.5)	390 (3,075.5)

Note: Yen value is converted to US$ at $1=¥127.63 for 1991 and $1=¥126.81 for 1992.

Source: *The Nikkei Weekly*, vol. 30, No. 1520, June 6,1993.

As in the USA, EC, and in many other countries, the development and growth of semiconductor industry in Japan enjoyed tremendous all-out support from the government in various forms through general and special programmes and research and development financing. One can say that the Japanese semiconductor policy is more than a success with all its spill-over effects. Entry into this field with all vigour, when it was rather easy and less expensive with and more potential, was a great policy success like so many other sectors of strategical industries that Japan ventured into in time.

Computer and peripheral equipment industry

The rapid technological development of Japan in Very Large-Scale Integrated Circuit (VLSI) has given her additional fighting strength in computer as well as the intelligent robot fields which used to be almost a US monopoly until a decade or so ago. Japan's production of computer and peripheral equipment reached ¥1,009.8 billion (US$4,579.0 million) in 1981. The production level reached about ¥2,270 billion in 1985.[65] The publicized case of the indictment of Hitachi and Mitsubishi employees on charges of espionage of IBM computer secrets in the US is just a solitary instance of the

[65] Naoki Fukuzaki, "Computer", *Industrial Review of Japan, 1983*, p. 52.

seriousness of efforts the Japanese were making to catch up and then to surpass the US computer giants.

Japan has diligently introduced any available superior foreign technology or patents that can put her on the lead. Despite her own advancement in this field, she introduced 1,618 innovations of computer technology from abroad in just four years between 1981 and 1984, and the trend is continuing.[66] Japan has been promoting development of supercomputers, which is going to open a new era for the computer industry in Japan. Despite US pressure on the Japanese government to increase purchase of supercomputers from the USA, mainly from Cray Research Corporation, Japan kept the purchase to a minimum and promoted development of her own, what is called fifth generation computers. Some Japanese makers are now claiming that their newly developed computers are in fact faster than Cray's. The policy of the computer industry has thus served its purpose and shall very likely continue to yield results in Japan's favour.

Telecommunication equipment industry

Japan's telecommunication equipment industry enjoyed a monopoly in its own local market till a few years ago. Criticism continues that procurement by the Nippon Telegraph and Telephone (NTT) is not yet open to foreign competitors in any real sense. Japan's telecommunication technology has attained its maturity under government protection. The NTT has now made technical exchange agreements with IT&T and IBM to take some heat off the criticism against NTT, a public corporation, which has now been privatized by publicly selling out the government's share in phases. The production of telecommunication equipment reached ¥1,253.80 billion (US$5,685.40 million) in 1981. Since the procurement has been officially open to foreign manufacturers in January 1981, procurement of foreign equipment like PBX units and other non-main system equipment was worth ¥13 billion as of the end of 1982.[67]

Japan imported telephone sets from the USA in 1877 for the first time in her history. Japan, however, developed her own telephone set the following year. Japan had 1,080,000 telephone sets before 1945. Due to damage during the War, the number of telephones

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[66] Science and Technology Agency. Indicators of Science and Technology. 1985. Tokyo. p.149.

[67] Michitaka Hirakawa. "Telecommunication Equipment". *Industrial Review of Japan. 1983.* pp 56-57.

decreased to 470,000 in 1945. In 1950, mass production of her No. 4-type telephone and, in 1951, red public telephone started. To promote the telephone service in a modern system, the NTT was established in 1952. The NTT rapidly expanded the telephone service by adding an additional 1,090,000 lines in the 1953-57 plan period; 2,140,000 lines in the 1958-62 plan period; 5,110,000 lines in the 1963-67 plan period; and 5,220,000 lines in the 1968-70 period. The planned target of the 1969-1975 plan period was 19,700,000 lines.[68] The reason why Japan had to protect her local market is obvious. Had she imported the equipment, she could not have increased her communication facilities by even a fraction of what she achieved in the 1950's because of the shortage of foreign exchange that Japan had to face. Japan's telephone lines now are about 42 per 100 persons which compares well with about 52 of the USA, 48 of Hong Kong, 45 of the UK, 34 of Spain, 1.8 of the Philippines, and 9.8 of Malaysia (as of December 1991).[69]

Japan has a big share in the international export market. Under one single contract with Malaysia in April 1981, the NEC secured an order worth US$1 billion for the supply of digital electronic telephone switch system. Now optical fibre communication technology is going to create a new era for the communication industry.

Japan introduced the mobile telephone system quite recently with its own products. Motorola of the USA, which was leading in this field, has however managed to create enough pressure to make Japan accept some of their products. Japanese manufacturers then came out with better and more competitive products. Japan is now contemplating to spread this system throughout the developing world by tying it up with the World Bank, IMF, ADB, and other loans and getting the USA as a temporary partner to create political pressure on the developing countries in encouraging the introduction of the system. It is just a matter of time before Japan would dominate the world market in this field as well.

Heavy industrial machinery and plant engineering industry

The importance of heavy and industrial machinery did not escape the attention of Japan in its early stage of industrialization. In fact,

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[68] Japan External Trade Organization. *Trade and Industry of Japan* . JETRO. Sep. Tokyo, 1971. pp. 4-12.

[69] *Far Eastern Economic Review*. 6 May. 1993. p.45.

the production of industrial equipment preceded many consumer products. Looms and spinning machines were some of the pioneer products. She started producing steam engines as early as 1860 followed by diesel engines, as the shipbuilding industries started picking up. Water wheels were in use from the Tokugawa era. The water-wheels were gradually replaced by steam engines from the time of their introduction in the 1860's. The introduction of the railway in 1872 and its subsequent rapid expansion also called for the production of locomotives. Hydroelectricity has been generated since 1890.

The generation of electricity created a demand for transmission equipment. Japan completed its electrification of factories by 1930 charging a higher rate for domestic consumption and a very low rate for factories.[70] Initial priority was given to industrial use of power rather than domestic consumption. As Japan had always been conscious of domestic production of almost everything by introducing know-how from abroad initially, she did not resort to importing all industrial and heavy machinery necessary for developing the country's infrastructure. Thus, Japan had made considerable progress in industrial machinery production even before the War. The household appliance manufacturing industry developed mainly after the War.

Japan's heavy electrical equipment industry is a vital sector of her industries for building up her own infrastructure as well as to export. The production volume reached ¥2,640 billion (US$11,971 million) in 1981. Japan has gathered substantial technology in the nuclear power industry as well. Japanese companies have arranged technical cooperation with the US and European pioneers in the field. In 1982, Mitsubishi Heavy Industries and Mitsubishi Electric Corporation joined hands with Westinghouse of the US to initiate advanced PWR (nuclear reactor) projects.[71] In another case, Hitachi, Toshiba, and Fuji started a feasibility study on PWR developed by Kraftwerk Union AG of West Germany. Development of her own nuclear technology and hardware appears to be one of the goals of the Japanese nuclear policy.

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[70] Ryoshin Minami, "The Introduction of Electric Power and Its Impact on Manufacturing Industries: with special reference to Smaller Scale Plants" in *Japanese Industrialization and Its Social Consequences*, ed Hugh Patrick, 1976, pp. 300-312.

[71] Takashi Konagaya, "Heavy Electrical Machinery", *Industrial Review of Japan*, 1983, pp. 68-69.

Japan's experience in electric plant operation and accumulated production technology have been put to profitable use since 1960 to launch drive in plant export. Electric plant export usually demands financing backed by government. Japan's huge trade balance gave her the opportunity to allow necessary credit to buyers whenever necessary. Japan's technology supported with heavy machinery production facility and the required finance gave her a competitive edge over the traditional plant exporters of the West. Initially, the engineering firms built up their experience by supplying to the huge domestic market during Japan's investment boom. Later, she started exporting at a nominal profit or with no profit just to gain experience in overseas markets. When sufficient experience was gained by around 1965 in many fields, she launched her real drive for export.[72] Her export of plants reached US$2,372 million in 1972; 2,481 million in 1973; 4,298 million in 1974; 6,024 million in 1975; 8,769 million in 1976; 10,168 million in 1978; and 17,459 million in 1981.

As a strategy to lessen competition and secure larger and larger orders, Japan has recently made agreements with many Western countries to jointly participate in major international tenders for large projects. This shall obviously be detrimental to buyers, but Japan might be able to enjoy better business by bringing her economic and technological power to full play even under unusual international economic and political situations.

Defense industry

Japan's defense equipment building capability is manifested by her launching many wars before World War II. Historically, cannons were cast in Japan as early as 1844 during the Tokugawa regime, and engineering works were established in 1856 for military and naval purposes in southern Japan.[73] Reverberatory furnaces, arsenals, and foundries were built in Satsuma, Saga, Choshu, and also in the Bakufu domain in the 1850's.[74]

To overcome her backwardness in aeronautical field, Japan imported aircraft-related technology from Europe very aggressively (Table 3.13).

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[72] World Economic Information Service. op. cit.. pp. 180-83.

[73] Henry Rosovsky. *Capital Formation in Japan 1868-1940.* The Free Press of Glencoe. 1961. New York. pp. 100-101.

[74] Rosovsky. op. cit . pp. 100-101.

Table 3.13. Import of technology related to aircraft, 1913-1926.

Month	Year	Purchaser	Item (Source)
June	1913	Navy	Renault engine (France)
October	1917	Army	New Paul equipment model 24 (France). right partially provided to Nakajima
June	1917	Mitsubishi	Espagno Suiza (France)
August	1918	Kawasaki	Samson reconnaissance aircraft and engine (France)
February	1920	Mitsubishi	Technological assistance for naval aircraft from Sopwith Corp. (UK)
–	1920	Navy	Lorraine engine (France)
June	1921	Gas and Electricity	Rhone engine of Norm Co. (France)
–	1921	Navy	Technological assistance from Short Co. and Apolo Co. (UK)
May	1922	Mitsubishi	Espagno Suiza Co.. starting device (France)
–	1922	Navy	Avro training plane (UK).right partially provided to Nakajima and Aichi
–	1922	Nakajima	Espagno Suiza Co. Engine (France)
May	1923	Mitsubishi	Avion Co. . plane (France)
February	1924	Kawasaki	Dornier all-metal plane and flying boat (Germany)
May	1924	Mitsubishi	Hertzmark starting device (France)
May	1924	Nakajima	Lorraine starting device (France). right partially provided to Aichi
June	1924	Kawasaki	BMW water-cooled engine (Germany)
September	1924	Aichi	Heinken Co. . hydroplane and flying site device (Germany)
January	1925	Nakajima	Bristol Co. . Jupiter engine (UK)
February	1925	Mitsubishi	Henri Co. . aircraft (France)
May	1925	Mitsubishi	Lead metal propeller (France)
August	1925	Mitsubishi	Rollback Co. . light metal flying boat (Germany)
May	1926	Mitsubishi	Armstrong Co. . engine ((UK)
August	1926	Kawasaki	P. Bourcher Co. starting device (France)

Source: Taro Nakayama. *Japan. A Technology-Based State.* Bangalore. India: UN-ESCAP Regional Centre for Technology Transfer. 1984. p.13.

The postwar defense technology is, however, far more sophisticated than any prewar technology. Even though Japan was

prohibited by SCAP from building up the defense industry in the early postwar years, Japan formed its self-defense force in 1954 after SCAP formally withdrew its direct control in Japan in 1952 on signing the peace treaty in 1951. Japan bought much defense equipment from the US, but she preferred to produce it locally under license whenever found feasible.

Under US protection, Japan did not increase her defense expense beyond a limit of 1% of her GNP. But when the GNP grew fast, the defense budget also grew substantially in absolute amounts (*see* Appendices 1-4). The defense budget of 1982 was worth Japanese ¥2,586 billion (US$10,775 million). Japan's policy of local development of industries is also very visible in this field as well. Japan's domestic production of defense equipment rose to over ¥600 billion in 1981. The value of procurement contract in the 1982 fiscal year reached ¥1,127.50 billion (US$4,697.90 million). The procurement of the F15 fighters and P3C anti-submarine patrol planes started in 1978, but the procurement was not of the finished products. Mitsubishi Heavy Industries was designated by the government's defense agency as the prime contractor for licensed production of McDonnel Douglas Corporation's F15s and Kawasaki Heavy Industries as the prime contractor for licensed-production of Lockheed Corporation's P3Cs. A number of other companies are given subcontracts to manufacture different parts of these crafts.

A project was started in 1981 to domestically develop a new trainer plane code-named XT4, formerly known as the MTX.[75] Ishikawajima-Harima makes the J79 jet engines developed by General Electric Co. of the US and F100 jet engines developed by Pratt & Whitney Aircraft of the US Ishikawajima-Harima developed the XF3 jet engine due to be used in the XT4.[76] Most turbine engines for self-defense helicopters are also made by the company.

Until recently, missiles were either imported from the US or manufactured under license, but Mitsubishi, Kawasaki, and Toshiba are all making their own guided missiles.[77] Tanks have been manufactured for a long time. Japanese electronic technology for defense use is being desperately sought by the USA. Defense technology for

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[75] Osamu Ban. "Defense: Business is Taking Long Stride Along with Defense Buildup Moves". *Industrial Review of Japan, 1983*. pp. 76-77.

[76] Osamu Ban. op cit., pp. 76-77.

[77] Ibid.

exchange agreement has already been signed between Japan and the US. The present US pressure on Japan to strengthen defense coupled with technological exchanges in the defense field has given Japan an unprecedented scope in her postwar era to reshape her defense industry and to finally exploit the vast world market. There is still some opposition to the export of weapons in the Japanese Diet, but it remains to be seen whether Japan shall some day compete with traditional weapon exporting countries of the West, although she is now echoing concern about weapons proliferation and advocating maintaining an international Arms Registrar under UN mandate, or otherwise with other countries. But from all indications, it is very likely that Japan will make it a booming sector of industries in future unless other countries totally stop arms export, which is desirable but very unlikely.

To overcome its deficiency in aerospace technology, Japan is launching serious and ambitious space and aeronautical programmes. She has introduced 109 cases of foreign aerospace technology in just 4 years between 1981 and 1984. Japan was then trying to develop her next generation fighter plane code-named FSX, but the USA was showing interest in joint development of the fighter by modifying her own F-16. The technology sharing was agreed upon, despite occasional disputes about the degree of access. Many US Congress members expressed their anger that it was a 'give away' of US high-technology. There have also been occasional complaints from the Japanese side that the USA unreasonably wants access to technology that is not directly derived from the project. However, as Japan is now in a better financial position than the USA, it is likely that US companies would provide their aerospace and defence technology to Japan. Now the General Electric (GE) of the USA has agreed to provide the technology for its F110GE129 jet engine for FSX to IHI (Ishikawajima-Harima) of Japan, subject to US government approval, which is already developing and manufacturing 8.5% of the GE90 engine.[78] The Pratt & Whitney has allowed Mitsubishi Heavy Industries a 10% (US$75-110 million in addition to US$75 million paid every year since 1991. Mitsubishi is now earning ¥20 billion a year from participation in its manufacture) participation in PW4000 jet engine development and manufacture. Kawasaki Heavy Industries of Japan has a 2.9% share in the

[78] *The Nikkei Weekly*, May 24.1993: p.9.

development and manufacture of Rolls Royce TRENT 800 engine[79]. With a huge trade surplus and a strong Japanese yen, Japan is definitely at a financial advantage to buy the necessary technology now. There is no reason why the Japanese companies should not take advantage of this situation to meet their technological gap in this prospective and Japanese government priority field. It will be of interest to the world to see how far and how fast Japan really goes in this field.

TRADING SECTOR

Japan has a long tradition of trading through mainly *Sogo shosha* (General traders). There are many big trading companies. Japanese trading houses have their offices almost all over the world. The annual sales volume of the top nine trading companies is more than the government budget, or even the GNP of many developing countries (Table 3.14). The USA is promoting similar trading companies to expand its export. Sears, Roebuck and Co. of the USA had already applied to the Bank of Japan in April 1983 for permission to open an all-round trading house in Tokyo.[80] It is yet to be seen how successfully it can emulate Japanese *Sogo shosha*. The third country trade by the Japanese companies, backed by Japanese banks advancing into the international finance market, may be a big source of income for Japan in this powerful service sector. With enormous Japanese investment overseas, the trading houses are going to wield enormous influence on the developed and the developing countries. Hardly anything is there that they do not handle. In spite of occasional trade friction with the USA and the EC, they do not seem to notice that more than 20% of their own trade is handled by the Japanese *Sogo shosha*.

As Japan was expanding her official development assistance (ODA), the trading houses found a new role of handling most of the deals involving ODA. In this course, many of the biggest trading houses were involved in bribing top foreign government officials to secure business profitably. Many such cases were already surfaced in a number of countries.

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[79] *The Nikkei Weekly*. May 17,1993: p.8.

[80] *The Japan Times*. April 8. 1983. p. 7.

Table 3.14. Sales of Japan's nine Sogo shosha in 1991.

Company rate	Total annual sales		Exports		Imports	Offshore
	(US$ M)	(¥ B)	In Japan (¥ B)	from Japan (¥ B)	into Japan (¥ million)	trade (¥ billion)
Itochu	148.556	20.012	9.950	2.041	2.057	5.965
Sumitomo	139.396	18.778	8.816	2.947	2.820	4.194
Marubeni	135.409	18.241	7.810	2.397	2,506	5.527
Mitsui	119.991	16.164	7.243	2.299	2.816	3.806
Mitsubishi	116.539	15.699	7.202	2.607	3.014	2.876
Nissho Iwai	81.033	10.916	4.102	1.095	2.632	3.088
Tomen	53.864	7.256	3.292	794	1.157	2.013
Nichimen	46.121	6.213	2.791	459	499	2.464
Kanematsu	43.946	5.920	1.544	1.000	2.509	867
TOTAL	884.856	119.199	52.750	15.639	20.010	30.799
Share (%)	100 0		44.3	13.1	16.8	25.8

Note: Japanese yen value has been converted to US dollar at $1=¥134.71

Sources: Keizai Koho Center. Japan 1933. *An international comparison.* p.45.

Undoubtedly, these trading houses (prewar *Zaibatsu* group) contributed to the economic development of Japan for many years, but it is also very likely that they might effectively influence the ODA receiving governments if they themselves are not cautious and nationalistic enough. It is yet to be seen how they use their economic muscle and influential links in the future to curb their role in changing global situation.

FOREIGN INVESTMENT

Japan tactfully kept foreign investors out of her market until local industries or companies grew strong enough. But once she is in a position to invest outside, she is doing it rapidly and with process to gain both her secured supply of raw materials as well as an invisible income. Japan's total direct overseas investment between 1951 and 1968 was just US$2,007 million, but it started rising annually. The investment was US$665 million in 1959; US$904 million in 1970; 2,338 million in 1972; US$3.280 million in 1975; US$4,693 million in 1980; and US$8,906 million in 1981. As of 1981, her total direct

overseas investment reached US$45,403 million, and the cumulative figure rose to US$352,392 million in 1991. Japan wants to invest in the countries having natural resources, stability and potential, or existing markets. By 1981, she had already invested US$11,207 million in the US, US$6,858 million in Indonesia, US$3,224 million in Brazil and US$2,512 million in the UK.[81] The other countries where she invested substantially are Hong Kong, Panama, Liberia, Australia, South Korea, Singapore, Canada, Iran, Mexico, the Philippines, Malaysia, the Middle East and the EC countries.

Although Japan was under SCAP for a number of years after the War, she managed to keep herself free from undesirable foreign investment. The foreign investment in Japan in 1949-50 was merely US$3.15 million when Japan was still under SCAP control. It was just US$188.55 million in the entire period between 1951 and 1955. The total foreign investment in Japan during 1951-1991 was only US$22,771 million, as against her own investment of US$ 67,540 million in just 1989 (Table 4.6). The West might have been surprised at the size and speed of Japanese overseas investment. Japan never wanted foreign investment in her internal vital sectors.

As to the policy of allowing foreign investment in Japan, particularly in industry, Saburo Okita who was involved in postwar development planning and the famous income doubling programme, and was also the foreign minister in the 1989 cabinet (since November 1989) rightly elaborated the underlying philosophy as—

> "... our government and our business people very carefully studied the industrial field, searching for those industries with future potential, those in which we would have a comparative advantage in the world market, and determined the type of support that should be extended to these industries in their formative years."

Okita cited the automobile industry as one such example: "The government closed the door to foreign firms who wanted to invest in the industry in Japan. The policy, simply, was that the automobile industry was a promising field and therefore, until our industry became competitive, no foreign investment should be allowed in that sector. If we had allowed foreign investment too early we would not have developed the sound footing we have in the industry today." [82]

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[81] Japan Institute for Social and Economic Affairs. *Japan 1982* (Tokyo: Keizai Koho Center. 1982). p. 44.

[82] Okita, op. cit., pp. 96-97.

OUTLINE OF THE GROWTH PATTERN

While Japan is expanding its GNP, increasing its exports, developing technology, and investing overseas, she has also been further developing and improving her infrastructure steadily in recent years. Government uses the physical infrastructure and construction investment to vitalize her domestic economy when there is an international recession. In the course of developing an infrastructure, she produced world's fastest railway system in the 1960's. Japan's development and use of the bullet train was a record achievement in the railway history of the world. She is planning a linear motor system to be operated at about 500 km/hour. Japan's railway technology is being sought by the USA and other countries. She may make a big overseas business out of its railway technology as well.

In the course of study of the sectorwise development of Japanese industries, it is already observed that all the sectors' growth patterns have some similarity in their high rates after the initial warm-up. All sectors have shown their capacity to diversify before reaching a saturation point in any one field. All the sectors managed to diversify because of fixation of targets in advance, without which a discontinuity could appear in the growth pattern and many more companies would have been thrown out of business long ago. This target fixation could not always come from the research findings of individual companies, particularly the smaller ones. Direct or indirect government help in targeting, promotion of and research in new lines of business appears to have played a major role.

This type of industrial 'targeting' was openly criticized in Tokyo on 30 March 1983 by Sam M. Gibbons, Chairman of the Trade Committee of the US House Ways and Means Committee, as "unfair", and he warned that the US Congress might introduce legislation to penalize the GATT violators. He said that some of the Japan's targetting policies violate GATT. As such, the legislation would be "within the countervailing duty" against unfair trade practices as defined in GATT and in US statutes.[83] It is doubtful whether the US action will influence basic Japanese policies or strategies. It is also difficult to substantiate such charges accurately as many big companies are now capable of financing their own

[83] *The Japan Times*. March 31, 1983, p. 1.

research in this field. In any case, industrial advance planning kept the Japanese industries booming, and they shall not be left without a fixed course ahead to follow in future.

A recent survey conducted by *Nihon Keizai Shimbun* shows biotechnology, robots, optical fibre communication, computer usage technology, new industrial materials, office automation equipment, semiconductors, laser products, defense hardware, nuclear energy, and so on are already considered to be the growth potential areas. Some of these fields are already growing rapidly.[84] As long as Japan is successful in finding new areas of potential growth and can exploit them ahead of other competitors, Japan might be able to maintain her economic health.

Japan's industrial growth, which is mainly responsible for her economic development, was quite broad-based and massive. The wide spectrum of high technology may thus give Japan her new industrial revolution if the international environment remains favourable or can be manoeuvred favourably. Japan is always conscious of her position and seems to be acting accordingly.

[84] Nihon Keizai Shimbun. *Industrial Review of Japan. 1983.* p. 44.

Chapter 4

MEIJI RESTORATION AND PRE-MEIJI SOCIAL BACKGROUND

The rapid and massive postwar economic development of Japan prompted researchers to study the Meiji period to find possible causes of her current development. It is commonly accepted that modern Japan started with the Meiji Restoration in 1868. But there may remain a question as to why changes could start at that very period, or whether changes really started at that time at all. So some background of the Meiji Restoration and the social conditions in the period prior to the Restoration are given here for better understanding.

The Meiji Restoration refers to the restoration of the authority of the Emperor over Japan in 1868. This occurred after the fall of the Tokugawa Shogunate which had exercised central power since 1603 by establishing its headquarters in Edo (Tokyo). The Tokugawa era was preceded by feudalism (1185-1603) in which the emperor could not have any power other than endorsing the rule by the feudal lords. The Tokugawa Shogunate was established by three illustrious military leaders, each carrying on where his predecessor had left off.[1] The first was Nobunaga Oda (1534-82), who committed suicide after he was wounded by the force commanded by one of his vassal barons. Nobunaga was succeeded by his General Hideyoshi Toyotomi (1536-98), who invaded Korea in 1592. The third leader, Iyeyasu Tokugawa, took over after Hideyoshi's death and carried the process of establishing the central authority by defeating all his rivals in 1600. Iyeyasu assumed the title of *Sei-i-tai Shogun* in 1603,

[1] Ike, op. cit., pp. 10-12.

later endorsed by the emperor.[2] The Shogun or the military ruler brought about a number of institutional reforms to avoid civil war common in the past. He established his rule through *daimyos* of his confidence, who had to spend a certain amount of time every year in Edo and leave behind their families as hostage under a system of "alternative attendance".[3] The coming and going of the *daimyos* along with their entourage created a scope for business in Edo and along the routes of their movement.

From the time Portuguese sailors landed by accident on the shores of Tanegashima in 1543, European culture had an influence on subsequent Japanese history.[4] By 1615, Portuguese missionaries stationed in the Kyushu area had converted some 300,000 Japanese to Christianity. Many Japanese looked upon the converts as a potential threat. A few incidents of rebellion left most of the defending Christians killed.[5] Around this period the Dutch, the Portuguese, and the Spanish were exploring the world for discovery, trade, or colonization. The incidence of Christianity alarmed the Tokugawa government which finally closed all trade with almost all the foreign countries in 1639. Only the Dutch, who were not Catholic and more reasonable, and the Chinese were allowed a limited access for business only at the designated port of Nagasaki in Kyushu.

Another theory indicates that relations with Korea and Ryukyu were also maintained, and windows other than Nagasaki were open for foreign contact after 1639.[6] With these exceptions, the period of *Sakoku* (isolation) began in 1639. The Japanese were compelled to live on their own resources. During the period of isolation, Japan had little information about the scientific progress in the West except through the Dutch business mission. But steel vessels operated by steam power were already in use in the West. They had comparatively improved fire arms as well. The industrial revolution created powerful merchant groups in Europe who were restlessly moving overseas to find a market and other benefits, or privileges abroad.

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2 Ibid.

3 Ike, op. cit., p. 10-12.

4 Tashiro Kazui, "Foreign Relations During the Edo Perios: Sakoku Reexamined, *Journal of Japanese Studies*, 8:2, 1982, pp. 286-87.

5 Ike, op. cit., pp. 10-12.

6 Kazui, op. cit., pp. 284-85.

From about 1790, vessels representing a variety of nations like great Britain, France, Russia, and the United States sailed into Japanese ports to persuade the Japanese change their policy of isolation. They were treated "politely, given water and provisions, and told firmly to go away."[7] Commodore Matthew Perry's mission which arrived in 1853 was, however, successful in achieving the breakthrough and making an agreement to open Japan to foreign trade in 1854. Probably the news of the Chinese defeat in the Opium War of 1839-42 influenced the Japanese decision.[8] At that time financial and leadership problems in the Tokugawa house also worked against any bolder step. Some uprisings were surfacing against the Tokugawa regime, but despite some violence for several months, a continued civil war was averted by restoring the power of the Emperor in 1868. The Tokugawa family was eventually given titles and made a part of the new nobility.[9]

The government of the sixteen-year-old emperor Meiji started making bold and sweeping reforms in almost all fields to achieve their goal of *"rich country and strong army"* under a modernized system.[10] William W. Lockwood has likened this modernization after 1868 to the bursting of dam releasing "long-pent-up forces".[11] Under about 250 years of the quasi-feudal Tokugawa regime, the people's creativity had little chance of exposure to tackling the challenge of reality. The intellectual Samurai bureaucrats took this opportunity to face the foreign imposition of unequal treaties and other interference by foreigners with determination. It is understandable why the Meiji government objectives were so clear from the beginning, although it had not till that point consolidated its power free from all challenges. This slogan of "rich country and strong army" was, in all probability, the voice of the people, not so much against the Tokugawa regime as for nationalism. The disarming of the long-established Samurais who comprised 7% of about 30 million population, stopping their stipends, changing agricultural tax from rice to cash, introduction of compulsory education, changing monetary system and bringing about a number of social and eco-

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[7] Ike. op. cit., p. 19.

[8] Ike. op. cit., p. 19.

[9] Ibid., p. 20.

[10] Ibid., p. 21.

[11] William W. Lockwood. *The Economic Development of Japan.* expanded ed., Princeton University Press, 1968. New Jersy, p. 5.

nomic institutional changes in a matter of a few years, were definitely colossal tasks and prerequisites for Japan's entering the modernization process.[12]

Modernization at that time meant going closer to Europe in standard or simply "Westernization". For Japan, which "as recently as the early nineteenth century remained in a stage of economic development hardly more advanced than that of Western Europe in the late Middle Ages", modernization in 1868 was probably a revolution out of a revolution, if not a revolution for a revolution.[13] However, had the Meiji Restoration had not been an outcome of a revolution, backed by a scholarly nobility, it would be doubtful whether calculated moves to modernization would have been possible. The reforms were not based on the whims or uneducated emotions. Vigorous studies were undertaken by the leaders in the government and scholars outside the government to take the intellectual lead to direct the national policies. Westney rightly cited Hugh Byas and Kozo Yamamura to describe the situation:

> Never has any government sent a nation to school, and accompanied it there with greater efficiency... Englishmen organized the navy. Americans created a modern educational system. A Frenchman codified Japanese law. Germans directed the whole of medical education. An Englishman reformed the mint and gave Japan a uniform currency. Post, telegraphs, the army, the land survey, sanitary reform, prison reform, cotton and paper mills, improved mining method, harbor works, modern shipping and navigation—all were the creation of foreign advisers. To argue that Japan Westernized and sought replicas of Western models is to misjudge the scope and depth of Japanese modernization... Japan modernized in a Japanese way.[14]

The government adopted the policy of appointing foreigners in special jobs, and training students and government officials abroad in specific fields. Table 4.1 shows that the government had employed 385 foreigners of different nationalities in 1872. The number went up to 2,447 persons during 1876-85. The number was 1,969 persons during 1886-95. While foreign employees were decreasing, Japan was sending larger and larger numbers of students and

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[12] Takahashi, op. cit., pp. 18-20.

[13] Lockwood, op. cit., p. 3.

[14] D. Eleanor Westney, "The Emulation of Western Organizations in Meiji Japan: The case of the Paris Prefecture of Police and the Keishicho", *Journal of Japanese Studies*, vol. 8: 2, 1982, p. 307.

Table 4.1. Foreign employees in Japan by nationality, training of Japanese abroad and passports issued for given destination.

Nationality	Foreign technical persons employed by Japanese government			Officials and students sent abroad	Accum. passports issued for destination
	1872[a]	1876-85[b]	1886-95[b]	1868-1895	
UK	169	1.247	969	895	2.545
Germany	9	313	312	204	577
USA	41	274	309	432	12.757
France	67	263	97	707	1.061
Russia	-	-	-	164	11.269
China	51	102	64	420	9.509
Italy	-	61	64	68	139
Netherlands (Holland)	17	69	32	-	-
Austria	-	30	25	-	-
Korea	-	-	-	856	36.718
Other	31	88	97	647	50.647
TOTAL	385	2.447	1.969	4,393	125.222

[a]Takao Tsuchiya "*Role of Europeans and Americans in the Establishment of capitalism in Japan*", Keizai-Shutaisei Koza (in Japanese). vol. 6, pp. 270 and 283. as referred to by Koichi Emi. [b]*Taikoku Tokei Nenkan*, vols. 1-15 as referred to by Koichi Emi.

Sources: Koichi Emi, *Government Fiscal Activity and Economy Growth in Japan 1868-1960*, Economic Research Series No. 6. Kinokuniya Bookstore, 1963. Tokyo. pp. 116-124.

officials for studies abroad. Foreign technicians were employed in such fields as railroad, lighthouse, language, shipbuilding, telegraph, medical science, machinery, silk mill, military, architecture, surveying, taxation, mining, and so forth. Government spent a large sum of money for adopting modern civilization.[15] The payment made to foreign employees of the government alone was ¥3,160,000 in 1968-72; ¥7,906,000 in 1873-77; ¥3,774,000 in 1878-82; ¥2,577,000 in 1883-87; and ¥2,522,000 in 1888-92. The expenditure for sending students and officials abroad by the government was ¥1,535,000 in 1868-72; ¥702,000 in 1873-77; ¥1,308,000 in 1878-82; ¥1,231,000 in 1883-87; and ¥1,294,000 in 1888-92. The total government expenditure towards payment to foreign employees and training of the Japanese abroad was as high as 5.92% of the total expenditure in the ordinary account of the central government in 1868-72. This ratio was 2.67% in 1873-77; 1.73% in 1878-82; 1.23% in 1883-87 and 1.19% in 1888-92.

[15] Koichi Emi, *Government Fiscal Activity and Economic Growth in Japan 1868-1960*, Economic Research Series No. 6. Konokuniya Bookstore. 1963. Tokyo. pp. 116-123.

One might wonder how the Japanese economy and social condition could support such a massive programme of modernization. In comparison with many Asian countries, Japan had already a high rate of literacy during the last part of Tokugawa regime. G. C. Allen estimates that nearly half the males and 15% of the females at that time had received or were receiving some kind of systematic education.[16] Allen further says: " The total school attendance of commoners in the temple schools (*Terakoya*) amounted to 1,100,000. The majority of the Samurai and many merchants were completely literate."[17] Many scholars, who studied Dutch, had maintained their high scholarly level even during the Tokugawa period of isolation". Between the time of the opening the country in 1854 and Meiji Restoration in 1868, the introduction of Western thought had already gone a long way. Private scholars like Mori Arinori, who returned from America in 1873, contributed in propagating Western thought through lectures and the publication of a magazine, *Meiroku Zasshi.*

In the field of economy, the Tokugawa regime had proved its innovative ideas in handling its economic affairs. The frequent debasement of gold and silver coins and the introduction of copper coins to respond to economic crises were not simple ideas at that time. The promissory note (*Tegata*) issued by money lenders were widely used for business transactions and money orders among themselves.[18] *Tegata* still plays a prominent role in the Japanese business world.

The raw silk, once used to be imported from China, became one of the most important export items of Japan during and after the Tokugawa era and continued to dominate during the Meiji era, though its share in percentage decreased due to the expansion of the overall economy and development in other textile industries.

During the Tokugawa period, merchant groups were growing rather rich. The *daimyos* would sometimes take loans from them, and they used to enjoy privileges. As the overall economy was not large, the merchants could not invest their money in production.

The self-reliant economy imposed by the Tokugawa regime naturally kept the consumption at a very low level. During the

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[16] Allen, op. cit., p. 2.

[17] Ibid.

[18] Toyoda Takeshi. *A History of Pre-Meiji Commerce in Japan.* Kokusai Bunka Shinkokai, 1969, Tokyo, p. 87

Tokugawa period, the population was stabilized at somewhere between 27 and 30 millions. As Ike points out: "This was probably achieved through openly practised abortion and through infanticide, which was referred to as *mabiki*, a term used to indicate the thinning out of young shoots in a newly seeded field."[19]

Unlike recent days, there was no international loan giving agency. Over and above, Japan followed the policy of isolation and self-reliant economy during the Tokugawa period. Many artisans thus grew up to make swords and other requirements. Paper used to be made in cottage industries.

The question as to how Japan could enter modernization and how far she was equipped to support its modernization may now be answered from the facts discussed above. Whether the situation was ideal or not, there was no big negative factor to work as an obstacle to her modernization. As Allen says: "The ground had been prepared for further advances."[20] So, it is quite reasonable to think that the root of modern Japan extend deep into the Tokugawa era as well. Had Japan been colonized, nobody could say exactly what Japan would have been today, and this may be an academic question. From the example of other Asian countries, the Tokugawa regime's policy of isolation might have had some positive elements for Japan.

PREWAR ECONOMIC DEVELOPMENT PROCESS

Controversy exists as to whether manufacturing started before the Meiji period, but it seems to be more in nomenclature rather than in the fact of production. Some researchers claim that the closed economy of the Tokugawa period was at the petty industry stage in its infancy.[21] Again Sumiya and Taira quote Hattori Shiso as saying:

> In 1833, in the Tokugawa era, before the opening of Japan to foreign commerce, the Japanese Economy was already at the stage of "manufacture in its strict meaning". If Japan had not reached this fairly advanced pre-industrial stage... it would have been as difficult for Japan as for China to take advantage of the newly opened opportunity for trade with advanced capitalistic countries and to transform itself into a capitalist economy rapidly.[22]

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[19] Ike, op. cit., p. 14.
[20] Allen, op. cit., p. 2.
[21] Sumiya and Taira, op. cit., pp. 274-477.
[22] Ibid.

Despite differences in exact wording in describing the industrial situation in the Tokugawa era, towards the end of the era agriculture was in a position to support the domestic cottage industries. The capital, however small it may have been, started accumulating in the hands of the merchant groups. The education that can generate entrepreneurship was already there. The population was at a manageable level. Cheap and disciplined labour was available in large numbers. The Samurais had the courage and quality of leadership to venture into challenging jobs once they were asked to undertake them, or were encouraged to do so. The Meiji era that started with this background was definitely in a position to take up modernization as a strategy to safeguard their independence, or even to establish their own domination of foreign power if possible someday.

Westernization of institutions and industrialization were the main guidelines of the Meiji policies. While the private capital was still not invested due to uncertainty in the beginning, the government took initiatives to invest directly in various industries and infrastructures. As it is seen even now in most of the developing countries with mixed economies, direct government management of industries generates corruption and lacks efficiency. Japan was not an exception. But Japan, after making some vital investments necessary to serve as the harbinger of industrialization, made necessary shifts in industrial policies to create an atmosphere for initiation and expansion of industries in the order of the most calculated priorities she could fix within her limitation of resources. The process involved various difficulties as well.

Rise of Modern Industrial Policy

After a decade of direct governmental investment in mines, railroads, arsenals, and factories, the Meiji leaders confronted unpleasant facts that the new government of Japan could not afford to continue what it had been doing. The side effects of its policies were inflation, trade deficits, corruption, and looming bankruptcy.

Again, Japan did not obtain tariff autonomy until 1890 (officially 1911) as per the treaties Japan was forced to conclude after its first contact with the West. That meant that Japan was not able to aid its developing industries by protective duties and other practices recommended by market-oriented theories of the time. The Meiji government consequently concluded that it had to participate directly in

the economic development if Japan was ever to achieve economic independence. The problem of maintaining a favourable international balance of payments was growing alarmingly and drawing serious attention of the government. As Chalmers Johnson, quoting Tiedemann, puts it:

> "As early as the 1880's... in order to keep foreign payments in balance with customs receipts, all agencies were required to prepare a foreign exchange budget as well as their normal yen budget."[23]

Such a foreign exchange budget managed to continue in some form or the other until 1964 when trade liberalization was carried out to ease criticism against Japan's overexport while protecting the home market.

Meiji Japan began to shift away from mainly state entrepreneurship to collaboration with privately owned enterprises, favouring those enterprises capable of rapidly adopting new technologies committed to the national goals of economic development and military strength. From this shift developed the collaborative relationship between the government and big business in Japan, which managed to survive some occasional unfavourable situations, and is still one of the biggest strengths in the very structure of the Japanese economy that is enviously and somewhat rightly termed as "Japan Inc." by the Western critics.

Liberal economists of the time, such as Taguchi Ukichi, who wrote for the Tokyo economic Journal, urged the government to control inflation by selling off its state enterprises to private companies. The response of the government was positive; the Minister of Finance, Matsukata Masayoshi, issued on 5 November 1880 his famous "Outline Regulations for the Sale of government-operated Factories." The government sold to private groups its factories and pilot plants at a nominal cost, provided them with exclusive licenses and other privileges, and often provided them with part of their capital funds, and encouraged them to accumulate capital for investment in selected industries. As a result of government policies of promotion and encouragement, business started organizing itself and many Japanese industrial and trading giants, now dominantly competing in the world market, had their birth and nourishment in this Meiji period or in the period very close to it. Table 4.2 shows that the Japanese textile giants Toyobo and Kanebo were established in

[23] Johnson, op. cit., p. 25.

1882 and 1887. One of the paper industry pioneers, Oji Paper, was established in 1873. One of the biggest Japanese cement industries, Onoda Cement, came to business in 1881.

Table 4.2. Some important private Japanese companies that have been growing and contributing to development since before World War II and early postwar period.

Major companies	Year of establishment	Capital ¥M (1971)	Major prod. and field of activities
Shimizu construction	1804	16,000.0	Construction and building
Kajima Corporation	1840	24,000.0	" "
Taisei Construction	1873	15,800.0	
Toyobo	1887	13,160.0	Textiles, fibers, etc.
Oji Paper	1873	7,832.7	Paper & paper products
Mitsubishi Paper	1898	5,600.0	" "
Onoda Cement	1881	20,000.0	Cement, asbestos products,
Osaka Yogyo	1882	720.0	Fire bricks
Danto	1885	1,000.0	Tiles
Nippon Asbestos	1896	2,100.0	Asbestos yarns, boards packings
Shinagawa Fire Brick	1903	2,100.0	Fire Bricks
Noritake	1904	3,300.0	Chinawares, crystal glass, etc.
Sumitomo Cement	1907	10,000.0	Cement
Asahi Glass	1908	28,800.0	Flat glass, soda, fertilizer
Nihon Cement	1912	10,500.0	Cement
Tokyo Gas	1885	50,700.0	Gas & gas products
Nippon Oil	1888	22,500.0	Oil refining
Osaka Gas	1897	43,750.0	Gas & gas products
Tobu Railway	1897	13,635.9	Railway service
Hanshin Electric Railway	1899	6,312.5	" "
Nishi Nippon Railroad	1908	7,500.0	
Keisei Dentetsu	1909	13,500.0	" "
Seibu Railway	1912	7,221.7	" "
Nippon Yusen (NYK)	1885	30,000.0	Shipping
Mitsubishi Heavy Ind. (as Tosa Kaisei Shosha)	1870	100,457.7	Ships, aircraft, automobiles, Heavy machinery, arms, etc.
Tokyo Shibaura Electric (Toshiba)	1875	92,552.7	Heavy electric equipment, Home appliances machinery,etc.
Ishikawajima Harima Heavy Ind.(IHI)	1889	38,581.1	Ships, aircraft, industrial machinery
Kawasaki Heavy Ind.	1896	28,000.0	Aircrafts, arms, heavy machinery

(Contd.)

Table 4.2. ***(Continued)***

Furukawa Electric	1896	15,000.0	Non-ferrous materials, cables
Nippon Sharyo Seizo	1896	3,100.0	Railway equipment, rolling stock
Sumitomo Metal Ind.	1897	82,976.0	Special steel, nuclear fuel plant, etc.
Okuma Machinery	1898	4,000.0	Textile machinery, machine tools
Nikkei Aluminium	1899	3,030.0	Aluminium and alloy processing
Kobe Steel	1905	76,154.0	Steel, non-ferrous metals, Machinery, plants, etc.
Howa Machinery	1907	4,000.0	Textile machinery, machine tools
Daihatsu Kogyo	1907	18,300.0	Machinery and automobiles
Nigata Engineering	1910	9,500.0	Marine equipment, heavy machinery, etc.
Nippon Kokan	1912	76,384.0	Steel products, plants, ships
Mitsui Shipbuilding &	1917	20,200.0	Ships machinery and plants Engineering .etc.
Hitachi	1920	122,112.2	All machinery, plants, electric/electronic devices,
Fuji Electric	1923	20,800.0	Heavy electric machinery, atomic energy equipment, etc.
Toyo Kogyo	1920	25,704.0	Automobiles, machine tools, etc.
Suzuki Motor	1920	12,000.0	Motorcycles, Automobiles, etc.
Nissan Motor	1933	41,060.8	Automobiles, rockets, missile,
Showa Aircraft Ind.	1937	496.0	Aircraft, parts, etc.
Isuzu Motors	1937	25,000.0	Heavy vehicles cars, engines
Toyota Motor	1937	42,240.2	Various automobiles, equipment
Hino Motors	1942	12,480.0	Heavy Vehicles, buses, etc.
Honda Motor	1948	18,180.0	Motorcycles, Engines, Automobiles, etc.
Oki Electric Ind.	1881	11,371.9	Telecommunication equipment, semiconductor, computer, electronic equipment and components.
Nippon Electric (NEC)	1899	40,000.0	" "
Matsushita Electric	1918	45,750.0	" "
Sharp	1912	11,550.0	Electronic equipment & system
Sony	1946	5,047.0	" "

(Contd.)

Table 4.2. ***(Continued)***

Nippon Seiko (NSK)	1916	7.350.2	Bearings & precision equipment
Koyo Seiko	1921	7.617.6	" "
Toyo Bearing	1927	5.780.0	
Yokohama Rubber	1917	5,384.0	Rubber products. tires. belts
Bridgestone Tire	1931	10.000.0	" "
Konishiroku Photo Ind.	1873	5.000.0	Camera. photo film. copying
Olympus Optical	1919	2.310.0	Camera. microscope. etc.
Fuji Photo Film	1934	11.022.2	Film. camera. etc.
Canon	1937	7.050.0	Camera. laser printer. office equipment. copy machine. etc.
Shionogi	1878	7.290.0	Drugs. chemicals
Fujisawa Pharmaceutical		4.000	" "
Takeda Chemical Ind.	1907	28.800.0	Beer. wine. etc.
C. Itoh	1858	20.539.6	General trading
Itoman	1883	2.400.0	" "
Kanematsu-Gosho	1889	5.600.0	
Nichimen	1892	7,500.0	
Mitsui Bank	1876	28.000.0	Banking & financing
Tokio Marine & Fire Insurance	1879	20.000.0	Non-life Insurance
Fuji Bank	1880	50,400.0	Banking & financing
Sumitomo Bank	1895	50.400.0	" "
Industrial Bank of Japan	1902	32,000.0	

Note: Ordinary and special papers used to be made in cottage industries and some special papers are still made by some tradition loving artisan; Original names were slightly different in case of some companies.

Sources: The Oriental Economist. *Japan Company Directory 1972*. Tokyo. 1972.

Tokyo Gas was established in 1885. The big Mitsubishi Heavy Industry was established as Tosa Kaisei Shosha in 1870. Tokyo Shibarua Electric (Toshiba) had its origin in 1875. Oki Electric Company, a pioneering telecommunication equipment maker, was established in 1881. Even the banks like Mitsui Bank and Fuji Bank were established in 1876 and 1880.

Besides these organizations, all major construction companies, textile, paper, cement, ceramic, steel, shipbuilding, machine, light and precision equipment industries, banks, trading companies (some of which were later known as *Zaibatsu*), transportation companies

and other organizations now contributing to the Japanese economy had their origin in the Meiji era, or in the period close to it, but not in the postwar period as many people might be inclined to think. In 1871, joint-stock companies were formed for the first time, totalling 1,279 by 1885 with, a capital amounting to ¥50 million.[24]

To formalize and supervise the sale of government property and unify all government economic activities including agriculture, promotion of exports and so on, two of the Meiji oligarchies, Ito Hirobumi and Okuma Shigenobu, convinced the throne of the desirability of a new economic ministry, which led to the creation of the Ministry of Agriculture and Commerce (MAC) on 7 April 1881. Attending to agriculture was the most important activity of this new ministry because of the special role of agriculture and silk which was thought to be a god-sent product without which it might never have brought its trade deficit under control. Concern for economic reform was also reflected from the fact that this ministry was charged with the administration of all laws and orders relating to commerce, industry, technology, fishing, hunting, merchant shipping, inventions, trade marks, weight and measures, land reclamation, animal husbandry and veterinary affairs, forests and the postal service. It combined functions that had been divided since the restoration among the ministries of Finance, Civil affairs, Industrial Affairs, and Home Affairs. The MAC was the real predecessor of MITI (Ministry of International Trade & Industry) of today, which had been steering Japanese economic development.[25]

The Minister of Finance, Matsukata Masayoshi, launched a deflationary policy primarily to bring import and export under control and to keep the government solvent. The whole banking system was streamlined to render effective and specific service. As Chalmers Johnson, quoting Arthur Tiedemann, points out:

> By all means, Matsukata deflation accomplished its objectives. After 1881 interest rates, wages, and prices fell. By 1882, imports were down 6% and export up 33% compared with 1880; there was an export surplus of ¥8.3 million. The cumulative trade surplus for 1882-1885 amounted to ¥28.2 million. By 1885, the paper currency

[24] Yoshihara Kunio. *Japanese Economic Development.* Oxford University Press. Oxford in Asia Paperbacks. 1979. Tokyo. p. 5.

[25] MAC was split in 1925 and MCI - Ministry of Commerce and Industry - was created. MCI was transformed into Ministry of Munitions in 1943 just to be MCI again in 1945 and to continue as such until it was finally reorganized in 1949 as the present MITI.

> had been reduced to ¥118.5 million and the paper silver ratio stood at 1.05 to 1.00. The following year, in the midst of the greatest export prosperity Japan had ever enjoyed, the country went on the silver standard.[26]

When Japan won the Sino-Japanese War (1894-95), she "obtained war reparations from China"[27] and ready access to high quality Chinese iron ore. At the inspiration of the oligarchies and the military to develop iron and steel industry for catering to the needs of armament, the MAC got a bill for ¥4 million iron and steel plant passed in 1896. The plant, Yawata Works, near the coal field of northern Kyushu and the Japan sea went into production in 1901—producing about 53% of the nation's pig iron and 82% of its rolled steel. Then came up the private Kobe Steel in 1905 (incorporated in 1911) and Nippon Kokan in 1912.

The government played an active role in building up an infrastructure across the country. The railroad, which started with an 18-mile line between Tokyo and Yokohama in 1872, was extended to 212 miles by 1885. Government-operated railroads increased to 4,775 miles in 1911. At government encouragement, private railroads of 1,400 miles were established by 1911. About 1,800 privately-owned steamships amounted to 1,375,000 tons in 1911. The electric power supply began in 1900 with the capacity rising to 322,000 kwh in 1911.[28]

The cotton industry was growing fast to gradually become an exporting sector, even surpassing silk. Japan's shipbuilding industries, light industries, sugar industries, beer brewing industries, and a variety of other industries were growing.

World War I brought about new life in the Japanese economy with attendant changes. As Chalmers Johnson puts it:

> World War I affected Japan's economy and economic bureaucracy in many significant ways. The War boom itself was extraordinary. In 1914, Japan's total exports and imports combined amounted to about ¥1.2 billion, but by 1919 this figure had grown to about ¥4.5 billion, excluding income from marine transportation and insurance premiums. During the period 1915-19, exports exceeded imports by about ¥1.3 billion, and the Bank of Japan used the profits from these years

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[26] Johnson, op. cit., p. 85.

[27] Yoshihara, op. cit., p. 129.

[28] Yoshihara, op. cit., p. 7.

> to pay off all of Japan's foreign debts, to purchase foreign bonds, and to increase the country's gold reserves.[29]

The effects of the War on the Japanese economy is given slightly differently by G.C. Allen as:

> Her invisible export greatly expanded... Japan's net income from freights rose from under 40 million yen in 1914 to over 450 million yen in 1918. Even in 1919... shipping boom continued... Japan's net credit on international account from trade and services... between 1914 and 1919... was about 1,700 million yen more than her net foreign indebtedness at that time.[30]

Even though there are some differences in the figures given by the two writers, the fact remains that World War I brought Japan economic blessings of a high magnitude. Japan could not, of course, derive substantial benefits out of the War had her industries not been prepared to expand production for increased export in response to surging War demands in the international market so far dominated by the West.

The government of Prime Minister (General) Terauchi in 1918 set up a Munitions Bureau as a semi-detached unit of the cabinet to prepare economic mobilization plans and to collect statistics on munition industries. During the mid-1920's of Taisho democracy, the military was forced to drop the efforts to plan for economic mobilization. But the interest revived again in 1927 during the government of General Tanaka Giichi, by which time many military officers had already had a chance to study and absorb the lessons of World War I and the war with Russia (1904-5). On 26 May 1926, the government established the Resources Bureau as a semi-detached organ of the cabinet and set up a joint public private deliberation council to discuss resources questions. The bureau undertook strengthening the compilation of industrial statistics and the first measures of genuine economic planning in Japan. The council achieved unprecedented results, and arranged some ¥30 million in loans to medium and smaller enterprises (a figure ten times larger than any previous loans).

Around this time of depression, the concept of industrial rationalization was also maturing. Various special deliberation councils, including private professionals, businessmen and experts

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[29] Johnson. op. cit., pp. 89-90.

[30] Allen. op. cit., p. 101.

were set up to tackle different sections of economic problems and to promote industrial laws and measures that propelled the Japanese economy through all its crises. The successful invasion of Manchuria in September 1931 gave Japan an opportunity to try a planned economy. Japan built dams for hydro-electricity and a power consuming aluminium plant there. A comprehensive and ambitious 5-year plan was made. Manchuria was 'the great proving ground' for Japanese industry. The government introduced a series of protective laws like the Foreign Exchange Control Laws in the 1930s.

In 1932, Japan, at the initiative of K. Takahashi, launched its famous policy of deficit financing to overcome depression. Military expenditure in the general account budget rose from 28% in 1930 to 43% in 1935 and the combined deficit of 1932-1936 reached an enormous figure of ¥1.9 billion. The government cut the yen free from gold, which produced a steep decline in the exchange value of the yen. The depreciation of yen against the US dollar from ¥100 = $49 in 1931 to ¥100 = $19 in 1932, and the consequent lowering of prices of Japanese goods overseas boosted exports particularly to Asia. Deficit financing worked well with an inflation rate within expected levels. Japan was well out of the depression before its international competitors had adopted similar policies. The military, civilian, and bureaucratic planners did not allow the problems to accumulate; they, despite sectional in-fighting, came out with innovative ideas for institutions, legal measures, implementation devices, and management without being misguided in their priorities since the beginning of the Meiji Restoration.

To supply educated and trained workers to the growing industries, compulsory education was introduced in 1872. Technical schools were established in the early Meiji period. On 1 March 1886, the government issued an imperial ordinance that "the Imperial University has the objectives of giving instruction in the arts and sciences and inquiring into abstruse principles required by the state", which established Tokyo Imperial University—or Todai, as it is known in short—as an institution to train an administrative service that would replace the *Samurai* (warrior) in the government. After Todai many more imperial and private universities were established in a short span of time. So, by 1920 and 1930, the Japanese government was equipped with highly learned and dedicated leaders produced by her own universities in all fields to steer their economy through all the crises.

As Saburo Okita views, the industrial policy of Japan was more or less:

> "Carefully select industries, prevent ruinous competition at the infancy stage, nurse them up to a competitive stature and then expose them to outside competition."[31]

In support of the policy, he says: "Western nations frowned upon our methods, but we felt it was the right policy for the late comers to pursue." He advocates: "A developing country should of course protect its infant industries, especially those industries that have a chance of success." Whether some countries like it or not, or whether somebody publicly admits it or not now because of conveniently defined popular slogan of 'free trade', Japan's industrial policy grew through a process of evolution and hard experience based on basic principles as indicated above by Okita.

PREWAR-POSTWAR CONTINUITY

The first known scientific preparation for the economic take-off started with the advent of the Meiji period in 1868. It was carried out by institutional adjustment by a somewhat trial and error method till 1885. By then the basic systems were perfected to a fair degree. The economic orientation was keyed to industrial policy. The education policy was born out of necessity to supply trained manpower to the industry, educated personnel to the administration and technical persons for research and development, and absorbing better technology from foreign countries. The prewar take-off started in 1885 and continued until 1920, with occasional fluctuations in between due to unknown circumstances. The 1920's was a period of recession. The soaring rice price led to passing of the Rice Law of 1920 in the Diet and initiation of a programme for developing rice cultivation in the Japanese colonies of Taiwan and Korea. The development in industries helped the development in agriculture by way of mechanization.

For the postwar economic take-off, the entire prewar period and the early 1950 may be considered the gestation period. The economic stabilization plan imposed by General MacArthur on 19 December 1948, which called for a balanced budget, strengthened tax collection, limitations on loans, improved controls over foreign

[31] Okita, op. cit., pp. 96-97.

trade and US aid, increased production, reduced civil service, and a few other reforms under the advice of SCAP-supplied adviser Joseph Morrell Dodge who arrived in Japan in February 1949. He helped the Japanese economy out of the ruin of War and paved the way for recovery to ultimately take-off again in the late 1950's. Table 4.3 shows the indices of industrial production which reflect some prewar and postwar economic development in Japan to demonstrate the important continuity and growth pattern.

Dodge established an official exchange rate of US$1=¥360 that lasted until 1971. He authorized the creation of the Japanese Export-Import Bank and the Japan Development Bank, and he supervised a number of critical decisions that affected the Japanese economy for years to come. He checked inflation by drastic cuts in demand, by firing government officials (about 10,000 people were fired from MITI alone between 1949 and 1951) and other measures—what used to be called "rationalization through unemployment."[32] This deflation was overcome by war profits within four years of the Korean war beginning in 1950, when the US army ordered 7,079 trucks from the Japanese industries and pumped some US$2.37 billion worth of special procurements into Japanese economy which was on its way to its postwar take-off.[33]

Japan got back its postwar independence in managing her economic affairs in 1952. From the time of the Meiji Restoration Japanese leaders have not believed in the *laissez faire* capitalist economy. When Japan discovered that during the War period the gap between her own technological level and that of the West had widened too far, she rightly decided to import Western technology and necessary machinery to narrow down the gap in all fields of production technology. When the economy recovered to a prewar level, she invested in the import of technology with the spirit and speed of the early Meiji period, despite some initial problems in balance of payment. As shown in Table, 4.4a and 4.4b, Japan imported technology in 447 cases in the field of textile; in 1,442 cases in the field of chemicals; in 175 cases in the field of petroleum; in 4,849 cases in the field of machinery; and in a large number of cases in other important fields between January 1950 and August 1971.

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[32] Johnson. op. cit.. p. 213.

[33] Ibid . p. 227.

Table 4.3. Indices of Japanese mining and manufacturing production, 1926-1978 (1975 = 100).

Year	Public utilities	Mining	Manufacturing industries							
			Iron & steel	Nonferrous metals	Machinery	Ceramics and cement	Chemicals	Petroleum and coal products	Pulp and paper	Textiles
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1926	2.5	54.5	1.5	4.0			1.5	0.7	4.9	17.4
1928	3.3	62.0	2.0	4.6			1.8	1.0	5.8	18.1
1930	3.9	62.0	2.1	4.8	1.4	8.4	2.5	1.0	5.5	21.8
1933	4.9	68.6	3.1	5.7	1.4	10.3	3.7	1.4	5.8	28.6
1935	6.0	81.0	4.4	6.7	1.4	11.6	5.2	1.8	5.9	33.4
1937	7.1	97.5	5.7	8.7	2.3[a]	12.7	7.1	2.5	8.0	40.8
1938	7.7	103.8	6.5	9.1	2.5	13.5	8.1	2.7	7.2	33.6
1939	8.1	108.8	7.2	10.3	3.1	14.2	8.6	3.2	8.3	33.6
1940	8.3	116.7	7.3	10.1	3.8	14.7	8.5	3.4	8.3	30.4
1941	9.1	117.1	7.5	9.1	4.4	13.1	8.5	4.0	8.5	24.6
1943	9.2	115.1	8.9	13.3	5.0	9.6	6.1	4.0	5.7	12.7
1944	9.0	105.1	8.3	14.7	5.8	7.5	5.7	3.2	3.3	6.8
1945	5.4	55.5	2.9	5.5	2.5	2.9	2.3	0.9	1.6	2.6
1946	6.9	40.9	1.0	2.9	0.8	3.1	1.4	0.4	1.7	4.3
1947	7.8	54.0	1.3	4.0	0.9	3.8	1.9	0.5	2.4	5.8
1948	8.5	66.2	2.1	5.5	1.4	5.8	2.5	0.8	3.5	6.6
1949	9.6	75.7	3.7	6.3	1.7	7.6	3.5	0.9	4.9	8.9
1950	10.3	80.0	5.1	7.3	1.8	9.0	4.7	1.7	6.7	12.6
1953	12.7	101.2	8.4	9.9	3.8	15.4	8.6	4.6	13.3	24.4
1955	14.5	98.0	9.8	12.2	4.3	17.7	11.3	6.2	16.6	29.6

(Contd.)

Table 4.3. ***(Continued)***

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1956	16.7	108.3	12.3	14.7	6.2	21.5	13.6	8.0	19.2	35.2
1958	19.7	115.7	12.8	16.0	9.3	23.9	16.0	10.0	21.3	34.8
1960	26.5	125.2	22.4	27.8	16.5	25.7	22.3	15.8	33.6	47.9
1962	32.9	137.0	28.3	32.5	24.0	45.3	29.2	21.4	43.4	54.5
1964	40.6	137.1	39 7	45.6	32.3	55.5	36.6	30.3	54.5	64.8
1965	43.3	135.2	40.8	45.3	32.8	57.1	40.1	34.8	55 7	69.4
1966	47.6	143.1	47.2	51.0	38.1	62.2	45.3	40.0	62 5	76.4
1967	54.0	141.0	61 1	61.6	49.6	72.8	53.0	48.1	69.6	83.3
1968	59.6	142.1	68.4	74.3	61.5	81.4	62.6	56.9	76.9	88.4
1969	67.0	142.9	82.6	86.6	74.8	90.3	73.7	67.9	86.6	97.0
1970	75.9	139.2	94 2	93.8	87.7	101 0	86.8	79.8	98.2	105 2
1972	87.4	121.9	98 7	108.4	87.3	109.5	97.2	91.5	106.7	110.8
1973	97.4	112.8	118 8	128.6	117.4	126.5	110.2	106.6	119.3	118.5
1974	97.3	105.8	116.9	112.6	116.2	117.0	109.9	104.4	113.7	106.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1977	113.7	103.1	103.1	125.0	121.3	115 2	117.2	104.7	115.3	106.7
1978	119.9	105.9	110.1	135.5	131.5	121.0	131.0	104.0	120.8	107.7

Sources: Mainichi Shimbun Sha. ed.. "Showa Shi Jiten" (Dictionary of Showa History). Tokyo. 1980. p. 457 as cited in Chalmers Johnson, *MITI and the Japanese Miracle* (Stanford: Stanford University Press. 1982). pp. 4-5.

Table 4.4a Trend of introduction of foreign technologies in Japan in selected period, January 1950-August 1984.

Technology fields	1950-1971 No. of cases	1982-1984 No. of cases
Manufacturing		
Textiles	**447**	**927**
Chemical products	**1,442**	**781**
Chemical fibers	35	–
Pharmaceuticals & agricultural chemicals	261	204
Organic industrial chemicals	628	
Inorganic industrial chemicals	197	
Others	321	
Petroleum products	**175**	
Glass, stone & clay	**212**	**120**
Metals & metal products	**282**	**184**
Iron & steel and non-ferrous metals	**448**	**104**
Machinery	**4,849**	
Electric machinery	1,613	2,146
Power transmission & distribution	250	250
Household appliance & lighting equipment	96	99
Communication equipment	580	607
Electronic equipment	181	
Others	506	
Transport machinery	497	248
Precision machines	228	189
Non-electric machinery	2,511	1,219
Prime movers	143	169
Metal working machines	259	
Textile machines	162	
Agriculture, construction & mining machines	145	
Other industrial machines	1,507	906
Others	295	
Foods & tobacco	**108**	**178**
Plastic products	**432**	
Other products	**460**	
Construction	**82**	**51**
Others 46	**785**	
Other industry		**91**
INDUSTRY TOTAL	**8,983**	**6,819**

Note: Japan introduced foreign advanced technology in electronic computer in 1,618 cases; 233 cases in semiconductor; 251 cases in atomic energy; 109 cases in Aerospace; 224 cases in Drug and Medicine, and 58 cases in biotechnology in just 4 years between 1981 and 1984.

Sources: Mustafizur Rahman, "Analysis of Japan's Economic Development"; *Industrial Review of Japan 1972*.; Science and Technology Agency, *Indicators of Science and Technology, 1985*. Tokyo.

Table 4.4b. Japan's introduction of foreign technology, its payment and spending on research and development (R&D) in selected years and comparison with some countries.

Year	Introduction of foreign technology by Japan		R&D spending (US$ million)						Distribution of R&D spending in Japan (as ratio of total R&D spending)				R&D personnel in Japan
						Japan			Tangible				
	No. of cases	Payment (US$M)	USA	UK	France	Amount	US$=¥*	% of GNP	Wages	Materials	fixed assets	Others	(no.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1949 - 50	76	2.6					360.00						
1951 - 55	1,065	66.3					"						
1956 - 60	1,773	280.5	13,523[a]			781[c]	"						
1961 - 65	4,494	687.0	14,316[b]			892[d]	"						
1965	958	166.3	20,044			1,183	"	1.27	45.3	16.8	24.9	13.0	303,789
1966	1,153	190.9	21,846			1,357	"	1.24	–	–	–	–	–
1967	1,295	238.7	23,146	2,309	2,507	1,684	"	1.31	–	–	–	–	
1968	–	314.0	24,605	–	–	2,133	"	1.40	–	–		–	–
1969	–	368.0	25,631	–	–	2,592	"	1.44	–	–	–	–	–
1970	1,768	433.0	26,134	–	2,705	3,320	"	1.59	43.6	16.5	22.9	17.0	392,236
1971	2,007	488.0	26,676	–	2,999	3,784	"	1.63	45.1	16.6	22.3	16.1	429,348
1972	2,403	572.0	28,477	3,389	3,619	5,233	303.20	1.64	46.6	16.5	20.7	16.2	426,935
1973	2,450	715.0	30,718	–	4,447	7,304	271.22	1.70	46.4	14.9	21.3	17.5	459,239
1974	2,093	718.0	32,864	–	4,784	8,290	292.08	1.75	50.5	14.5	18.0	17.0	468,060
1975	1,836	712.0	35,213	4,752	6,113	10,022	296.79	2.11	52.1	13.6	17.1	17.2	491,296

(Contd.)

Table 4.4b (*Continued*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1976	1,893	846.0	39,018	–	6,230	9,920	296.55	–	51.7	14.2	15.8	18.3	487,999
1977	1,914	1,027.0	42,783	6,952	6,754	12,043	268.51	–	51.4	14.3	15.7	18.5	492,288
1978	2,139	1,241.0	48,129	–	8,347	16,967	210.44	–	50.0	14.9	16.7	18.4	486,777
1979	2,116	1,260.0	54,933		10,227	18,622	219.14	–	48.3	14.9	17.3	19.5	496,032
1980	2,142	1,439.0	62,593	–	12,073	20,661[e]	226.74	2.35	46.9	15.5	18.3	19.2	521,119
1981	2,076	1,711.0	71,839	12,219	11,495	24,322[e]	220.54	–	45.0	16.9	18.8	19.3	548,312
1982	2,229	1,796.0	79,301	–	11,104	23,613[e]	249.08	–	44.4	17.1	18.2	20.3	567,235
1983	2,212	2,079.0	89,139	–	11,108	27,384	237.51	2.95	44.5	16.9	17.5	21.1	587,182
1984	2,378	2,316.0	101,139	–	10,863	30,217	237.52	–	43.7	17.8	17.5	21.0	627,814
1985	2,436	2,339.0	113,819	–	10,863	34,031[e]	238.54	3.13	42.3	18.1	18.1	21.5	646,299
1986	2,361	2,546.0	119,353	12,878	–	49,941	168.52	3.18	42.8	18.5	17.3	21.4	676,023
1987	2,709	1,958.0	125,353	–	20,499	62,353	144.64	3.29	42.3	18.1	17.9	21.8	691,822
1988	2,834	2,436.0	133,740	18,402	–	–	128.15	3.43	42.2	18.9	16.4	22.5	715,337
1989	2,898	2,300.0	140,763	19,409	22,231	79,053[e]	137.96	–	41.1	19.3	16.7	22.9	740,438
1990	3,211	2,767.0	146,152	–	30,824	89,952	144.79	3.51	40.8	19.6	16.3	23.3	769,696
1991	3,175	–	150,800	–	–	102,239	134.71	–	–	–	–	–	–

Note: *The rate of ¥360 to a US dollar was set on 25 April 1949. With the entry of Japan into IMF in August, 1952, this became Japan's official exchange rate and continued for about 22 years until the rate became floating on 28 August 1971. [a]1960. [b]1961. [c]1962. [d]1963. GNP is also represented by national income in some cases): [e]The US$ figures are converted from Yen at IMF exchange rate.

Sources: MITI, Statistics on Japanese Industries 1969; S&T Agency, *Indicators of Science and Technology 1985* and 1993; National Science Board. *National Science Indicators. The 1985 Report.* (National Science Foundation, Washington DC, 1985. pp. 218); Keizai Koho Center. *Japan 1980, 1981* through 1993.

However, she successfully kept foreign investment in Japan at a nominal level. The investment allowed under scrutiny mainly served Japan's own long-term interest. Japanese investment was not limited to only a few individual fields. The investment in technology, as well as plant and equipment, was both broad-based and massive. This investment would have been impossible or impractical had she depended on foreign loans or had she kept her domestic interest rate at a high level. Table 4.5 shows that the official discount rate in 1963 was 5.84 %; in 1971 it was 4.75 %; and 3.5 % in 1978. The prime rate was just 0.25 % above the discount rate. In comparison, the official discount rate in West Germany and the USA was around 3 % in 1963 and 4.0-4.5 % in 1971. The discount rate in West Germany in 1978 was as low as 3.0 % while that in the USA in the same year was 9.50 %. The banking system in the West however kept the prime rate usually at a level much higher than it was in Japan. Japan's tight control of foreign exchange did not cause any harmful outward flow of money. Her domestic savings could be funnelled into industrial investment effectively to create production spurt followed by export spurt and vice-versa in the 1950's through the 1970's with occasional slow-downs due to international recession.

What is peculiar to Japan's economy is a high rate of capital formation even after World War II. The gross capital formation in the form of investment in private plant and equipment is particularly high. Japan's gross capital formation was US$4,438 million in 1952; US$6,456 million in 1955; US$15,846 million in 1960; and US$16,946 million in 1973 (Table 4.6). In the percentage of GNP, the gross capital formation was 24.7 in 1955; 33.8 in 1960; and 39.5 in 1970. The share of private equipment investment in percentage of GNP is as high as 10.3 in 1955; 18.8 in 1960; and 20.2 in 1970. Interestingly, Japan did not try to build up foreign exchange reserves until her balance of payment was markedly favourable.

Doubtlessly, the US procurement during the Korean war as well as during normal times to maintain US forces in Japan helped the Japanese economy to some extent after World War II. Direct US financial aid was given to Japan only for a few years immediately after the War. Except for this limited help and some loans from the World Bank, starting with US$40.2 million in 1953 for electric power companies and subsequently for some steel companies, Japan relied on its internal finance for local mobilization and on export

earnings for import of capital goods. Even such small borrowings were bitterly criticized in the Diet by irritated nationalists as a

Table 4.5 Interest rate, official discount rate, and public debt of Japan and a few selected countries.

	Japan				Germany	USA		
Year	Official discount rate (%)	Prime rate (%)	New bond issued ¥ billion	Public debt. O/S ¥ billion	Official discount rate (%)	Official discount rate (%)	Prime rate (%)	Federal debt O/S (US$ billion)
1963	5.84	6.09			3.00	3.50		
1964	6.57	6.82			3.00	4.00		
1965	5.48	5.73	197		4.00	4.50		
1966	5.48	5.73	666		5.00	4.50		
1967	5.84	6.09	709		3.00	4.50		
1968	5.84	6.09	462		3.00	5.25		
1969	6.25	6.50	413		6.00	6.00		
1970	6.00	6.35	430		6.00	5.50		382.6
1971	4.75	5.00			4.00	4.50	5.25	–
1972	4.25	4.50	1,950		4.50	4.50	6.00	–
1973	9.00	7.25	1,766		7.00	7.50	10.00	–
1974	9.00	9.25	2,160		6.00	7.75	10.50	–
1975	6.50	6.75	5,281		3.50	6.60	7.25	544.1
1976	6.50	6.75	7,198		3.50	5.25	6.25	–
1977	4.25	4.50	9,985		3.00	6.00	7.75	–
1978	3.50	3.75	10,674	42,616	3.00	9.50	11.75	–
1979	6.25	6.50	13,472	56,251	6.00	12.00	15.25	–
1980	7.25	7.50	14,170	70,510	7.50	13.00	21.50	914.3
1981	6.25[a]	6.75[b]	12,900	82,273	7.50	14.00	20.00	1,003.9
1982	5.50	6.00	14,045	96,482	4.00	8.50	11.50	1,147.0
1983	5.00	5.50	13,486	109,695	4.00	9.00	11.00	1,381.9
1984	5.00	5.50	12,781	121,694	4.50	7.50	10.75	1,576.7
1985	3.50	5.50	12,308	134,431	4.00	5.50	9.50	1,827.2
1986	2.50	3.75	11,255	145,127	3.00	6.50	7.50	2,120.1
1987	2.50	3.38	9,418	151,809	2.50	5.50	8.75	2,345.6
1988	3.25	3.38	8,841	156,780	3.25	6.00	10.50	2,600.8
1989	3.75	–	7,111	162,000	6.00	7.00	10.50	2,868.8
1990	6.00		5,593	166,338	6.50	7.00	10.50	3,206.3
1991	4.50	–	5,343	177,647	7.50	6.50	6.50	3,599.0
1992	3.25	-	7,280	173,846	8.50	3.50	6.00	4,077.5
1993	2.50[c]	4.00	–	-	7.25[d]	3.00	–	4,543.0

[a]Annual interest rates on city bank deposits were 2.25% for regular demand deposits and 6.25% for 1-year term deposit as of Aug. 1, 1981. [b]End of June. O/S: Outstanding. [c]Mid-February, 1993. [d]April 23, 1993. East and West Germany unified in 1990.

Sources: For 1963 - 1970, Ministry of Foreign Affairs. Japan, *Statistical Survey of Japan's Economy, 1971*; for 1971 - 1981, Keizai Koho Center, *Japan 1981 (-1993)*.

"national dishonour". For all intents and purposes, Japan did not resort to external aid for development in the sense prevailing today. That foreign capital did not have a significant contribution to Japan's economic development is also confirmed from the following citation of G.C. Allen by Henry Rosovsky:

> Japan's economic development....owed no major debt to the Western investor, although there were two short periods, 1899 to 1913 and 1924 to 1930, of which this conclusion is true only with qualifications. During the first of these periods, however, the motives which led her to borrow worth abroad were not solely, nor even predominantly, for the purpose of financing industrial expansion; for the chief loans were intended to cover expenditure on war or war-preparation. Even in the second period a substantial part of the capital raised abroad was required for reconstruction after the Great earthquake. At its peak in 1930, foreign investment totaled only ¥2,466 million.[34]

Japan made ceaseless efforts not only to expand her industrial base but also to improve the quality of products and to cut costs through so-called industrial and management rationalization. Despite the prevailing inflation, Japan did not encourage increase in wages at rates higher than the rate of increase in productivity. Numerous instances of wage cuts occurred in the course of industrial rationalization. All these combined factors gave the Japanese products a formidable price competitiveness and helped her in her all-out efforts to capture the world market. When exports started surging, the government reserve as well as the savings of the private sector also increased. The savings were invested for further expansion of the economy. Gradually, investment in research and development was given importance to strengthen the technological base for sophisticated industries that yielded still higher profits. From 1950 onward Japan's economy was on full acceleration, and continued till recently except for some temporary slow-downs.

The growth in exports, favourable trade balance, and gross domestic fixed capital formation, highest amongst the industrial nations, speak for themselves of the spectacular achievement by Japan, which manifests the rationality of the Japanese economic policy keyed to industrial policies. The tradition of government-business relation is healthy because of the similar educational background, mutual respect and identical objectives of promotion of national interests rare in most other societies.

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[34] Rosovsky. op. cit.. p. 97.

Table 4.6. Japan's gross capital formation, foreign exchange reserve, GNP growth rate, export, trade balance, direct overseas investment and US aid receipt.

(Unit: US$ million and %)

Year	Gross domestic capital formation			GNP growth rate at current prices (%)	Export (FOB)	Import CIF	Trade balance	Foreign investment in Japan	Japanese overseas investment	USA special procurement	US Aid to Japan	Japan's foreign exchange reserve
	Value	% of GNP										
		Total % investment	Private equipment									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1887		12.3										
1922		18.4										
1931		25.0										
1935					717	710						
1945 Sep. - 1946 Dec.	-	-		-	103	306					193	
1947					174	526					404	
1948					258	684					461	
1949					510	905					535	
1950	-	-	-	-	820	974	-	3.15[a]		149	361	
1951	-	-	-	38.8	1.355	1,995	-		*	592	164	930
1952	4,438	-	-	16.3	1,273	2,028	-			824		913
1953	4,506	-	-	18.1	1.275	2,410	-			809		637
1954	6,456	24.7	(10.3)	13.3	1.629	2,399	- 460			596		738
1955					2.011	2,471		188.55[b]		557		839

(Contd.)

Table 4.6. ***(Continued)***

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1956	8,027	28.8	(14.1)	12.3	2,501		-			595		941
1957	–	–	–	–	2.858	4.284				549		524
1958	9.411	27.7	(14.9)	4.8	2.876	3.033				482		831
1959	–	–	–	–	3.456	3,599				458		1,322
1960	15.846	33.8	(18.8)	19.1	4.055	4.491	268	878[c]	95	549		1,824
1961	21.276	40.5	(21.4)	22.5	4.236	5.810	-558		163	449		1,486
1962	21,022	35.8	(20.0)	9.1	4.861	4.460	401		99	376		1,841
1963	21.875	–	–	–	5.391	5.557	-166		122	347		1,878
1964	28.920	36.2	(18.6)	15.9	6.704	6.327	377		113	337		1,999
1965	30.858	33.0	(15.9)	10.6	8.332	6.431	1,901	3,582[d]	155	354		2,107
1966	31.511	–	–	–	9,641	7.366	2,275		225	485		2,074
1967	47.079	37.3	(17.4)	17.9	10.231	9.071	1,160	1,837	227	532		2,005
1968	48.133	–	–	–	12.751	10.222	2,529	848	527	587		2,891
1969	68.334	38.4	(19.9)	18.0	15.679	11.980	3,699	-	665	641		3,496
1970	81.705	39.5	(20.2)	16.3	18.969	15.006	3,963	-	904	661		4,399
1971	93.778	36.4	(18.7)	10.7	23.566	15.779	7,787	-	858	623		15,235
1972	108.252	–	–	–	28.032	19.061	8.971	-	2.338	710		18,365
1973	164.945	-	-	-	36.264	32.576	3,688	-	3.494	739		12,246
1974	172.836	-	-	21.6	54.480	53.044	1.436	-	2.395	704		13.518
1975	163.483	32.0	(15.9)	12.4	54.734	49.706	5,028	-	3.280	733		12.815
1976	177.360	30.9	(14.4)	9.9	66.026	56.139	9,887	196	3.462	752		16.604
1977	212.033	30.2	(13.3)	–	79.333	62.022	17,311	224	2.806	818		22,848
1978	305.051	31.1	(13.3)	–	95.634	71.038	24,596	235	4.598	968		33.019
1979	326,599	32.3	(13.6)	–	101.232	99.387	1,845	524	4,995			20,327
1980	335.878	32.0	(13.4)	–	126.736	124.611	2,125	299	4.693			

(Contd.)

Table 4.6. ***(Continued)***

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1981	360,949	30.7	(15.4)		149,522	129,555	19,967	432	8,906			28,403
1982	320,843	29.5	(15.0)		137,663	119,584	18,079	1,006	7,703			
1983	332,103	28.0	(15.0)		145,468	114,014	31,454	813	8,145			
1984	350,501	27.7	(15.7)		168,290	124,033	44,257	493	10,155			26,313
1985	369,079	27.4	(16.5)				61,601	930	12,217			
1986	541,835	27.7	(16.1)				101,648	940	22,320			
1987	685,564	28.3	(16.7)				94,084	2,214	33,364			81,479
1988	866,750	30.5	(18.3)				95,302	3,243	47,022			
1989	889,867	30.8	(19.6)		275,175	205,176	69,999	2,860	67,540			84,895
1990	947,340	32.0	(20.4)	5.6	286,948	217,084	69,864	2,778	56,911			79,707
1991	1,063,217	31.4	–	4.4	312,004	198,321	113,683	4,339	41,584			73,272
1992	–	–	–	–	339,760	199,306	136,051	4,080	34,140			68,685

[a]1949-50. [b]1951-55. [c]1956-60. [d]1961-65. *Japanese total direct overseas investment in 1951-1991 is US$352,392 million while the total foreign investment in Japan during the same period (1951-1991) is US$22,771 million which is about 6.46% of Japan's overseas investment. Japan's direct foreign investment in 1992 excludes foreign purchases of less than 10% stakes in unlisted companies, inclusion of which would make the figure the same as previous years.

Export and import values might differ depending on whether they are based on IMF or custom clearance data or MOF data. The trade balance may thus not always be the difference between export and import values. Foreign reserve at end-June, 1993 was US$86.42 billion.

Sources: Rosovsky, op. cit., P9; G.C. Allen, op. cit., pp. 270; Saburo Okita, op. cit., pp. 200, 202; Douglas Wilder Morrill, "Economic effects of Japan's Barriers to International Trade and Investment, 1951-1973" (PhD diss., Indiana University, 1976), p. 147; Ministry of International Trade and Industry, *Statistic on Japanese Industries, 1969* (Tokyo: Tsusho-Sangyo Chosakai, 1969), p. 105; Ministry of Foreign Affairs, *Statistical Survey of Japan's Economy*, 1971, p. 55; (1978), p. 55; *Kezai Koho Center, Japan 1980*, 1981 through 1993; Bank of Japan, *Comparative Economic and Financial Statistics Japan and other Major Countries 1992.*

To reduce cut-throat local competition and to strengthen its export position during recessions, Japan allowed and sometimes imposed business cartels, like the Japan Paper Manufacturers Federation of 1880, the Japan Cotton Spinning Federation of 1882, and Japan Fertilizer Manufacturers Federation of 1907. In 1925, the Exporters Association Law and the Major Industries Association Law came into force and are still being employed in some form or the other to allow rationalization and recession cartels to turn competition into cooperation whenever necessary despite the existence of the anti-monopoly law and the Fair Trade Commission now. Japan enacted Foreign Capital Law in May 1950, which allowed foreign capital in selected areas under directly or indirectly MITI-guided terms that protected national interest.

The agricultural policy to make farmers economically better off by such measures as price stabilization and fixation of higher grower price and lower consumer price of rice as early as 1934 enabled farmers to mechanize agriculture. This agricultural mechanization resulted in higher yields for farmers and a big market for agricultural machinery industries immediately. The increased purchasing capacity and higher savings of the farmers brought about a boom in almost all other sectors of industries by providing a market for products, as well as necessary private funds through banks for further investment in productive industries.

The private savings also helped government in adopting deficit budgets by issuing bonds for capital investment for accelerated development. The low rate of interest that prevailed kept the cost of investment funds low. This was necessary for the very viability of the industries, particularly for the simple reason that as late as 1972 the rate of owned capital was only about 16%. This pattern persisted throughout the postwar period. The reality of nationalism that cannot be accepted in theories was an active element in the Japanese economy. The legal, taxation, education, administrative, and other social systems are all made to fit their design to achieve national objectives. The interaction of nationalism and rationalism probably had been at their best in Japan.

Chapter 5

DRIVING FORCES BEHIND JAPAN'S ECONOMIC DEVELOPMENT

WHAT MADE JAPAN GROW

It has always been a question to the researchers of Japan's economy as to what made Japan grow. "How could the tiny islands of the Eastern-most part of Asia overtake the advanced countries of Europe in GNP as early as the 1960's?" is rather a common question most of the economists delving in Japan's economy have been trying to answer. As it has been demonstrated in the previous chapters, different writers, in the course of their research, gave emphasis on different aspects of Japan's development process. The reason that hardly any individual writer could come up with all the aspects of Japan's development process was probably that the subject is quite complex and vast. This work attempts to ascertain the factors which collectively made the development of Japan possible, or which stimulated the development itself. It shall also term the factors as driving forces behind Japan's economic development.

Before dealing with these driving forces, it is necessary to consider some problems or questions referred to by Blumenthal while dealing with the Japanese shipbuilding industry:

> Dealing with Japan's economic growth in general and the development of any subsector of the economy in particular involves the following problem: Should the prewar and the postwar periods be regarded as a continuum, or as qualitatively different? Have the same basic economic forces operated in both periods, or did the economy undergo some structural change between the two periods?[1]

[1] Blumenthal, op. cit., pp. 141-42

The first question has been answered by narrowing down its scope:

> With respect to the shipbuilding industry, the answer to the question seems to be less ambiguous than in the case of other industries. Though a continuation does exist, great dissimilarities between the development of the industry in the two periods lie mainly in three areas: (1) origin of demand; (2) production technology used; and (3) the rate of growth of the industry.[2]

These differences are obvious in that the political changes brought about by World War II changed both the origin and magnitude of demand by civilian rather than naval forces. The large-scale import of technology could answer to high demand through an improved production system. The rate of growth was obviously high after the war because of higher demand and better technology.

From the studies of various subsectors made so far, the common justified argument is continuity between the prewar and postwar economy. If a more careful analysis is made, a continuity of the development in the late Tokugawa era and the Meiji era may also be established. The existence of such continuity was logically supported by many earlier researchers.[3] It may, however, be difficult for many researchers to appreciate this continuity if the qualitative and quantitative differences between the two apparently different economies cannot be recognized to be a result of a morphosis of the same stock. It may be difficult to appreciate it if even the differences or the causes of the differences are taken up for analysis with the tools of market forces alone.

Japan's economy was not necessarily built by market forces alone; rather market forces were utilized for the growth. As a former MITI vice-president, commenting against antitrust legislation which the West asserted to be an indispensable tool of industrial policy in order to maintain competition, said:

> Japan's industrial policy, which is hostile to antitrust legislation, has produced higher levels of both competition and growth than the economies of Japan's Western critics.[4]

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[2] Blumenthal, op. cit., pp. 141-42.

[3] Rosovsky, op. cit., p. 90.

[4] Johnson, op. cit., p. 227.

Japan's development policies do have elements that apparently go counter to many modern economic theories. Rosovsky asserts one such case by quoting Even Alvin Hansen as saying:

> There is far too great a tendency now a days to plead for policies that encourage investment in material capital goods — plant and equipment ... and to forget that outlays on the improvement of our human resources may even be more productive. I have no quarrel with this view, especially as it applies to Japan.[5]

It may also help to understand Japan's development, if one appreciates the positive economic contribution of various apparently non-economic factors like nationalism, motivation, loyalty and "traditional capital formation" in the pre-industrial age.[6] An understanding of the possibility of a capitalist economy falling beyond *Laissez faire* economy may also be useful in finding the driving forces behind Japan's economic development.

MAIN DRIVING FORCES

Japan's development process and the driving forces behind Japan's economy may well be explained in terms of a few factors collectively responsible for Japan's development. Japan's development has been more systematic and massive than simple words like miracle, copying, free ride, or life-long employment alone can explain. From the study and analysis made so far, the whole Japanese economic development process may well be considered to be the outcome of the interaction of the following factors working as a system:

1. Pre-Meiji isolation of Japan and situational motivation in the Meiji era and afterwards;
2. Ceaseless efforts by Meiji leaders to evolve a strategy to achieve development with their own resources;
3. Priority to education and its continuous improvement;
4. Farmer-oriented agricultural policies;
5. Creation of a dedicated and educated bureaucracy and conversion of government-business rivalry into active cooperation;

[5] Rosovsky, op cit., p. xii.

[6] Ibid., p 16.

6. Timely realization of the importance of long-term industrial policies and import of technology;
7. Occasional military intervention in prewar economic and industrial policies;
8. Formulation of growth-oriented fiscal and monetary policies;
9. Introduction of a rational taxation system and effective deferment of domestic consumption in favour of savings for productive investment;
10. Expansion and protection of domestic market while expanding export drive;
11. Evolution of legal systems and institutions capable of monitoring and solving crises with keeping an eye on tradition;
12. MacArthur's rationalization plan and American imposed constitution and security treaty;
13. Identification of national interest and attachment of top priority to it continuously in all changed circumstances;
14. Effective methods of handling labour resources;
15. Effective control of foreign capital investment in Japan and import of technology; and
16. Prevalence of rationality and prewar-postwar continuity in national development system and leadership.

The above list is not exhaustive or final, but readers and researchers might find that any missing factor shall also fit into the system. The above factors can now be elaborated to clarify the important points whenever possible. This had to be done within great limitations and in a broad aggregate.

Pre-Meiji isolation of Japan and situational motivation in the Meiji era and afterwards. The theories that attempt to attribute the rapid growth of modern Japan to either Japanese national characteristics, nationalism or diligence, or natural instincts for survival may be better substantiated by an analysis of Japan's historic *Sakoku* (isolation) from 1639 to 1854.

In those days, the Portuguese, Spanish, Dutch, and other European sailors made their voyages to distant ports not only to trade but also to colonise the weak and resourceful places. Japan was not an exception. Christianity was spreading in power mainly in the southern islands of Kyushu. The Japanese found that they were no match for the Western voyagers, who were Christians, in sea

power. They avoided serious confrontation and thought of resisting Christianity in a systematic way. Shogun Oda Nobunaga, Toyotomi Hideyoshi, and Tokugawa Iyeyasu, historic national heroes, roused the feelings of the people against the spread of Christianity and thereby gathered the moral support for subsequent curbs in foreign trade and gave the people a sense of nationalism that has never ceased to continue and strengthen itself to face challenges even to this day. The geographical conditions of Japan, with 75 % of the land covered by mountains and with an unfavourable cold climate, did not encourage the Dutch East Indian Company or other foreigners to fight the marginally living 30 million Japanese. The successful imposition of a trade blockade was thus possible, which probably saved Japan from possible colonization. The severe climate did not allow the resourceless Japanese to survive in idleness. They had to fight the elements and cultivate, even on the risky slopes of the mountains, to feed themselves. Everything from shell, squid, octopus, crab, raw fish, and sea weed to bamboo shoots formed their food.

Japanese leaders, however, did not forget that they were weaker than the foreign invaders or voyagers. They wanted a window to be opened for inflow of knowledge and necessary scientific techniques prevailing in the outside world at that time. Even during the isolation period, the Chinese and the Dutch, considered to be more amenable than their business rival, the Portuguese, were allowed a limited access under strict supervision in the Kyushu area.

This isolation is criticized by many as the reflection of the closed nature of Japan, but when the protection and defense of the nation is in question, the explanation is not the same. Citing the *Fusa Shogyokokkaron* (National trade blockade or control theory) or *Der Geschlossene Handelsstaat* (1880) of Johann Gottlieb Fichte, who describes the ideal trade embargo as "to stop international trade by the general public and allow government monopoly to carry out very limited trade in some specific port or border area under strict supervision of the competent state department", Engelbert Kaempfer says: "This conception seems as if it was modelled around the actual occurrence of transactions between the Japanese and the Dutch in Nagasaki during this period."[7] In the present and recent past world, the trade restrictions of the entire communist block and the selected restrictions by many developing and developed countries are not

[7] Kobori Keichiro *Sakoku no Shiso* (in Japanese), Chuo Koronsha, 1974, Tokyo, p. 183.

much different from the Japanese *Sakoku* in its basic sense. Without this period of isolation, nobody can say how the history of Japan would have changed and what economic situation it would face today.

This isolation gave Japan a sense of unity, nationalism, self-confidence, diligence, a liberal food habit, a distaste for waste and developed instincts for protecting themselves against external forces. In addition, this gave them a peaceful period for cultivation of their own culture and homogeneous characteristics while living within their own means.

The US commodore Matthew Perry's mission in 1853 made the Tokugawa Shogunate enter into a treaty to end *Sakoku* in 1854. This treaty was broadened in scope in 1858 to open trade with Britain, France, and a few other countries. Neither of these treaties may be considered to be made by the Shogunate of its free will. The Shogunate realized that a confrontation would be too costly and dangerous, because Japan's power would be no match to the foreign power at that time, which had already demonstrated its superiority by defeating the Chinese (by the British force) in the Opium War of 1839-42. It was also feared that the continuation of isolation might put them in a defenseless position.[8] The treaty to open Japan was made despite internal opposition to it. As to the 1858 treaty, Allen says:

> In 1858, the government was compelled to sign treaties which conferred rights of trade on British, French and other nationals; five ports were opened to foreign shipping; and extra-territorial rights were granted to foreigners. The irresistible might of Westerners' naval equipment was demonstrated to the clans most hostile to this enforced change of policy by the bombardments of Kagoshima and Shimonoseki in 1863 and 1864. Foreign aggression thus brought to light the weakness of the old regime, emphasized the need for change, and to some extent, determined the nature of transformation in Japan's economic and political life that subsequently occurred.[9]

Even though the foreigner's presence was not the paramount cause that impelled Japan to adopt the foreign civilization, it is believed by some that their presence served merely to hasten what was inevitable. It is also believed by some that "the true cause of the recent marvellous changes in Japan... operated mainly from within,

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[8] Ike, op. cit., p. 19.

[9] G. C. Allen, op. cit., p. 23.

not from without, from impulse not from impact."[10] The important question is not the degree of influence the foreigners had on the decision of opening, or whether there was also an internal desire growing gradually from within the Shogunate to open Japan some day. The major question is that the Tokugawa leaders, who began the *Sakoku* in 1639 to avoid colonization, were now facing a bigger challenge to unite the people again to face foreign powers many times more powerful than it was in 1639. This time the unity grew around the feelings of revived and probably stronger nationalism. There were opinions for and against continuation of *Sakoku* that led to a chain of events that finally brought about the Meiji Restoration, with the task of saving the nation. The Meiji objectives of a 'rich country and strong army' were thus determined by the nature of the transformation under the circumstances as the voice of the people and, as a long-term strategy, to face foreign powers.

The isolation served its purpose of generating nationalism, frugality, and self reliance during the period and of transferring a stronger nationalism and objectives to the Meiji government.

Ceaseless efforts by Meiji leaders to evolve a strategy to achieve development with their own resources. When the conditions of *Sakoku* were relaxed gradually to widen external trade again, the early Meiji leaders found a gap between the material development in the outside world and that in Japan, which they thought to have developed a lot during the period of isolation based on whatever knowledge and techniques they could get from the European civilization before and to some extent during the period of isolation. This was a period when international loans[11] were unheard of in this part of the world. The only way of development was the rational allocation of scarce resources to the priority investment areas, suppression of potential domestic demands to the level of production and enhancement of productivity. The methods were not, however, understood as easily as today. They wisely took the policy of "learning from the world" instead of considering their own knowledge to be the best. In course of the search for a strategy, the requirement for education, the necessity of streamlining the Samurai-dominated administration, the importance of better financial

[10] Ibid.

[11] Britain however arranged a loan of ¥3.75 million in 1867 mainly for the purpose of constructing the 18-mile Tokyo-Yokohama railway and another foreign loan of ¥10.7 million was also arranged to meet the financial need to end feudalism. Allen, op. cit., p. 43.

management, the importance of agriculture, industries, and foreign technology, and the importance of various other reforms were clearly realized. They made all possible efforts to implement whatever they believed in. The introduction of compulsory education in 1872, introduction of the Meiji constitution in 1889, introduction of a non-Samurai Public Service System, adoption of industrial policies and so forth were but some of the outcomes of the ceaseless efforts by Meiji leaders to find a self-reliant development strategy. The major strategies of their influence on present Japan are dealt with briefly in the subsequent sections.

Priority to education and its continuous improvement. Although the rate of literacy was about 50 % for males and about 15% for women towards the end of Tokugawa period and despite the establishment of training schools like the Naval Training School in Nagasaki in 1855 with foreign instructors, the necessary reforms and modernization envisaged by the Meiji leaders demanded larger and highly educated personnel for their materialization. The establishment of the Ministry of Education in 1871, introduction of compulsory 4-year primary education in 1872, establishment of Tokyo University in 1877 (incorporating many special institutions started still earlier), and the reorganization of Tokyo University into Tokyo Imperial University in 1886 were some of the important events, especially when it is considered that many Asian countries had not introduced compulsory primary education more than one hundred years after the Japanese.

There are, of course, very many general and highly specialized universities now, but the highly placed bureaucrats, technocrats, scholars, politicians, and the business leaders in that period were mainly the products of the prestigious Tokyo University, or Todai as it is called in short. The quality of education has continuously improved. Post-graduate students are required to study at least two European languages to harness the knowledge and technology available in those countries. German systems had a lot of influence on the Meiji leaders. Japan invited a large number of foreign teachers, and also had their own people trained in Europe and in the United States. Most important, text books were written in Japanese or translated therein. A tradition of research was built up through the establishment of research institutes and national laboratories under the university or directly under the control of the government ministries. Science education was rightly given priority. The result is the

present state of development in Japan which the associate editor of the weekly *Education USA* referred to in his article, "Science Education = Economic Might":

> Over the past 20 years, the governments of Japan, West Germany and the Soviet Union have dramatically upgraded their education programs in mathematics and science. All three did so because they realized that economic success—and in the case of the Soviets, military success—demanded a work force that was knowledgeable and skilled in science and technology. . . Japanese leaders often point to the rigor of their education system as a key to their economic success.[12]

Clearly, modern Japan would have been quite different economically and otherwise if education had not been given priority in the development process of Japan. The attachment of the right priority to education from the beginning of the Meiji era as the tool for westernization and economic development was one of the wisest steps the Meiji leaders took when they took into stock the difficulties in the modernization process without western education in the early Meiji period. Today's high percentage of higher education in Japan, next only to the US, is the result of what was done since the Meiji period and earlier.[13] It is this higher education that has allowed Japan to maintain a remarkable international position in high technology, considered important for her economic health in the past as well as in coming years.

Farmer-oriented agricultural policies. During the Tokugawa period Japan was basically an agricultural country. The land taxes were collected in rice, and stipends to the Samurai were paid in rice. There were great and small *daimyos* in accordance with the rice revenue they could pay. During the Tokugawa period, the total yearly rice revenue was about 26,433,097 koku.[14] Silk was one of the major export items towards the last part of the Tokugawa period and through the Meiji era. During 1868-82, the export of raw silk, silk products and tea made up for 71.1% of Japan's total exports of ¥302 million.[15] Tokugawa leaders made some investments in the agricultural infrastructure to increase production, but farmers were not free to change professions. About four-fifths of the employed

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[12] *The Japan Times*, June 24, 1981, reproduced from *The Washington Post*.

[13] Keizai Koho Center, *Japan 1982*, p. 76.

[14] Takahashi Masao, op. cit., p. 20. One koku = about 150 kg.

[15] Ibid., p. 79.

people of about 19.5 million population were still engaged in agriculture, forestry, and fishing.[16] The Meiji government changed the land tax system, giving peasants freedom to change their cropping pattern.

The Meiji government took up an elaborate agricultural policy of introducing advanced agricultural equipment, improved techniques, and new crops. Citing Okazaki, Takahashi Masao says:

> In April 1870, American cotton seeds were imported and distributed to various provinces for experimental cultivation. Seeds of pasturage grass, sugar beet, turnip, etc., were imported by the Tokyo Land Development Office. From that year until 1890, the seeds or seedlings of the new varieties of the following crops were imported and distributed to various prefectures: vegetables, rice, wheat, barley, corn millet, fruit trees, tobacco, cotton, hemp tea, peanuts, olive, cinchona, hop, indigo plants, grass bulbs of flower plants, tropical plants, etc.[17]

Agricultural output does not grow as fast as that of industries, but for a resource-poor country, industrialization may not be possible without the support of agriculture.

Like most other Asian countries, Japan was a predominantly agricultural country with 45.1% of the national product coming from this sector as late as 1914. When the Meiji government, after initial direct investment in mines, railroads, arsenals and factories, was confronted with the unpleasant facts of inflation and trade deficits, it was silk, the so-called God-sent product, that helped Japan in balancing its trade. To unify all of the government's various economic activities, the MAC was created in 1881. Attending to agriculture was certainly the most important activity of the new ministry which gradually strengthened itself by recruiting new technical agronomists from Tokyo University.

World War I had its effect on Japanese agriculture. The War boom raised the price level of rice, which was going to create pressure on industries in the form of labour demands for pay rises. The landlords who had an interest in agriculture liked this price increase, as did the government initially. The panic of a rice price hyke led to passing of the Rice Law of 1920. Duties on imported rice were removed and an initiative for rice cultivation in the Japanese colonies of Taiwan and Korea was taken. To give more attention to agricul-

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[16] Allen, op. cit., p. 64.

[17] Takahashi Masao, op. cit., p. 75.

ture, a separate ministry, called the Ministry of Agriculture and Forestry, was created in 1925 with 5,879 employees out of the old MAC. Government undertook various programmes for agricultural infrastructure, financial assistance, and credit facilities. To stabilize consumer price and, at the same time, to raise the purchasing capacity of farmers to mechanize the cultivation for higher productivity, government introduced around 1934 a huge scheme of subsidies to pay off the difference between the fixed higher grower price and the fixed lower consumer price. The agricultural extension service provided by the government under the Agricultural Extension Service Law of 1948 helped the Japanese farmers in introducing the best possible agricultural methods, thereby achieving some of the highest land productivity, particularly in rice production, in the world.[18] Government extended help in all possible areas of agriculture like irrigation, drainage, marketing, finance, mechanization, and so on. The result is that Japan now has a problem of over-production of rice, not of shortage. The government is not liberalizing imports of agricultural produces despite international criticism because they like to maintain the maximum agri-production level at any cost as the means of their survival in any unforeseen emergency. This makes economic sense to them. Some side effects of agricultural policies are development in agricultural machinery industries and huge savings by agri-cooperatives for the supply of funds to various development areas through banking and postal savings system.

Creation of a dedicated and educated bureaucracy and conversion of government-business rivalry into active cooperation. "Japan, Incorporated—a Conglomerate" is a common term used in recent years to criticize or describe Japan's phenomenal postwar economic growth. The term implies a government-business cooperative relation in powering and steering the wheels of high speed growth economy of Japan. This may be further clear from an analogy drawn by Abegglen between "how Japanese economy works" and a giant multi-division company on the order of General Electric or General Motors:

> In this analogy, the Japanese government corresponds to corporate headquarters, responsible for planning and coordination, formation of long-term policies and major investment decisions. The large cor-

[18] Mustafizur Rahman. *Approaches to National Economic & Industrial Planning for the Developing Countries*. p. 27.

> porations of Japan are akin to corporate divisions, with a good deal of operating autonomy within the overall policy framework laid down by corporate headquarters, free to compete with each other within broad limits, and charged with direct operating responsibility.[19]

This analogy has its limitations and there may not be anything to criticize in Japan for its way of doing things and maintaining such close government-business relations. This relationship was not created just by an imperial order or by accident. It was developed through a process of social need and situational imperatives. As Chalmers Johnson says:

> Looked at historically, modern Japan began in 1868 to be plan rational and developmental. After about a decade and a half of experimentation with direct state operation of economic enterprises, it discovered the most obvious pitfalls of plan rationality: Corruption, bureaucratism, and ineffective monopolies... Thus, Meiji Japan began to shift away from state entrepreneurship to collaboration with privately owned enterprises, favoring those enterprises that were capable of rapidly adopting new technologies and that were committed to the national goals of economic development and military strength. From this shift developed the collaborative relationship between the government and big business in Japan.[20]

The issue of the famous "Outline Regulations for the Sale of Government-operated Factories" by the then finance minister Matsukata Masayoshi on 5 November 1880, coupled with his successful deflationary policies of cutting imports, lowering prices and creating foreign exchange surpluses, and balancing of revenues and expenditures, brought about a new economic climate wherein the new *zaibatsu* started crystallizing and the existing *zaibatsu* (family conglomerates) like Mitsui, Mitsubishi, Sumitomo, Yasuda, Furukawa, Okura, and Asano organized themselves to make big strides ahead to propel and economise with full understanding and practice of economies of scale.

During the Tokugawa period, the Samurai became administrative officials rather than warriors. The Meiji inherited this system. The Meiji leaders did not want to perpetuate Samurai government. They created a non-political civil bureaucracy initially with Samurai or

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[19] Abegglen, op. cit., p. 71.

[20] Johnson, op. cit., p. 23.

Samurai descendants. The bureaucrats of the prewar Japan were not liked, but they were respected. They were not civil servants, rather officials of the Emperor, appointed by him and answerable only to him. The Japanese normally did not question the authority of the government because of their respect for the Samurai sword.[21]

Things gradually changed after the Meiji constitution in 1889 and the postwar constitution of 1947. As Chalmers Johnson, quoting Yamanouchi, says:

> The change from the old constitution to the new, did little to change this attitude. For example the effectiveness of MITI's informal administrative guidance which left the western governments in confusion for years together in understanding working of the Japanese government is said to rest in the final analysis on this Samurai sword.[22]

Whether due to respect for the Samurai sword of prolonged feudalism or for other reasons, the Japanese had developed a respect for the authority of the government, and this is one of the reasons why administrative guidance works so effectively in Japan.

Unlike other countries, the bureaucrats took up their duties with missionary spirit. Their power and responsibility increased by many times as Meiji modernization progressed. Takahashi Korekiyo, an adopted son of a Samurai and educated in America, who became the first chief of the patent bureau in the ministry of agriculture and commerce in 1886, served as Minister for Finance in several cabinets and also served briefly as Prime Minister. He is considered to be "the Keynes of Japan" and the father of the policy of deficit financing in Japan.[23] He wanted to put the brakes on army expenditure to curtail inflation and the trade deficit. The army rejected this and assassinated him on 26 February 1936.

The social consciousness of agricultural bureaucrats was referred to as *Ishiguroism* after the bureaucrat-turned statesman Ishiguro Tadaatsu. During World War I, he and his followers imbued the ministry with a sense of mission to protect the small tenant farmer. He used to donate part of his salary for the cause during the 1930's.

The contributions of Shijo Takafusa (1876-1936), Yoshino Shinji (1888-1971), and Kishi Nobusuke (b. 1896), who started their

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[21] Johnson, op. cit., p. 40.
[22] Ibid.
[23] Ibid. , p. 119.

careers with MAC, were remarkable. Yoshino, who studied auditing courses in labour economics at Berkeley, and Kishi together are said to have established Japan's first genuine industrial policy. Kishi spent seven months in Berlin in 1930 reporting on the industrial rationalization movement, and his reports directly influenced the path it took in Japan.

The government-business relationship improved further when Yamamoto Tatsuo of the Mitsubishi Zaibatsu became minister of MAC in 1913. It is he who recruited Yoshino.

Even though occasional interministrial rivalries and rivalries between Zaibatsu and landlord groups persisted, nothing worked against the interest of the nation. When international recession in the 1920's created a bigger economical challenge, the needs for expertise and still closer cooperation between the government and business were called for, and it led to setting up a Commerce and Industry Deliberation Council on 23 May 1927, as a joint public-private forum to find out ways and means to take the economy out of the panic of the time. This council may be called the direct antecedent of the Industrial Rationalization Council of 1950 and its successor, the Industrial Structure Council—MITI's main official channel to the business community. This tradition of the deliberation council helped the Japanese government in subsequent years to have access to a wide spectrum of expertise, ideas, and wisdom available in this society to guide it. Until 1975, about 246 deliberation councils advised the government on relevant matters.[24]

Timely realization of the importance of long-term industrial policies and import of technology. During the last years of the Tokugawa era, such Western industrial plants as iron smelteries and foundries, munition factories, dockyards, cotton spinners and glassworks were set up, though mainly for military purposes.[25] The Meiji government not only inherited and enlarged them, it also set up a large number of industries under state ownership to provide models for a wide range of future industries. According to the *Kojo Haraisage Gaisoku* (Law on the transfer of factories) of 1880, the government sold out its plants to private entrepreneurs at a nominal cost. The list of such industries is too long to be given here. The range was quite large and the locations of the industries were scattered all over Japan.

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[24] Johnson, op. cit., p. 47.

[25] Takahashi Masao, op. cit., p. 71.

The selling out of government enterprises to capable business groups in the 1880's and the creation of a government-business collaborative relationship were probably the roots of subsequent industrial policies of Japan. Of course, the government did continue to take initiative in promoting important industries whenever it was found difficult for the private sector to initiate them for various economic or uncertainty reasons.

The establishment of Yawata Steel Works in 1901 followed by Kobe Steel Co. in 1911 and Nippon Kokan in 1912 put Japan on the gateway to heavy industries like shipbuilding and automobiles, machine tools, and so on which are now tough competitors in the world market. Although industrialization started with light industries like textiles, food, and the like, Japan never followed market guided policies. Yoshino went to America and Europe in 1924 to investigate the chemical industry and protective tariff policies. Kishi was sent to Berlin in 1930 to report on the industrial rationalization movement there. It is said, as mentioned earlier, that Yoshino and Kishi together made the first genuine industrial policies of modern Japan. A series of laws to encourage business in the desired industrial fields, to allow cartels, remove overheated competition, control import and foreign investment, and to promote export were introduced. Kishi said that German industrial rationalization, like the movement elsewhere, was devoted to technological innovation in industries, to the installation of the most up-to-date machines and equipment, and to generally increasing efficiency. Japan followed this, adding another point to it, that is to say, remove cut-throat competition.

The government established specialized national laboratories to carry out adaptive research and evaluate foreign technology, and encouraged private companies in introducing suitable technology to their growth area. Between 1949 and 1971 Japan imported some 12,000 cases of new technology at a total cost of more than ¥773,200 million of which 64 % were for equipment and machinery purchase. Many people term this a type of 'free ride' and criticize Japan. But their expenditure in research and development (2.29 % of GNP in 1979) is now quite comparable to the level of the USA and most EC countries, which is 1.98 % in France, 2.27 % in the UK; 0.92 % in Italy; and 2.50 % in the USA.

Import of technology needs the capability to select the right technology at the right price in addition to the capability to absorb it.

Government-business collaboration in the process was important in Japan. As Abegglen points out in Japan's case:

> A key factor in Japan's economic success has been the ability to select, absorb, and improve foreign technology. ...The methods for selection of technology from abroad, and the determination of a suitable price for it, are another example of the interaction in Japan between the government apparatus and the business community, with the bureaucracy in the role of a judge of overall national interest and arbitrator between conflicting business interests. The specific mechanism for government involvement in the process has been the regulations governing foreign exchange, applying not only to trade and investment but also to the importation of technology in whatever form and of course the flow of funds in payment . . . Purchase of technology has been integrated with plans and expenditures for domestic development, notably in such sensitive fields as electronics, computers and nuclear energy, through joint government-business committees on research planning for key product areas.[26]

There are many examples of how the government, particularly MITI, affected a number of technology transfers to Japanese firms under its terms. Chalmers Johnson points out the case of IBM which was indirectly told by a MITI officer, Sahashi: "We will take every measure possible to obstruct the success of your business unless you license IBM patents to Japanese firms and charge them a 5% royalty."[27]

Japan's policies towards automobiles, electronics, LSI, VLSI, and computers are paying off now, and the policy towards the aerospace and arms industries will probably put even the USA and the EC countries on the defensive in the future. The subcontracting and sub-subcontracting system that the government has been preserving is giving Japanese products a competitive edge both in quality and price. The distribution system through trading houses saves the smaller manufacturing companies a lot of promotional expenses and overheads. The government's policy of protecting the domestic market is criticized now, but the industries are already strong enough to face foreign competition which will not find it easy to penetrate the Japanese nationalism barrier, if not the traditional distribution channels, or network of non-tariff barriers. All these policies combined by made the industries grow and sustain themselves healthy.

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[26] Abegglen, op. cit., pp. 117, 121-22.

[27] Johnson, op. cit., p. 247.

Occasional military intervention in prewar economic and industrial policies. From feudal times, the military (*Samurai*) had been wielding all the power. The power of the military, though gradually limited to their profession, did not always remain confined, particularly because of the nature of the Meiji constitution. There were hardly any cuts in the military expenditure because of the high defense priority resulting from the long-standing Japanese distrust towards foreigners.

The bureaucratic administration during the Meiji and the post-Meiji periods was not always smooth. Inter-ministerial, inter-departmental or personal conflicts sometimes delayed many major decisions. Military intervention, even though leading to a series of wars, had some positive side effects the contributions of which were immense on prewar and postwar Japan. Some of these effects are the following:

- The promotion of the Yawata Steel Industries bill in 1896,
- Creation of a census board in 1920 (the industrial census data was the basis for modern industrial planning),
- Setting up of an economic planning unit in 1927, which pioneered the material mobilization plan,
- Sponsoring of the Resources Investigation Law in 1929, which required private enterprises to report to the government on their productive and financial capabilities,
- Helping Kogane in introducing the metric system in Japan as a way of standardizing industrial products in 1930, and
- Passing of the Important Industries Control Law in 1931, which led to, among others, petroleum, automobile, the steel (1937), machine tool (1938), aircraft (1938) laws designed to provide special governmental financing, taxes, and protective measures.

Various steps taken by the military or promoted with their help had lasting effects on Japan's prewar and postwar industries and economy. The five-year plan for Japanese and Manchurian industry prepared by the military (might actually have been prepared by Shiina and Kishi) in 1936 gave Japan a rare experience in practical planning. The National General Mobilization Law passed in April 1938 was more than an economic law, which actually authorized the complete reorganization of the society and oriented the

government bureaucrats towards solving problems by rational macro-planning.

Formulation of growth-oriented fiscal and monetary policies. As Japan did not have control over its tariff until 1911, the Meiji leaders had no other choice but to devise innovative fiscal and monetary policies to boost its economy, check inflation, keep trade deficit under control, and increase exports and desired production. Matsukata's successful deflationary policy of 1880, which is comparable to that carried out 70 years later by Joseph Dodge and Ikeda Hayato under postwar occupation rule, was innovative in its time. This led to the conception and adoption of a separate foreign currency and local currency budgets, which continued althrough until Japan's current account surplus started to grow over the last few years.

The policy of liberal financing of selected industries since 1881 has given birth to planned industrialization policies. Aggressive investment in the prewar and postwar Japan would not be feasible in the absence of government policy of keeping the interest rate on investment funds low. The development of government-bank-business ties, where the government guarantees loans by city banks to growing industries, was a rare device to nurture selective economic growth. The bold economic decision by Prime Minister Hamaguchi Osachi in 1929 to order a 10 % pay cut for all civil and military officials was a reflection of the serious handling of fiscal policies even against underlying protests and risks. The deficit budget financing for development introduced by Takahashi in 1932 is still an accepted method of budget planning in Japan and by now in the USA, and many other countries. Japan overtook other industrialized nations because it could adopt the deficit financing wisely enough to pull its economy out of depressions and recessions before other nations actually did so. The postwar economic policies are the direct extension of the prewar policies except for their complexities, scale, refinements, and establishment of new financial institutions like the Japan Development Bank, Export-Import Bank, long-term credit Bank, and so on and reduced defense expenditure.

Introduction of a rational taxation system and effective deferment of domestic consumption in favour of savings for productive investment. The tradition of living frugal lives for hundreds of years created a strong basic sense for the effective use of

money in the Japanese people, both in the government as well as in private management. The tax system developed according to the needs of the changed circumstances over the years could never undermine that basic sense. The tax burden in Japan is the lowest among the developed countries of the free world. Heavy taxes have always been abandoned in favour of cuts in the government expenses. This is reflected in the famous deflationary reform of Matsukata in 1880 when government expenses were brought under control by cutting government jobs, pay, and imports. Governments did not hesitate to pay respect to tax payers by allowing landlords with large holdings, seats in the upper house and House of Peers, simply because of the high taxes they paid. Takahashi came out with his famous deficit financing programme for development because a high tax was not considered for extra funding. Earnings from export were allowed a special tax exemption before the War, as well as after the War, although the occupation authority wanted to remove such preferential incentives. While industries grew substantially, expansion of domestic demand was found advisable by the finance minister, Ikeda Hayato, in 1956, who launched the policy of positive financing under the slogan of "*a hundred billion yen tax cut is a hundred billion yen of aid.*"

Immediately after the War, General MacArthur, with the help of his economic adviser Dodge, introduced the rationalization plan which called for a severe cut in the government jobs (about 10,000 officials were removed between 1949 and 1951 from MITI alone), a balanced budget, improved controls over foreign trade, strengthening tax collection, and so on. The Japanese bureaucrats implemented them apparently as per the orders but safeguarding the interest of Japan to the maximum wherever possible. Some commentators termed it as "seven years of bureaucratic *menju fukuhai*, following orders to a superior's face, reversing them in the belly."[28] In this rationalization process, the taxation system was greatly simplified, but the basic principles remained the same. During the high speed growth they included, on the protective side, discriminatory tariffs, preferential commodity taxes on national products, import restrictions based on foreign currency controls, and on the developmental side, and exemption of import duties of designed critical equipment.

[28] Johnson, op. cit., pp. 16, 43.

Japan still maintains one of the lowest tax rates among the industrialized countries even though its budget deficit has swollen to a high level. However, the government is now taking measures to reduce the deficit without increasing taxes, but through administrative reforms in the form of cutting 82,000 government jobs and converting the major government enterprises into private ones in five years. Prime Minister Suzuki and the then state minister for Administrative Management Agency, Yasuhiro Nakasone, declared in 1982 that, if necessary, they would risk their political career to bring about these reforms as recommended by the *ad hoc* commission headed by Toshio Doko (b. 1896), honorary chairman of the Powerful *Keidanren*, the quasi-official organ of the business world in Japan.[29] Doko himself was a symbol of Meiji-era frugality living with his wife within a monthly budget of ¥100,000 while earning well above ¥100 million a year, donating most of it to a private senior high school founded by his mother.[30] Making a man like him head of the commission, the government showed its concern for reforms.

The Japanese tax system is very responsible and rational to serve its purpose best. The lower tax combined with deferment of domestic consumption by other measures generated private savings available through banks or the postal savings system to respond to government deficit financing of development programmes and investment in growing industrial sectors all the way from the Meiji restoration to the present day. Efforts to correct its course to respond to the need of time were not absent. Yasuhiro Nakasone, who was then the Director General of Administrative Management Agency and later became the Prime Minister of Japan, spoke of the coming reform in his TV interview on 1 August 1982 as one comparable to that of the Meiji period and MacArthur's reforms.

The fact that Japan's administrative system is one of the most effective in the world is probably due to its rational tax system and responsible allocation of resources which compelled them to have the lowest ratio of administrative staff per thousand people employed among the developed countries (Table 5.1). There are enough forces in-built into the social and political system of Japan for self-correction and improvement.

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[29] Yasuhiro Nakasone became the Prime Minister of Japan on November 26, 1982.

[30] *The Japan Times*, August 12, 1982.

Table 5.1. Number of public employees per thousand employed population, 1976.

	Japan	France	USA	Germany FR	UK
Administration staff [a]	93	150	169	179	215
Defense force	6	22	36	26	24
Total	99	172	205	205	239
Foreign service total (no.) 1980	3,560[b]	6.801	13.601	6.118	10,037

[a]Administration staff includes government service employees, public corporations staff and local government employees. public corporations staff and local government employees. [b]Of this, 2.002 were stationed abroad.

Sources: Keizai Koho Center, *Japan 1981* ; *The Japan Times*, Oct. 21, 1981.

Expansion and protection of domestic market while expanding export drive. Japan's protectionist policies are now being criticized by the USA, the EC, and many other developing countries because of Japan's huge trade surplus with each of them. As a member of the GATT, Japan does not want to show it protectionist. It made its efforts to cool down the criticism by liberalizing imports of some harmless and uncompetitive items since the late 1960's. Initially, Japan did not grow on exports only. It had to export as much as it could to import industrial equipment, technology and raw materials, and not consumer goods. It effectively deferred domestic consumption until the production started flowing out from the new industries, and selective home demand increased to take the industries to full capacity to gain economy of scale while the labour wage was still low. Japan's products thus gained a formidable competitive edge. The USA or the EC overlooked this development until the end of 1960 when Japan had already overtaken the EC members in GNP. The situational motivation of Japan—late development, lack of resources, the need to trade, balance of payment constraints and so forth made it identify and apply the now familiar economic tools of discriminatory tariffs, preferential commodity taxes on national products, import restrictions, import quotas, supply of low interest funds to targeted industries, subsidies, duty exemption on critical industrial equipment, and many others. These protected the local market growing industries and strengthened the important industries themselves for subsequently competing in the international market explored by government organizations like the Japan

External Trade Organization (JETRO), which is now trying to help increase imports to take some steam off the present heated trade friction with the USA, the EC and the non-OPEC member developing countries. The government formulated a cluster of intricate legal frameworks to achieve Japan's economic goals while still keeping itself within the provisions of international laws.

The most important weapon is what is normally called the unwritten law of administrative guidance. Japan's Foreign Exchange and Trade Control Act of 1950, though relaxed to some extent in 1979, can keep any undesirable foreign investment off Japan's market. Even if foreign investment is permitted in some cases, the immigration law shall prevent the necessary foreign personnel from entering Japan. Expansion of the business may be virtually stopped by another set of laws. The EC and the USA are pressing Japan to free its market of the current network of non-tariff barriers. Even if Japan is to open up its market, it will not have to do it as the USA or the EC wants it to do, because it has got a lot of strength now to retaliate against unfair demand or pressure.

The future will show how Japan shall reap the benefits of these policies which brought her to this stage. As a new strategy Japan is investing heavily in the USA, Europe, Australia, Brazil, Indonesia, Mexico and in many other countries with large markets or vast resources. By 1991, direct investment had already reached US$352,392 million. This is a new opportunity for Japan in that neither the USA nor the EC has been alarmed too much by it as yet, and they are generally welcoming such investment for the time being. Japan is thus considering direct overseas investment seriously as a means of preparing itself against any renewed challenge with bills like the local content bills pushed by US Congress in 1980. Japan shall be able to expand her overseas market by changing strategies unless something unusual happens in the international economic or political environment.

Evolution of legal systems and institutions capable of monitoring and solving crises with keeping an eye on tradition. While Japan was still divided into 34 feudal territories, each under an independent *daimyo* and there was intense conflict between the opponents and supporters of the policy of isolation, when in November 1964 Major Baldwin and Lt Bird of HM 20th Regiment were assassinated at Enoshima by some Samurai. "As the law then stood in Japan, it was not a crime to kill foreigners, indeed it was

encouraged in some quarters", writes Neil Pedlar.[31] When the murders reached 30 the British Consul General, Sir Rutherford Alcock, demanded immediate action by the *roju,* Shogun's Senior officials, to track down and punish the offenders. This was the first time some action was taken, and it was publicly declared that murder of foreigners was a crime. In sharp contrast, today Japan boasts of having one of the lowest crime rates among the developed countries.

Meiji leaders built up their modern institutions with lessons or help from Britain, Germany, France, and the USA. The naval college instruction pattern was set by two British naval officers, Hawes and Brinkley, in 1872, who were joined by a mission of 33 men under Commodore A. L. Douglas in 1873. Starting with some British supplied vessels and gradually reinforcing them with new vessels built at Yokosuka under the supervision of French engineers, the imperial navy grew rapidly in size and potency.

The military was built up according to the German pattern. By 1920, military officers, like most other Japanese leaders and bureaucrats, were the products of an education system rather than a social class. After the Meiji Restoration, Tokyo adopted the British style police system of Yokohama, but the Ministry of Justice sent an 8-member mission to France, Belgium, Germany, Russia, Austria, and Italy to find models for the legal and penal system and courts. On studying the report, the government adopted the French police system which was improved from time to time.[32] The Japanese civil code, drafted with the help of the French adviser Boissonade, was adopted in 1898 with some changes in line with the German civil code model.[33] The Meiji leaders drafted the constitution with the help of German advisers, Friedrich Hermann Roesler and Albert Mosse, and presented it to Privy Council for a point-by-point discussion. It was finally proclaimed on 11 February 1889 as the Imperial Japanese Constitution.

Japan's legal system grew in complexity and precision along with the important institutions and *vice-versa.* The laws are mostly drafted by the executive branch for endorsement by the Diet. The laws are thus bureaucratic, but not irrational. In their view this is an

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[31] Neil Pedlar, "Capt. Francis Brinkley—One of the First Henna Gaijin", *The Japan Times,* August 15, 1982.

[32] D. Eleanor Westney, op. cit., pp. 310-11.

[33] Akio Yasuoka, op. cit., p. 32.

administration for the sake of the citizenry and this constitutes administration through law, which is different from the rule of law. The very fact that the legal profession is not too attractive in Japan reveals fewer legal disputes in Japan—in fact, much less compared to those in the USA or Europe which, in turn, speaks for the rationality and quality of the Japanese legal system. The people upheld the Meiji constitution of 1889 without changes until SCAP imposed its own constitution on Japan in 1947 which still continues to this day. Japanese bureaucrats did their best to conveniently amend the provisions of all the laws recommended by SCAP during its occupation. They availed every opportunity to protect the interest of Japan.

The legal system necessary to protect its domestic market, promote industries, maintain domestic law and order have developed over the years (some are already mentioned in the preceding sections). Japan, however, kept foreign labour and undesirable foreign investment out of its market by laws in keeping with her long tradition and accepted philosophy, despite foreign criticism. The legal system played its own vital role of supporting the economic growth in its most suitable legal environment. About 246 broad-based deliberation councils and some *ad hoc* committees are still keeping the system updated and useful for Japan's well-being. The complex interrelation between different protective laws may be manifested from the fact that the government had to seek in April 1983 amendments of 16 laws to relax just a part of the non-tariff barriers because of the US accusations of GATT and violations by raising deliberate non-tariff barriers against foreign products. Individual cases shall not be discussed here as this is a quite a large area of study and research in itself.

MacArthur's rationalization plan and American imposed constitution and security treaty. Japan's industries geared to War production and the foreign trade capturing world market prior to War suddenly dwindled when the Emperor broadcast his announcement of surrender on 15 August 1945. The ministries hastily started reorganizing themselves to remove possible evidences of their connection with War crimes before the first allied troops arrived. The Ministry of Munition was reconverted to the Ministry of Commerce and Industry by Shiina overnight. Allied investigators discovered the end-of-the-war juggling of ministries but they did not find it out of step with their direction of thinking. It soon became clear to the

Japanese that the SCAP had decided on an indirect occupation, leaving the Japanese government intact except for some changes here and there to be implemented through the Japanese government itself. The bureaucrats thought out probable changes and started protecting their interest before SCAP could realize its implications. The SCAP wanted to break up the *Zaibatsu* but they were reborn under the shelter of their banks which the Americans, as per their own conception, considered to be free from industries and commerce. As early as 15 February 1946 the cabinet had called for an emergency economic policy headquarters, which the SCAP also liked in some form. This led to the formation of the economic stabilization board. Before SCAP stopped payments of war claims, the government flooded the business with money. Even after the stop on 25 June 1946, they revived such payment through a new institution, the Reconstruction Finance Bank created on 24 January 1947. It is said to be one of a set of institutions that the Japanese created after the War to restore their economy to the prewar level. The priority production scheme for coal and steel production was taken up, which served its purpose though some inflation was created as a side effect. A series of measures were taken for economic recovery and control of inflation while foreign trade was still under SCAP control.

In 1949, General MacArthur presented a 9-point rationalization programme to be implemented by the Japanese government and deputed Joseph Dodge (hence also called the Dodge plan) to advise them in their efforts and to monitor progress. He compelled (or otherwise made) the government to write an overbalanced budget, to fix exchange rate at US$1 = ¥360, and to create the export-import bank, Japan development bank, and many other institutions which affected the Japanese economy for years to come. The sudden drastic curtailment of inflation, through a draconian reduction of demand and cutting thousands of government jobs created a deflation which was a prerequisite to Japan's economic recovery and growth. To control foreign investment by giant multi-nationals, Japan enacted a very important law, the Foreign Exchange and Foreign Trade Control Law. This law along with *Gaishiho* (foreign investment law) gave Japan the necessary legal weapons to protect the local market. However, the SCAP approved these laws probably with the understanding that Japan was going to allow import of technology and foreign investment. The SCAP gradually handed

over power of control of foreign trade and foreign exchange to the Japanese authorities. As Leon Hollerman puts it:

> In liquidating the occupation by "handing back" operational control to the Japanese, SCAP naively presided not only over the transfer of its own authority but also over the institutionalization of the most restrictive foreign trade and foreign exchange control system ever devised by a major free nation.[34]

The peace constitution of 1947 imposed by the USA and the USA-Japan security treaty gave Japan an umbrella of protection by the USA virtually free of cost. Japan's defense expense of below 1% of the GNP, compared to 17.0-50.9 % between 1940 and 1944 allowed her to divert all resources for investment to postwar economic growth which the USA itself is envying now.[35] The individual steps or measures of the SCAP that helped Japan directly or indirectly are not analyzed here, but it can be concluded that the postwar Japanese economy would have been absolutely different if the SCAP had not allowed Japan almost a free hand to amend its own policies and deploy her prewar economic lessons to the modern institutionalized economy. The US not only took the defense burden but also allowed Japan access to her vast home market. Had it not been for the USA and its EC allies' permissiveness to Japan's export and protectionism, Japan's economic development could have had a different growth pattern. Now both the USA and the EC have realized their early underestimation of Japan and are trying to correct their vast trade deficits. Whatever may be the present US reaction, the fact remains that the Dodge plan, the Peace Constitution, and the USA-Japan security treaty contributed heavily to Japan's economy.

Identification of national interest and attachment of top priority to it continuously in all changed circumstances. The adoption of the policy of *Sakoku* in 1639 was as important as its relaxation in 1854—the former for Japan's avoiding colonization and the latter for its modernization. The setting up of military institutions during the Meiji era was as important as the build-up of other government institutions—the first one for its maintaining sovereignty (though there were abuses of its overgrowth against China and Korea) and the second for its economic growth. The priority to education, import of technology, setting up of modern industries,

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[34] Johnson, op. cit., p. 159.

[35] Takahashi Masao, p. 137.

deferment of domestic consumption in favour of savings, rational taxation policies, and so forth were undeniably in the interest of Japan, and she could identify them long ago. The introduction of government-private deliberation councils as early as 1920 and their continuation and growth in numbers are making a wide spectrum of wisdom available to the government and the society to tackle crises confronting the nation any time. The juggling with the SCAP rationalization programme and related laws by the Japanese bureaucrats could not allow the SCAP to take any advantage of their occupation. On the contrary, Japan derived maximum benefits out of the US spending in Japan and in Korea apart from her access to the vast US market. As export earnings soared so did Japanese investment in the 1950's and 1960's. The yen became too strong, while the dollar was getting weak though still under a fixed rate system tied to gold.

In August 1971, the US President Nixon announced his dollar saving package—a 7% devaluation of dollar, non-convertibility to gold and a 10% surtax on imports. The next morning there was a panic in the Japanese stock exchange mart. The value of most of the stocks went down by about 50 % in a matter of hours. This was the unforgettable 'Nixon shock' to the Japanese. Japan, in fact, overreacted. The stock prices rebounded and exceeded the previous level within a few months. The heavy investment in industries, technology and research and development in 1960 gave Japanese products a much more competitive edge than the package measure could nullify. The 'Nixon shock' rather encouraged the Japanese to invest heavily in key industries, high technology industries, resource development abroad and in research and development. This helped them overcome the OPEC oil shock of 1973 and the following years, much more smoothly than any other country in the world.

The US$18 billion trade surplus with the USA in 1981 (Japan's total export in 1981 was US$152.1 billion), ever increasing exports of automobiles, electric machinery, steel products, TVs, VTRs, robots, computers, NC machine tools, personal computers, VLSIs and many high technology products are not accidental achievements. Japan is continuously working for its development towards targets clearly known to her. The necessary political will is always available to support the drive for the achievement. The stringent automobile pollution law (Muski Act) of the USA once frightened the Japanese auto industries and the government alike that they might not meet the condition and might thus lose the US market. However,

they made their utmost efforts and succeeded, while the US government had to relax its conditions due to the failure of the US's own automobile industries to meet the conditions without a great cost increase.

The irony is that the Japanese government has imposed much more stringent conditions on exhaust gas, which most foreign automobiles cannot meet within a competitive cost. Japan could technically keep the foreign automobiles out of their market without provoking retaliation because of this very measure. Situations change, but they don't want to relax their efforts to adjust their moves accordingly.

People might again be surprised to see Japan occupying a leading position in arms technology, aerospace technology, biotechnology, nuclear technology, fibre optics technology, new materials technology, and other high technology areas which have so far been the monopoly of the USA, Canada, EC, or the USSR. This will not come just by chance. This will be the natural result of what Japan is doing today to this end. The recent break-down of the USSR and the end of the coexistence of the Superpowers will probably give Japan a new opportunity for her growing in strength, both politically and economically.

Effective methods of handling labour resources. The productivity of Japanese labour has been one of the highest in the world, while labour disturbance is negligible except for some ceremonial or ritual types of strike, or threats to strike around April every year. Western people find it difficult to understand why Japanese management is successful compared to theirs, while Japan imported the institutions and technology from Europe and the USA during the Meiji period and thereafter. Japan did import the institutions but not to use them as they were.

Craig proposes that the 1930's saw the "indigenization" of the values and institutions that had been borrowed from the West during the Meiji era.[36] The loyalty of the Japanese to their boss or employer dates back to the feudal ages. The Samurais were not simply obeyed, they used to be respected. The recovery of two imperial soldiers from the jungles of Guam and the Philippines, 30 years after Japan's surrender and still in fighting spirit, is an example of loyalty probably without any parallel in history.

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[36] Johnson, op. cit., p. 40.

However, the loyalty is not one-sided; the Japanese bosses or management have always been caring towards their subordinates or employees. Modernization puts more rationalism into this relation and tradition. Workers now have a higher and higher basic education in colleges and universities, and they are given special training by employers on recruitment and long on-the-job training thereafter. For the company, the new recruits are the new members of their family and for the workers the company is the place of their lifetime work. The companies hardly consider layoff or discharge as a means of bailing them out during recession. The subcontracting system and sub-subcontracting system help them a lot. In extreme cases, they are ready to diversify their works, and the employees are ready to re-educate themselves in a new trade even at an older age. The bonus system that provides the employees twice a year bonus equivalent to 4 to 8 months' salary helps the employees save money. The company loans provided for buying houses in instalments keep the employees grateful to them.

The age and length of service are two important factors that determine the yearly salary increase and bonus. A man serving longer in a particular company shall draw more than anybody joining it later with higher qualifications, with some exceptions. This also help strengthen the tradition of life-time employment. Many instances of the presidents of small and medium companies committing suicide are seen even now, to take responsibility in case of business failure and failure to safeguard the interest of their employees. A trend seen recently are changes in this tradition, but the tradition still prevails and is likely to continue long even if changes continue.

Western management uses mostly financial incentive to create necessary dedicated employees, but Japanese management does not use financial incentives as the only weapon; on the contrary, they consider their traditional package as the major management tool.

Constant changes in technical staff create a great problem in developing new technology, improving over existing ones, retaining imported know-how, and maintaining industrial secrecy which are of immense importance to any growing industries. Japan's life-time employment practice gave the Japanese company this advantage. The 54-hour work week in the past and the 48-hour work week at present (it is the legal limit but the larger companies practise around 43- to 45-hour per week), coupled with higher productivity by the average worker without overtime and much more work by higher

management people, are some of the accepted norms here. The government and private people work with almost the same spirit without complain.

The modernization, automation, or robotization of production lines is not a threat to the Japanese labour force. Unlike elsewhere in the world, they are not at all alarmed by the rapid introduction of intelligent robots which has risen to about 100,000 units as of 1981, about 70 % of the world's total. The industrial robot population in Japan as of end of 1990 is 274,210 compared to 41,304 in the USA and 28,240 in Germany. They are confident this will strengthen Japan's competitive position, which will open up new jobs. Japan's development would remain a dream if the labour resources, in fact, the only genuine Japanese resource, could not be handled in this way. The whole world is now rather enviously studying labour management in Japan as a possible model for accelerated economic development. It remains to be seen whether it is practicable elsewhere.

Effective control of foreign capital investment in Japan and import of technology. The apparently successful operation of Nestle, IBM-Japan, Coca Cola Japan, Otis Elevator, Fuji Xerox, and a small number of other foreign affiliated firms or joint ventures could not distract researchers from the fact that Japan very tactfully kept the foreign investment out of its market to safeguard its own national interest. The postwar Japanese companies have owned a capital ratio of 16-20 % while it is unthinkable in the West that the industries can grow under such a debt burden. The government managed to keep the interest rate low enough for the growing industries. So, it is quite natural for Japan to protect these industries from more resourceful foreign competitors. As James C. Abegglen writes:

> The restrictive rules and regulations governing investment in Japan today have their roots in the country's insular traditions. They also grew out of the feeling on the part of the Japanese businessman—representing both large and small companies—that Japanese industry is not strong enough to maintain independence and resist the enormous resources and know-how of Western companies, should the latter be given free reign in Japan. In approaching the joint venture with foreign interests, the Japanese businessman, backed by his government, hopes to gain as much of what he needs as he can manage while giving as few concessions in the area of management control as possible... he sees the venture as a short-term means of allowing him to exploit some specific piece of Western technology.[37]

[37] Abegglen, op. cit., pp. 103-104.

On the same subject, Chalmers Johnson says:

> Before the Capital liberalization of the late 1960's and 1970's, no technology entered the country without MITI's approval; no joint venture was ever agreed to without MITI's scrutiny and frequent alteration of the 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 the industry involved was scheduled for "nurturing".[38]

Since the enactment of the Foreign Capital Law in 1950, the MITI has been applying it virtually without any relaxation. Even if it has to permit some undesirable investment under the US or the EC pressure, its scope of operation will be restricted and the immigration authority might restrict the entry of necessary manpower. Criticisms are afloat against these practices, but Japan managed to keep herself free from multi-racial problems, intrusion by foreign workers, and unpatriotic or unrestricted competition by foreign business giants. The effectiveness of Japan's measures is such that the direct foreign investment in Japan as of 1980 was kept at a nominal level of just US$2,979 million, a figure about one-fourth of what Japan is investing in a single year now after she has gained economic power and a favourable international investment market. The investment that Japan has allowed so far is mainly in ventures where there is substantial Japanese equity though with some exceptions.[39]

Prevalence of rationality and prewar-postwar continuity in national development system and leadership. Japan did not achieve so much without facing problems. The situation that led to *Sakoku*, the withdrawal of *Sakoku* with an unequal treaty, the increase in corruption in the 1880's followed by depression, the rice riot of 1918, the economic recession of the 1920's, the devastating Kanto earthquake of 1923, militarism since the late 1930's, defeat in World War II, the economic recession in the late 1950's, the 'Nixon shock' of 1971 and the oil shock of 1973, and the following years were some of the major crises that Japan faced and overcame. Each crisis taught them new lessons for overcoming similar crises; each

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[38] Johnson, op. cit., p. 17.

[39] Keizai Koho Center, *Japan 1982*, p. 26.

crisis gave birth to new institutions; each crisis begot new laws and each of the crises strengthened their nationalism and rationalism. The MITI which is virtually the caretaker of Japanese industries and their growth and which is responsible for steering the wheels of growth to the desired direction is the outgrowth of the old MAC of 1881, which was split into the Ministry of Agriculture and Forestry and the Ministry of Commerce & Industry (MCI) in 1925. The MCI, however, was converted to Ministry of Munitions in 1943, which was again converted into MCI just one day before the arrival of the first contingent of the Allied troops after Japan's surrender on 15 August 1945. This continued until it was reorganized to form MITI in 1949 to implement MacArthur's stabilization plan.

The main personalities mentioned earlier, such as Yoshino, Kishi, Yoshida, Ikeda, and many other MAC or MCI, or MITI officials were virtually the same people who actually guided the development of Japan in some of the prewar and early postwar periods. Former Prime minister S late Eisaku Sato, and Takeo Fukuda, and many other elderly politicians and business leaders of the present-day Japan are no less strong links in the development process both before and after the War. The rational policies, the supporting institutions and the dedicated people behind them provided Japan a striking continuity in the development efforts and process leading to her phenomenal achievement today.

We have already seen a continuity of policies among Oda Nobunaga, Toyotomi Hideyoshi, and Tokugawa Iyeyasu, who established the Tokugawa Shogunate which continued in power for about 250 years before the Meiji restoration. The Tokugawa family was not eliminated by the Meiji government, rather the members were given due titles and made part of the new nobility in the Meiji period. The use of Tegata and other negotiable documents, as well as many commercial practices of the Tokugawa era are still the Japanese way of doing things alongside the highly modernized institutional practices. So, a continuity of system and leadership can be easily traced back from the pre-Tokugawa era to the present day. This is definitely a strength of the Japanese society characterized by group behaviour, not properly understood by many outsiders.

Chapter 6

MODELLING OF JAPAN'S DEVELOPMENT PROCESS

From the study and analysis of Japan's development process made so far, the driving forces behind Japan's economic development could be ascertained as given in the preceding sections. To study whether the Japanese development process is adaptable to any other developing countries in a different time-frame and under enormously changed international and national environments, it may be necessary to first generalize the factors or the driving forces behind Japan's economic development in terms of the present-day techno-economic and econo-political practice and behaviour of the nations under influences of the external and internal forces different from those prevalent during the early stages of Japan's development. This generalization shall be termed as the modelling of Japan's development process and will be used later to compare with the similar factors in some other developing countries. For ease in study, the factors are grouped into the following broad areas:

- Situational motivation and historical background affecting economic development through fixation of objectives;
- consensus in pursuing the objectives of development;
- Natural advantage and disadvantage;
- Policies and strategies for development;
- Stability, continuity and leadership; and
- International environment.

If the starting point of Japan's development process is fixed in the early Tokugawa era, it may be safely said that Japan was a

quasi-feudal state living in peace and hardship in the beginning. It was not comparable with any country in the West in economic condition. If Japan's development process is taken up from the end of *Sakoku* in 1854, Japan was still an agricultural country barely producing enough to feed her 30 million people, about one hundred years behind the advanced Western countries in science, technology, and economy. Compared to Egypt, China, and the South-Asian subcontinent, Japan was in a very early stage of so-called modern civilization. The incidents leading to *Sakoku* in 1639 and its opening in 1854 demonstrated and strengthened Japan's xenophobia towards foreigners. Meiji Japan's objectives of a "rich country and strong army" were pre-determined by the circumstances. Despite some minor power struggles in the early years of the Meiji regime, the nation had a consensus behind the Meiji objectives. The situational motivation like poverty, late starting of development, visible difference with the foreign power and availability of a backlog of technology in the West helped Japan find her strategies to achieve her objectives. Japan did not have any foreign debts at that time. She learned how to live within her own means during the 215 years of *Sakoku*. Her wants were limited.

The motivation to build a "*rich country and strong army*" was so strong and the changes were so sweeping that the new institutions introduced by the Meiji government did not inherit the dangerous vicious circles that are standing in the way of development among the developing countries of today. The police force, known for their corruption in the developing countries, proved to be so dutiful in Japan that they enjoy public confidence till now. The legal system has been perfected to a degree that the crime rate is even today low and the whole legal profession is not economically alluring in Japan.

Japan's labour force was loyal, and despite rapid industrialization and importation of many institutions from the West from the beginning of the Meiji period, Japan delayed importing foreign labour. So far Japan's labour force has never showed any instance of disruptive behaviour that have put Western industries in economic and social problems, time and again. In short, a serene labour situation has helped Japan's industrial growth from the beginning of its industrialization. Even though there have occurred global recessions, now and then, Japan has maintained a full employment policy and a policy of employing highly efficient robots. Japan's unemployment rate of 2-3 % for many years, compared to 5.3-15% in the West, has not

only been low, the labour unions are not seeking higher wage increases as before, to give a competitive edge to their industry in the international market.

Japan enjoyed some privileges of colonies after winning wars against her neighbours before World War II. World War I also allowed her an export boom to strengthen her economy. World War II inflicted damages to her industrial facilities and economy. The Allied Powers, however, changed their attitude towards Japan soon, and it was given a free hand to manage its affairs in 1952. Even before 1952, the SCAP policy was rather helpful to Japan. The postwar development was the outcome of her efforts with precise strategies in a favourable international environment with peace for herself. The Tokugawa regime continued for about 250 years after 1603, followed by the Meiji, Taisho, and Showa eras. Most of the postwar period has been ruled by the Liberal Democratic Party. Japan's Meiji constitution of 1889 continued until the end of World War II when the USA imposed the present constitution. Thus Japan enjoyed political stability and continuity of policies which gave cumulative benefits of all development efforts made so far.

Japan's development strategy was precise, effective and comprehensive. The development policy of Japan was based on industrialization. Its agriculture could support her industrialization in the early stages. The high rate of savings and an extremely high rate of capital formation that boosted industrial production could be possible because of the successful deferment of consumption. The industrialization was broad-based but selective and was nurtured by the government under necessary protection.

The government-business cooperative relation has allowed the government to have access to a wide spectrum of wisdom in different sections of the people outside the government. To maintain a viable and competitive position for Japan in the high technology field, government has been carefully guiding and supporting its prospective industries despite foreign criticism. It has been giving utmost priority to education as a tool for national development. Japan never liked to rely on foreign capital for her economic development, and reliance on her own resources made her development broad-based and well-adjusted to tradition.

Japan was also lucky in the sense that she did not have to bear the burden of her postwar defense expense which had mounted to about 50.9 % of her GNP in 1944. Japan's defense expenditure is

below 1% of her GNP now. The defense expenditure of Japan was US$11.50 billion in 1981 compared to 185 billion for the USSR; 171 billion for the USA; 26 billion for France; and 25 billion for West Germany. The defense expenditure however rose to US$28.73 billion in 1990, but still remained at 1.0% of her GNP. The USA, which has been protecting Japan since World War II, has realized recently that Japan was taking advantage of the US-Japan security treaty. But it is already too late. Japan can now bargain strongly in the face of any US pressure, although it sometimes shows modesty to avert US pressure on Japan's huge trade surplus. But it may now rely on its own arms industry for a defense build-up which the USA is encouraging.

Japan, which has protected its investment market so far, has been welcomed by the USA, the EC and other countries to invest there. This was a new opportunity for Japan which she has exploited in the most favourable terms. Japan is taking over existing companies, investing in new plants, and mining in all prospective parts of the world. Fuji Bank's takeover of two commercial lending subsidiaries of the Walter E. Heller Corporation for US$425 million is one of the biggest single takeovers in the USA by a Japanese bank.[1] Most of the Japanese banks, security companies, manufacturing, and trading companies are well entrenched in the USA, the EC, and in many other countries of the world. Her total foreign investment as of 1991 is US$352,392 million. This is probably not the end, but only the beginning of Japan's strategy. One cannot, however, imagine a similar takeover in Japan by any foreign interest whatsoever.

Japan's efforts to be technologically independent have paid off. Her technology is being sought even by the USA and the EC. Japan's history as a developed country is too short and as such she still has full vigour to take pains of structurally changing her industries and working out long-term strategies while deferring social development as far as possible. Even after achieving economic power, Japan has maintained her policies and spirit as a developing country to take economic advantage wherever available.

As the developed countries of the West attained a high standard of living long ago, which Japan could hardly think of due to her various limitations, they relaxed their efforts. Japan silently made its way to oust them from the international market gradually. Japan is

[1] *The Newsweek*, March 28, 1983, p. 33.

now enjoying a healthy and enviable trade surplus with almost all non-OPEC member countries.

Japan's population growth rate in the postwar period was maintained at about 1 % or less on an average. A large number of Japanese have settled in Brazil, the USA, and in many other countries while she maintained a virtually closed door policy to foreign immigration for jobs in Japan. The number of Nikkeijin (persons of Japanese parentage) in North America grew to 714,530 as of 1 October 1981. The number of such Nikkeijins was 763,693 in the South America. In addition, a large number of Japanese are staying permanently in different parts of the world. Their number was 246,142 in 1981. About 204,731 Japanese were taking prolonged residence abroad as of 1981. The number was 663,100 as of 1 October 1991. The total number of Japanese emigrants as of 1 October 1981 was as high as 4,006,388 compared to the total number of immigrants (mostly for a short time) at 1,552,296. The number of registered aliens in Japan as of 1981 was just 70,005 excluding the Chinese and the Koreans. As Japan brought in many Chinese and Koreans to work in Japan, while those places were under Japanese control, their number was comparatively large.[2] Before the War, over three million Japanese were living in Japan's colonies.

Japan's policy, strategy, and efforts to achieve her objectives have been highly rational with an in-built capacity to monitor and direct its course to serve its purposes best. The strong nationalism of the Japanese played an economic role that can probably be best performed by active nationalism alone in the right environment.

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[2] Keizai Koho Center, *Japan 1982*, p. 75.

Chapter 7

ADAPTABILITY OF JAPAN'S DEVELOPMENT PROCESS AND ELEMENTS OF ITS THREAT TO GLOBAL ECONOMIC ORDER

ADAPTABILITY OF JAPAN'S DEVELOPMENT PROCESS

It has already been shown in the preceding chapters that there is nothing miraculous in the Japanese economic performance. Japan's development has been based on rational policies and action-oriented strategies, favoured by a virtuous circle rather than opposed by a vicious circle.[1] It would have been surprising had not Japan developed herself under those policies and in the given environment. We have seen how a set of rational policies and strategies, explainable in economic and social terms, worked collectively as a system to give Japan a rapid and massive broad-based economic development. It may now be appropriate to proceed to analyze some of the present economic and social conditions in a few developing countries to see whether Japan's development process is adaptable to them.

Since elaborate discussion is beyond the scope of this work, the study is limited to a few important aspects only. The economic and social conditions of one of the poorly developing countries, namely, Bangladesh shall be discussed as an example to see whether Japan's development process may be adaptable under changed circumstances. References to the policies and achievements of a few other developing countries or newly industrialized countries shall be made at appropriate places to broaden the scope of the study of adaptability of Japan's development process to other countries.

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[1] Okita, op. cit., p. 112.

On the question of adaptability of Japan's development process, most decision makers in the developing countries had a rather common view until recently that Japan's process would not be adaptable to their countries because of poverty and lack of technology. They were mostly allured by the slogans of labour-intensive industries, agriculture first, appropriate technology, freedom from hunger, mass literacy, population control, checking of malnutrition, rural development, and the like which required loans, or grants from different international financing bodies. These slogans, however, could not misguide all the developing countries all the time. The developing countries did not necessarily have the same problems. The stages of development or the availability of resources, or the extent of seriousness of any particular problem in different countries have been different and need different packages of strategies. The countries which wanted to understand the implications of those slogans and find a way out earlier found Japan as a reference rather than the countries in the West. Taiwan, South Korea, Brazil, Singapore, Malaysia, and a few other countries got some positive results by learning from Japan. China and other communist-block countries have also been keeping their eyes on Japan's development process, particularly in the industrialization process. The ASEAN countries openly admit their policy of learning from Japan.

The high rate of growth achieved or being achieved by the newly industrialized countries trying to follow Japan suggests, Japan's development process may be adaptable to other countries. The fact that the most successful of the developing countries, namely, Taiwan and South Korea, were former Japanese colonies suggests that emulation of the Japanese development process may be better achieved if the motivation together with the strategies behind the Japanese development is transplanted. China and Russia had suffered at the hands of Japan (and other Western countries) and, as such, their motivation for development brought about results under a different system but through industrialization like Japan.

The people who tend to think that Japan's process cannot be adapted to the developing countries of today have probably reached this conclusion by the difficulties in finding a common time-frame in which Japan and any particular developing country could be compared. The population has increased too rapidly in the developing countries, while dependency on foreign assistance has become a common disease. While Japan was in the developing stage, many

amenities and industrial products thought essential today were not there to induce a new demand even after Japan ended its policy of isolation. The international environment is not now the same as the one Japan experienced in its prewar and postwar periods. There are many differences in the conditions that prevailed during Japan's developing stages and those prevailing now. So a simple conclusion as to whether the Japanese development process is adaptable to developing countries or not may be misleading. Policy measures essential under all developing stages, some prerequisites to development, and the advantages and limitations of a typical developing country like Bangladesh, with reference to similar factors in Japan, shall be discussed to find out the possible extent of adaptability of Japan's development process there and other developing countries.

Bangladesh was a part of the former British Indian colony until partion in 1947 into Muslim Pakistan and Hindu India. It was East Pakistan from 1947 until it became independent from Pakistan as Bangladesh in 1971. Many Southeast Asian countries progressed faster than Bangladesh, though they also gained independence around the same period or, in some cases, even after 1947. Japanese colonies got independence after its defeat in World War II in 1945.

The inner urge of the people to be independent from the British generated a sense of nationalism among the people of East Pakistan. But this nationalism did not lead them to any economic achievement.[2] When the people of East Pakistan realized that the government, usually led by people from West Pakistan, was neglecting East Pakistan, political agitation to remove economic disparity between the two wings of Pakistan began soon after independence. This agitation climaxed in the formation of the independent state of Bangladesh. People were united and conscious of the independence as an outcome of a bloody struggle for economic emancipation. So Bangladesh was born with a motivation and objectives no less strong than those which made the Meiji leaders initiate modernization of Japan.

After the first independence from the British rule in 1947, the quality of leadership the country had was naturally of a level below what was necessary for leading a nation to prosperity. There was an

[2]The Indian subcontinent was a British colony that gained independence as two separate countries of Pakistan and India in 1947. Present Bangladesh was the Eastern Province of Pakistan, normally called East Pakistan till 1971, when it got separated through a War of Independence as a sovereign independent state of Bangladesh.

established bureaucracy that had been serving the interests of the colonial rulers. The police system was to guarantee the smooth rule by the colonial power under a legal system, which was not meant for national development. Government liberally granted perquisites to high civilian and military officers, mostly drawn from West Pakistan, and thereby built an oligarchy. Landlords had established a contrasting and economically stratified social structure during the colonial rule. The colonial policy of earning land revenue through landlords and indirect taxes, mainly custom duties, along with coercive income tax laws and a bad legal system were passed on to the newly independent country of Pakistan. The landlord system was abolished later, but most other policies and systems, like dependence on indirect tax system, a bad legal system and the system or practice of deliberate negligence to large-scale effective education, continued unchanged. Even today primary education has not been effectively made compulsory. The legal system has not been changed to fit a free nation and to create an atmosphere for starting genuine development with necessary motivation.

Although Bangladesh had a strong motivation and nationalism during its first independence in 1947, as well as its second independence, or liberation in 1971, she could not utilize the factor as a driving force for her economic development as Japan did after the Meiji restoration. The reasons for the failure to use these important factors for preparing a nation for economic growth were many. The population density in Bangladesh in 1947 was about 345 persons per km^2, much higher than even the population density (as of 1980) of 309 persons per km^2 in Japan.[3] The population density of Japan was about 91 persons per km^2 in 1865 and 274 persons per km^2 in 1970. The population density of Bangladesh as of 1982 was about 648 persons per km^2, more than double of Japan. But, as about two-thirds of Japan's area are covered by mountains, Bangladesh should not find itself in a disadvantageous position in comparison with Japan in cultivable area. Two crops, in many areas three crops, are easily grown in a year in Bangladesh compared to normally one crop a year in Japan. The large population does create a high pressure on land, but Bangladesh has not yet crossed into the danger level. Land productivity is still less than half of Japan.

[3]The area of Bangladesh is about 143,328 km^2, while that of Japan is about 378,000 km^2.

Forty percent of Japan's agricultural produces used to go to the ruling *daimyos* and *Samurais* during the Tokugawa era which, however, kept the population growth in check. A self-reliant, though somewhat stagnant, economy was maintained by the Tokugawa regime throughout the period of isolation. In contrast, Bangladesh cannot produce even now enough foodgrain for herself and 40 percent of her agricultural produces cannot support the living of government servants, including army and police, and city dwellers at the present high level of standard.[4]

The *daimyos* could not borrow from foreign sources. As such, there was no possibility of sinking the country in foreign debts. But since the time of East Pakistan, the leaders here favoured the easy path of resorting to foreign loans. Even after 1971 independence, the so-called first 5-year plan of Bangladesh was made with the hope of covering 77 percent of its outlay from foreign loan. The 1978-80 two-year plan was based on 64 percent foreign assistance, while the 1980-85 second 5-year plan was expecting to cover 54.23 percent of expenses from foreign aid. Bangladesh, like many other developing countries, has already entered into the problem of over-borrowing and heavy burden of foreign debt servicing.

Government was planning to extend rural electrification with foreign loans. Rural electrification has been naturally dramatically increasing domestic energy demand and, consequently, government was forced to import uneconomical electricity generating facilities, distribution equipment, and the energy itself. Once power lines are extended in some areas, government continues it for political reasons even if its economic adverse effect is realized. Government might have its own reasons for such priorities, but for long-term national development such priorities may be considered to lack strategical prudence when the resource constraint of Bangladesh is taken into consideration. Like Japan, Bangladesh could adopt the policy of ensuring supplies to industries first by deferring domestic supplies during which local production of distribution equipment, household appliances and so on could be started properly. The supply of electricity is definitely a need, but like any other consumption, it must be deferred until the economy is strong enough to support it.

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[4]The standard of living for the high ranking people in terms of floor area of housing, transport equipment, standard of food, period of leisure, number of household servants, etc., when compared with those enjoyed by people of similar ranks in many other countries.

Japan did not have this problem in her initial modernization programme in 1868, as even electric bulbs were not available then. The first usable electric bulb was invented by Thomas Edison in 1869, and Japan has electrified its factories on a priority basis since 1880s'. Japan's installed bulbs numbered only (including those in factories) about 21,000 in 1890. This gradually rose to 54,083,000 in 1940.[5] Japan has always maintained a higher price for domestic electricity and a lower price for electric power for factories. The price differential was 88.9:55.6 in 1925; 105.9:29.4 in 1935, and 112.4:37.6 in 1940.[6] One might argue such policies allowed industries or some industrialists benefit at the cost of the consumers. This argument may be valid for a nation which is rich in resources and has reached a stage of economy that is unaffected by foreign competition.

Like Japan in late nineteenth century, Bangladesh has neither reached a strong economic level now nor has it any significant resources. So, deferment of avoidable consumption could be a key policy measure for Bangladesh, which she is not adopting for reasons known to her in favour of going into foreign debt without building an industrial base. The policy of Bangladesh seems to be keyed to "tackling immediate problems" rather than keyed to long-term industrialization with her own resources out of savings made by deferring consumption in sharp contrast to the policy of Japan during her early period of development.

Many people believe that Bangladesh cannot progress because the private sector does not have much capital. The government cannot initiate development because of its small revenue earnings and notorious inefficiency of the public sector. Japan also had similar problems in her early stages. Even now the ratio of owned capital to equity for most businesses in Japan is about 16%. Japan managed its development funds through a package of policies of resorting to deficit financing, a lower discount rate, strict control on banks in respect of prime rate (0.25% above discount rate), low income tax and encouragement of selective growth in targeted industries. Japan's domestic industries were protected by tariff and complicated non-tariff barriers, and encouraged by subsidies and liberal loans. Bangladesh is speaking of industrialization, but her policy of high

[5] *The Japan Times*, April 30, 1983, p. 3.

[6] Minami, op. cit., pp. 299-325.

interest rates of about 11-20 percent on loans for capital equipment and industrial raw materials, and high tariff on basic raw materials is virtually an anti-industrialization policy when compared to the policies Japan followed. The industries which somehow came to existence are now collapsing under those policies, and presently those are also termed as deindustrialization policies.

Technical education, essential for creating skilled labourers and researchers for rapid industrialization, has not been given due emphasis in Bangladesh. There is still only one engineering university covering only a few disciplines and a few engineering colleges and technical colleges, but the education lacks proper practical and research orientation to generate working skills.

Industrialization needs the support of research and development efforts. Bangladesh has not been producing enough scientists and engineers for that purpose. Despite having a population of about 120 million, Bangladesh has only 30,000 scientists and engineers (as of 1980, it may be a little higher now) which cannot cater to the need of research necessary to launch full-fledged industrialization. Japan already had 91,000 researchers in 1962; and 172,00 researchers in 1970. The number of researchers reached 769,696 in 1990.

It seems Bangladesh is encouraging foreign investment and joint venture for industrialization and possible development, which Japan had carefully avoided despite foreign criticism. A useful joint venture can be possible with a party which is already in industries and has enough financial resources to be equal with the other party. Bangladesh has not yet built the basic minimum core of industries, so it is not understandable why Bangladesh has been taking such a policy prematurely.

Japan's policies since the early Meiji period to the present day have enjoyed a striking continuity despite temporary distortion during World War II and immediately after it. The Meiji constitution of 1889 continued till the time when the US-introduced constitution was adopted in 1947. This constitution is still continuing to this day unchanged. Bangladesh never experienced any continuity in policies for any substantially long period. Japan benefited from the continuity of its policies while Bangladesh suffered from frequent changes in policies. South Korea, Indonesia, the Philippines, Taiwan, and Singapore have enjoyed political stability and continuity in policies for fairly long periods, and they tried to follow Japan's policies of development. They have managed to achieve substantial develop-

ment to be placed on a higher category of developing countries, or with the rank of "newly industrialized countries" quite rapidly. These countries, particularly Singapore, are now trying to emulate Japan's "*Koban system*" (police box system) of policing to maintain an effective social environment for economic development. Japan, which emulated the French police system in the early Meiji period, has since improved its system to the level of one of the most effective police systems among the developed countries. Japan's record of arrests (as of 1980) is 97.2 per hundred offences compared to 72.3 in the USA; 79.4 in France; 88.1 in the UK, and 95.6 in West Germany.

The response time (time between receipt of complaint or call and arrival at sight) of Japan's police is about 4 minutes 30 seconds, on an average. Presently, Japan has the lowest crime rate in the developed world. The police are relied upon and respected in Japan. Bangladesh never thought of emulating any police system as she inherited a British police system which had already earned a bad name in Bangladesh. People hardly consider their police to be of any help. The police are avoided by the people even in serious cases. Due to the lack of effectiveness of the police, the social condition for economic activities has an in-built negative factor.

The administrative system, working with a network of colonial and outdated rules, has so many loopholes that corruption, abuse of power, extortion and bribery are rampant in Bangladesh. The corruption is so deep-rooted that despite open reactions by many government leaders nothing concrete could be done to abate it. This corruption rapidly erodes the popularity of a government and a change takes place. It is this corruption that brought about political instability in Bangladesh, though through different events.

In Bangladesh, politics has hardly attracted the people of top calibre, who preferred science, engineering, or a medical education. The majority of the top level arts students preferred to join the civil service. Some students joined the armed services. Enterprising and independent minded people started their own businesses. Thus mediocre politicians who went to power could hardly give a constructive leadership to overhaul the entire anti-developmental system. As time passed, the problems multiplied. So despite initial efforts to do something, almost all the past leaderships gave up halfway in favour of easy-going *laissez faire* policies. This type of situation is not confined to Bangladesh alone. Probably most the developing countries which are not progressing have similar problems. The develop-

ing countries which achieved some progress had a leadership strong and educated enough to guide their nations with all the wisdom available within their countries.

The people in government in Bangladesh tend to consider their superficial perception of the problems as real wisdom. They hardly feel the necessity of learning by creating an atmosphere for access to the wisdom available from people outside the government. Although Japanese politicians and the bureaucracy are highly educated and studious, they rely on the wide spectrum of public wisdom to fix national policies. There are (as of 1975) 246 government-private deliberation councils that guide national policies to serve national interests unaffected by any political interest of any groups or individuals.

Although Japan borrowed almost all its basic institutions from other countries, she did not adopt any foreign labour policies despite constant foreign pressure. The industrial club (of industrialists) reacted to foreign pressure at the Paris Peace Conference by sending a cable to Japan's representative as:

> In the present situation of the working class of our country, there are differences in national customs, in the habits of the people, and in social circumstances; the situation of the workers is not the same as that in Western countries. Consequently it is difficult to import and adopt directly the institutions and laws of foreign countries. Moreover, we believe that it would not necessarily be in the best interests of the nation to aim at making labor conditions uniform to those in other countries.[7]

Japan has considered foreign approaches to industrial problems as undesirable and unnecessary. The contribution of the generally loyal hard working, educated, and considerate labour force of Japan could not probably help Japan's growth had she adopted Western labour policies. There were people who had never taken and enjoyed a leave of absence in their entire careers. Even after turning into an economic giant, the Japanese government maintained a 6-day work week until very recently. Full employment has been the key to industrial policy of the government. In sharp contrast, Bangladesh sometimes tried a 5-day work week despite her poor economy. Government seems to have not considered full employment as its policy.

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[7] Byron K. Marshall, *Capitalism and Nationalism in Prewar Japan*, Stanford University Press, Stanford, 1967, p. 86.

The 1980-85 second 5-year plan of Bangladesh estimated population increase at 10.54 million and new job openings for 5.18 million persons, if the government allowed a current account deficit of US$9,162 million (which is a big amount compared to annual export of about US$800 million). This means the plan shall virtually generate an additional unemployment for 5.36 million persons while sinking the nation deeper into foreign debts.

From the comparisons and discussions made so far, it may be said that Bangladesh by following policies very different loom Japan's has not made any economic progress, rather it is going economically backwards quite fast. On the contrary, countries like South Korea, Taiwan, Singapore, Malaysia, and Indonesia are doing very well. Even if the success of Indonesia may be somewhat attributed to its oil-money, the economic success of these countries is largely due to their economic policies keyed to industrialization by emulating Japan's earlier policies with high efficiency.

Many people might argue that Japan is growing fast because of its light defense budget burden. This is somewhat true about the postwar period, but Japan spent as much as 50% of its budget in some prewar years. Japan gained economically from investment in army and arms industries when she colonized Taiwan, Korea, and Manchuria. In today's international environment, it would not be economically gainful for any country, not to speak of the developing countries, to think of colonizing some other countries. It is this war policy of Japan that discouraged many people from thinking of the possibility of emulation of Japan's policy. Japan's policies were rationally planned. As such, strong possibilities of success do exist if Japan's development process is rightly adapted to fit changed circumstances. Lockwood acknowledges and advocates this without much reservation:

> The experience of Japan ... contains lessons for nations of Asia still on the threshold of economic development. These lessons have been too much neglected, in their constructive aspect, perhaps because the well-known militaristic and plutocratic features of prewar Japanese society suggest that Japan's pattern of growth is more to be guarded against than emulated. With all the contrasts between Japan and her neighbors, they can learn more from her in many fields than from any Western nation.[8]

[8] Lockwood. op cit. (comment made in the preface of the book cited).

Keeping in mind that there is no cure-all for economic development and each country has its own background, history, religion, and tradition, Okita comments cautiously on the question of learning from Japan:

> ... that Japan is neither an ideal model case nor an utterly useless case for developing countries; the truth is perhaps somewhere in between.[9]

Okita's remarks that "modernization is not synonym for Westernization", cautioning those who think that development means Westernization, are valuable only for developing countries like Bangladesh, Sri Lanka, and many others trying to Westernize their societies in the name of development. In this pursuit, Bangladesh has created a standard of life for a small section of people high enough to eat up virtually all foreign exchange earned or borrowed. Japan's lesson is at least valuable for the developing countries still at early stages of development in understanding the mechanism of adapting Western, or Japan's industrialization process to its own tradition, without sacrificing their own values.

If an aerial view of a rural area or a suburb of big cities of Japan is taken, the Japanese will appear to live in huts. Most low-cost apartments with small rooms do not have any bath rooms to this day. They go to take baths in *Sento* (Japanese common bath) with payment. It is not yet a social problem because it has been their tradition. Changes are taking place as the economy is growing, but if Japan had given priority to total Westernization of welfare earlier, she probably could not have achieved economic development. As late as the 1950's, Japan did not give priority to welfare over economy. Vogel puts this as follows:

> In the 1950's the Japanese government gave top priority to economic growth, to the neglect of wages, consumer goods, housing, welfare packages, and pollution control.[10]

In other words, Japan utilized its backwardness for economic development with its own resources and deferred consumption. Bangladesh and many other developing countries fail to utilize their backwardness for starting development with their own internal resources. The result of this inability is a chronic trade deficit. The

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[9] Okita, op. cit., p. 94.

[10] Ezra F. Vogel, *Japan as Number One* (Tokyo: Charles E. Tuttle, 1979), p. 81.

trade deficit of Bangladesh with Japan alone is alarmingly high. For instance, Bangladesh exports to Japan were US$14.237 million while imports from Japan were US$95.713 million in the 1976-77 financial year. The value of exports from Bangladesh was US$27.901 million and import from Japan was US$348.136 million in the 1980-81 fiscal year. The trade deficit of Bangladesh with South Korea is also increasing.

Japan developed because of its own policies and strategies; Bangladesh is suffering because of its own policies and strategies. We cannot conclude easily that Japan's development process is adaptable to Bangladesh as it is. Bangladesh has some advantages over Japan in that the tropical-hot climate of Bangladesh can save energy cost for living (if the use of air-conditioning is delayed for some time). Except for occasional flooding during the monsoons, room for an increase in agricultural productivity with a minimum of inputs and irrigation exist. Bangladesh can skip many steps of development as a late-comer, as Japan skipped many steps the West had to pass through. Japan used pedal-operated rotary threshers in 1910 to save peak labour.[11] Bangladesh may now use more efficient agricultural equipment to increase labour and land productivity. Given priority to agricultural mechanization with domestically produced agricultural machinery, Bangladesh can at anytime increase agricultural produces. But if action is delayed and meanwhile industrialization in other sectors moves at a faster pace, there would be labour shortages increasing labour cost, which might make the total industrialization process a failure.

There is no reason why Bangladesh cannot generate sufficient domestic capital for development, as Japan did, if she chooses self-reliant policies with the resultant hardship for some time. But this is probably the most difficult task for any ordinary government to make the people accept some calculated hardships. Japan was blessed with a dedicated leadership and bureaucracy to correct its course at any cost when the situation demanded. This is reflected from the deflationary reform of Matsukata in the 1880's when government expenses were brought under control by cutting government jobs, stretching working hours and pay cuts along with import curtailment. The bold step of 10% pay cut for military and civil of-

[11] Angus Maddison, *Economic Growth in Japan and the USSR*, George Allen & Unwin, London, 1969, p. 21.

ficials in 1929 by Prime Minister Hamaguchi Osachi was an important evidence of Japanese leaders' concern and ability of self-correction. Takahashi's introduction of his famous deficit financing in 1932 to overcome economic depression and later his own attempt to curtail military expenditure are examples of the brilliant and innovative measures Japanese leaders had been taking from the early Meiji period onwards.

The postwar Dodge plan compelled Japan to take another tough rationalization plan that called for a drastic cut in government jobs (about 10,000 jobs were cut from MITI alone). One might question whether such a drastic measure is possible today. Japan's plan of cutting about 82,000 government jobs over five years in 1980 and turning the government railway and other corporations into private companies, and balancing the budget without increasing taxes may be considered to be impractical in any developing countries and on some developed countries. Chalmers Johnson points out that no single individual at a particular time was responsible for Japan's development. Japan always got proper leadership to work with collective wisdom. Japan's achievements were the result of a tortuous learning and adaptation process.[12]

A developing country like Bangladesh can profitably adapt Japan's development process only if she has proper leadership to make the people accept initial hardship and work with collective wisdom as Japanese leaders did and are still doing. The technological gap between the developed and the developing world is now bigger than it was in Japan in the nineteenth century. Developing countries have, therefore, greater technological backwardness but bigger growth opportunities. Bangladesh and similar other developing countries can exploit the opportunities with the available backlog of know-how and technology by skipping many stages and by avoiding many problems Japan faced during the course of her industrialization. Most of the developing countries have at least some people already qualified to handle the rigour and take the burden of selected modernization suited to their individual conditions. In this respect, the developing countries are in a better position than Japan was in the early Meiji period. Japan did not have control on her tariff till 1911, according to the treaty she had to enter into after ending her isolation in 1854. She had to protect herself through

[12] Johnson, op. cit., p. 306.

nontariff barriers and other nationalistic measures. The developing countries do not have any such disadvantage. Some developing countries tend to accuse the World Bank, IMF, Asian Development Bank, and various other international financing institutions of interfering with their domestic policies. But the developing countries could have avoided such interference had they followed self-reliant economic policies as Japan had done.

ELEMENTS OF THREAT TO GLOBAL ECONOMIC ORDER

Japan's earlier development strategy is broadly adaptable to the developing countries under certain conditions, but the world situation has changed in recent years. The old developed countries of America and Europe, which until recently had advocated free trade and market economy, are now becoming protectionist under different pretexts.

Japan's ever expanding trade surplus is not only being criticized outwardly but also being viewed as unacceptable by the USA and the EC. The USA, the leading international donor to the developing countries, to maintain its political influence is not economically capable enough to sustain its lead any more. The service sector including financial service was always dominated by the West. Now, Japan holding an annual trade surplus of more than US$100 billion for the last few years (US$136,051 million in 1992 and US$113,683 million in 1991) and with a cumulative trade surplus of more than US$700 billion as of 1993 has been aggressively investing in the acquisition of foreign banks, financial institutions, information media enterprises, real estates and, of course, manufacturing industries in the USA, the EC countries, Australia, and elsewhere throughout the world. Foreign investment and domestic production in those countries were encouraged from the viewpoint of lowering their trade deficits. But Japan's too fast and too massive foreign outward investment was raising eyebrows.

Japan's loan to the developing countries is also going to exceed that of the USA. The planned US$70 billion loan by Japan over the next 5 years starting from 1993 in the name of Official Development Assistance (ODA) will also give Japan business opportunities in the recipient countries much to the envy of the traditional Western loan givers. The collapse of the Soviet Union is going to open up a new

market for Japan. Japan is therefore going slow putting pressure on Russia for the return of the four disputed Kuril Islands she claims. The USA which wants to take a lead in exploiting the market is finding itself in a difficult situation to loan a sizeable amount, because of her own economic problems. The EC countries are however going ahead to enter the newly opened market.

Japan is trying to increase her share in the IMF, the World Bank, and the ADB to ultimately have a bigger say and finally bigger economic gains by evolving means to secure her overseas investments and loans. This is obviously in Japan's own economic interest. The USA and Europe have a long tradition of aiding the needy countries under reasonable terms or without conditions, but Japan with her short history of affluence and no tradition of genuine assistance without direct or indirect strings might still think of gaining much more than what she gives.

Japanese *Sogo shosha* (General traders) groups traditionally manage to get most of the tenders and contracts financed or cofinanced with Japanese funds. Cases of their bribing high officials of the recipient governments are well known all over the world. The increased Japanese ODA may thus lead to worse corruption in the developing countries. Of course, Japan is not the only country involved in corruption. Western companies are also involved in such cases, but it is a matter of degree and the corruption level of the recipient country. The fact however remains that the people of the recipient countries ultimately have to bear the burden of the loans inflated by corruption.

Heavy loans taken by past governments of many countries have accumulated to a colossal sum and the debt servicing has eaten up most of their foreign exchange earnings and, in many cases, they are borrowing further to service their debts. In the last couple of years many developed countries, including Germany and the USA, have realized the need to write off most of the loans, but Japan is basically unwilling to do that although she is offering debt relief grants to some poorly developing countries. The debt relief grant itself is involving non-transparent policies and corruption as revealed in a number of cases, such as the case of the purchase arrangement of flood rescue boats by Bangladesh under such a grant at twice the cost of the lowest bidder through an almost mock tender or the so-called Japanese practice of championship.

This sort of practice is distorting the market economy or free trade. The USA, the biggest economy of the world, has since the early 1980 lost a balance between its consumption and production, thus both the budget deficit and international trade deficit that continued for last decade made her the single biggest debtor country in the world. But her ego as the single superpower is not allowing her to take steps for redevelopment of her economy with an emphasis on manufacturing again. Instead, she enacted a number of protectionist laws to punish the so-called protectionist countries for not opening their markets for US goods and services. When this also did not work to reduce her deficit and unemployment, she had been adopting the policy of high-handedness since president Reagan's time in international affairs to distract the attention of the Americans from domestic economic issues. The raiding of Libya and invasion of Panama may be more of an expression of such a psychological state of mind of the leaders rather than any sound cause, or their personal dislike of the leaders of those countries. The war with Iraq before all peaceful means of a peaceful settlement were exhausted is also a case that demonstrates the state of mind of the leaders and their faith in the use of the killing power and the virtual abuse of the UN office in total disregard to the international voice of conscience. The USA however made some economic gains out of the war subscription she collected from many rich countries, including Japan, which paid US$9 billion. Kuwait's oil field restoration also gave the USA direct financial benefits. The USA terrorized the small countries of the world, particularly the Arab countries, and managed to secure orders for US$ 20-30 billion worth of arms sales immediately. One might wonder why the world has sunk into a recession now when the so-called gulf war ended in early 1991 and the oil prices were not raised substantially. Why did the bubble economy (of late 1980's) of Japan get squeezed though Japanese trade surplus has been increasing despite the high value of yen since the Plaza accord of 1985?

The idea of forcing the value of the Japanese yen upwards against the dollar to reduce US trade deficits with Japan worked negatively for the USA. The US manufacturers which could benefit from a high yen were already out of business. The American property and the American high-tech companies became cheaper for Japanese investors, and they took advantage of the situation. The USA and the other countries dependent on many Japanese supplies had to pay more in terms of dollars and Japan's trade surplus

swelled further. Now the USA is getting more and more intolerant and envious of any other country's economic success. The forced closure of the Bank of Credit and Commerce International, an Arab financed bank that was expanding rapidly, may be more due to less US permissiveness and tolerance than for any outward cause shown, as the USA has enough laws to handle any improper activities by any bank.

As financial speculation is a big factor in creating a bubble economy, the uncertainty in the economic future is an equally negative factor. Before the gulf war, there existed some sort of international balance of power—real or psychological, visible or veiled. Although some sort of respect for international law already existed, but along with the end of the gulf war and immediate collapse of the Soviet Union, when it became clear that the USA is the only superpower with overwhelming killing power and a strong tendency to use it to punish the real or imaginary enemies, the real respect for and hope of protection of international law evaporated from the minds of the smaller countries. Many countries started to think safer for them to side with the USA even when it was clearly wrong. The USA may consider this as its policy success, but the erosion of respect for the USA which genuinely helped many countries much more than any other country can think of this as a great loss. Application of force may look brave but earning real respect with inner greatness of a country like USA would be great. Had it earned the real respect of the world, many internal or regional problems, such as the Arab-Israel conflict, Palestinian issue, the present Yugoslav problem, Bosnian problem, Somalian problem, and the like could have been solved long before they became real problems. One may say, the problems are in the interest of the arms building countries of the West, but that is not permanently in their interest. The cost of mistrust is too high and the possibility of peace which is essential for orderly economic growth becomes too remote.

Efforts for real peace for any party in conflicts may look like a sign of weakness, but any genuine efforts by the USA for lasting and just peace, at least for the time being, shall not be taken as her weakness. She can regain her world confidence as a great nation and not as the powerful bullying nation.

The unwarranted predawn missile attack on Iraq's capital of Baghdad on 27 June 1993 with the pretext of reprisal against an alleged plot to kill former US president Bush during his last visit to

Kuwait is a demonstration of US behavior as the only superpower taking international law at her own hand.[13] The so-called allies and smaller or big countries with older civilizations do not openly criticize the USA only because they are interested in the US market. The USA is probably misunderstanding this silence as moral support. This sort of disregard for international law and norms shall have the intrinsic danger of creating further instability and irregularity in the global economic order. The world shall have to choose between peaceful prosperity with tolerance and display of power in disregard to international law as well as conscience, tradition and civilization of others.

If the nations of the world recover their faith in international law and justice and fairness, people will automatically concentrate on development to improve the standard of living which will, in turn, expand global economy and increase the prospects of world peace more and more.

Japan's huge trade surplus could be recycled for such a great cause, if such a situation prevails, or is worked for by Japan, the USA, and other powerful and resourceful countries. But, if Japan tries to recycle her huge surplus fund and exploit her potential capacity, the world power might get too envious and behave in an unpredictable manner which Japan may find difficult to manage herself. Under this condition the developing countries, which could otherwise enjoy some permissiveness in the market of the developed countries, particularly USA and the EC to gain minimal necessary scope of development, would not only be deprived of the scope which Japan enjoyed during her development stage but may also be discriminated against under some pretext by Japan itself for appeasing those big powers which are likely to go against her own protectionism.

Now there are cries for environmental protection, nonproliferation of arms, human rights, fight against terrorism, market opening, protection of intellectual property, and so on. Many developing countries simply are not concerned with most of them, but there is a chance of their being victimized under any pretext if they happen to differ with any powerful country. This may be done in the name of the UN or some other organizations. Japan is now

[13] The US military, reportedly, fired 23 Tomahawk missiles at Iraq's intelligence headquarters in Baghdad from American ships in the Gulf and Red Sea, killing a number of innocent civilians early Sunday, June 27, 1993.

showing reservations about funding a dam project in India in the name of environment and ecology, though she herself generates hydro-electricity amounting to 10.7% of her total power generation (as of 1990). Japanese government in mid-June 1993 implemented new restrictions on export of biochemical-related equipment and bacteria used in the manufacture of biological weapons, as laid down in a meeting of 25 countries in Paris in December 1992. The restrictions will also apply to seven types of equipment, including freezers and centrifugal separators, and 63 types of bacteria including cholera and Japanese B encephalitis.[14] There is already a big list of restrictions on export, originally made to prevent flow of technology to the communist countries. The developing countries which want to advance in high-tech products may find it difficult even to procure sophisticated equipment at reasonable costs if the present trend of restriction on technology transfer get more stringent under conveniently defined pretexts.

If the technological gap between the developed and the developing countries widens, expansion of the global economy will be bound to slow down and the consequent imbalance lead to explosive tension between nations. In the name of implementing trade embargoes, the USA is intercepting shipments on suspicion in recent years. This is criticized as international state piracy, but if this practice continues and is also adopted or supported by Japan under US pressure, the East Asian situation might explode quickly and the prospects of continued economic growth might be dangerously disturbed.

The Japanese development strategy is being viewed by the West as a threat to their economic future. They are therefore inclined to take preemptive measures so that no other country, particularly the developing countries, can attain the success Japan had achieved by emulating and/or adapting Japanese strategy. That Japanese success that has been a cause of alarm to the West is making it difficult for the developing countries to adapt the Japanese strategy. The global order is thus going to be in a disarray unless Japan itself adjusts her policy to remove the fear in the West of its economic strategy and show permissiveness to the products and services from developing countries so that they can earn enough foreign exchange to import industrial equipment from the developed countries to raise their in-

[14] *The Nikkei Weekly*, June 21, 1993, p.2.

dustrial and social level to create an atmosphere of smooth flow of economic activities globally.

If Japan itself resists the efforts of the developing countries from adopting her earlier strategy and tries only to appease the Western developed countries by attending to individual problems, the global economic order will be in a disarray for a longer period, which something that should be avoided by the West and Japan. The indirect pressure against Japan to strengthen her yen further, as in June 1993, may finally harm the USA and other developing countries more than Japan, even though individual categories of Japanese companies would be affected seriously for some time.

Unlike the past, the volume of money in the market now is much more than any government can control. So government intervention in the money market can no longer sufficiently influence currency fluctuations. It is probably time to think of adopting a fixed currency exchange rate system again, or to fix a fluctuation zone, or periodical review system within a framework to bring about stability in trade and global economy unaffected by speculative arbitrary currency fluctuation. Of course, other measures being taken by the industrialized countries to create mutual trust with developing countries and the newly industrialized countries instead of resorting to bullying, coercion through abuse of the UN office, the World Bank, IMF, or other international forum created for it seem for pious purposes and encouraging distrust among countries or group of countries for immediate benefits in the name of national security strategy.

Chapter 8

CONCLUSION

Unlike Japan in the early Meiji period, many developing countries, such as Bangladesh, have already developed enough of an infrastructure to start modernization of education, industrialization, overhauling of legal system, streamlining of institutions, and improvement of agriculture. Through pragmatic and educated policies, the burden of defense expenditure may be lightened. International relief, grants or loans for often spectacular and unrealistic projects given to the developing countries are creating economic and social problems for them. Except for very extraordinary circumstances, most developing countries could avoid the curse of these loans or grants had it not been for their attitudes towards being dependent. When Japan took a small loan of US$40.20 million for electric power companies in 1953 and, later for some steel companies, these small loans were criticized bitterly in the Diet as a national dishonour. Countries poor in natural resources might find this Japanese attitude a good example for their own development mainly with internal resources.

The Japanese practice of using education as a tool for national development and population control may also be universally adaptable. The industrial and trade policies of Japan, now being criticized by the developed countries, could be adopted by the developing countries with very little modification. Japan is being criticized now because she is considered to be virtually following a protectionist policy, even after developing into the second largest economy in the world by enjoying the permissiveness of the USA, Canada, Australia and the EC, and by exploiting free trade practised by other developed countries.

The banking system, fiscal and monetary system, legal system and taxation system of Japan may be valuable models for many

developing countries. It is doubtful whether any other systems can pull a poor developing country out of poverty.

Japanese institutions are designed to serve the interest of the nation effectively, and they have been innovative in finding solutions to problems that have come up from time to time. Japan's institutions provide invaluable lessons to any developing country that wants to improve herself.

The developed countries sometimes look at the developing countries with sympathy and offer them grants or loans for things they consider useful to their own countries. But usually, it so happens that what is considered to be a necessity in developed countries may be a mere wastage or something totally useless in the developing countries because of differences in tradition, climate, religion, and habits. Many informed citizens of the developing countries feel sorry for the people of some developed countries like Japan because of their fast and busy life. The philosophy of life is different in various countries. The people of Japan have money, but no time to enjoy it. The people of the developing countries have time, but no money. Most of the developing countries could achieve a better standard of living much higher than that of the Japanese, if they put some of the free time into selected work. The countries that cradled human civilization are now poor developing countries because of their resorting to easy life for too long.

Finally, most of the Japanese policies, strategies, and the total development process itself are not only adaptable to the developing countries but also essential for fast and selective development, keeping their own values and good tradition, though adaptation should be careful depending on whether a developing country is poor in resources, have a high density of population, or rich in natural resources. The countries that want to benefit from such an adaptation must have a motivated and learned leadership to overcome basic difficulties before launching the development process. No piecemeal work at a slow pace or wrong sequence is likely to give any results even close to what Japan has achieved. The developing countries may not be able to enjoy the international permissiveness, that Japan did, for their exports even if their products are competitive in price and quality.

The developing countries could expect a market in the developed countries and prosper along with the development in the developed countries. Japan is not giving this opportunity to the developing

countries and is progressing at the cost of both the developing and other developed countries as can be seen from the volume of the enormous trade surplus she has with almost all non-oil exporting countries. The developed countries are now alarmed by Japan's economic penetration into their countries. Japan has pushed many of their local industries out of business one after another. Although the developed countries have been traditionally moving from labour intensive to capital intensive and technology intensive industries in order to make room for developing countries, with their labour intensive and lower technology based industrial products in their own market, Japan has not followed the trend of the Western industrialized countries and has protected all sectors of her industries with necessary automation in previously labour intensive areas. A wave of protectionism in the developed countries has been generated by Japan, which may sweep away the traditions of free trade that benefitted Japan.

Even though Japan's earlier policies and development process are adaptable to the developing countries, Japan's present policies will probably deprive them of the international market Japan enjoyed. The developing countries shall have to take into consideration the adverse effects of Japan's present policies while adopting her earlier policies of modernization and development. It is yet to be seen in the coming years whether the industrialized nations try to resort to protectionist policies to appease pressure groups within their own countries, or exercise wisdom and sacrifice some of their own pride, and evolve a fair mechanism of trade and global economic order to the benefit of all the countries of the world.

APPENDICES

Statistical Tables

Appendix 1. Public and private educational institutes, enrolment and number of teachers in Japan, May 1991.

	Institutions (no.)				Teachers	Students
	Total	National	Public	Private	('000)	('000)
Elementary schools (6 years)[a]	24,798	73	24,557	168	453	9,157
Junior high schools (3 years)[a]	11,290	78	10,595	617	308	5,188
Senior high schools	5,503	17	4,170	1,316	349	5,455
Universities	515	97	39	378	221	2,206
Junior colleges	592	41	54	497	57	504
Technical colleges	63	54	5	4	6	54
Special schools[b]	960	45	898	17	49	92
Training schools	3,370	163	185	3,022	127	835
Miscellaneous	3,309	4	84	3,221	44	407
Kindergartens	15,041	48	6,224	8,769	110	1,978
TOTAL	65,440	620	46,811	18,009	1,724	25,876

Note: [a]Compulsory education is nine years of elementary school and junior high schools. [b]For the physically and mentally handicapped. Vocational schools: 3,408 ('93).

Source: Ministry of Education, Japan, *Statistical Abstract of Education, Science & Culture*, 1992, as referred to in the secondary source, Keizai Koho Center, *Japan 1993*, p.94.

Appendix 2. Medical service in Japan in comparison with selected countries.

Country	Year	No. of physicians		No. of establishments and beds		
		Total	Per 1000 persons	Establish-ments	Total beds (no.)	Popula-tion/bed
Japan	1990	211,797	1.71	10,096	1,676,803	74
Canada	1984	48,860	1.96	1,226[a]	182,791[a]	129[a]
USA	1984	501,200	2.14	7,051[b]	1,333,360[b]	171[b]
France	1886	173,116	3.19	961[c]	318,459[c]	170[c]
Germany	1984	153,895	2.56	3,189[c]	695,603[c]	89[c]
Italy	1986	245,116	4.24	1,832[d]	554,595[d]	103[d]
UK	1981	92,172	1.64	1,937[e]	351,505[e]	-
Australia	1986	36,610	2.29	-	-	-
USSR	1985	1,170,000[f]	4.21	23,100[b]	3,324,200[b]	80[b]
Sweden	1985	21,596	2.64	[g]699	[g]21,099	[g]69
Switzerland	1985	9,298	1.46	[g]409	[g]67,066	[g]96

Note: [a]1978. [b]1980. [c]1982. [d]1979. [e]England only. [f]Including Dentists. [g]1981.

Source: *Statistical Yearbook*. 1983-1987. U.N. and Ministry of Health and Welfare, Japan as cited in Keizai Koho Center, *Japan 1993*, p.89.

Appendix 3. Japan's local government revenues and outlays, 1992.

Revenues (¥ billion)		Outlays (¥ billion)	
Locally raised taxes	34,024.00	Salaries & Pensions	20,946.50
Non-categorical grants from central govt	15,679.20	For compulsory education	6,358.60
Categorical grants from central govt	11,993.00	For police	2,171.10
Local govt. bonds	5,140.00	General administration	14,963.30
		Public loans	6,069.80
		Maintenance & repair	817.90
		Public works and others	24,465.50
TOTAL REVENUE	74,365.10	Total outlay	74,365.10

Source: Ministry of Finance, Japan; Keizai Koho Center, *Japan 1993*, p.79.

Appendix 4. Park area in selected cities.

Country	City	Year	City area (ha)	Population !000 (A)	Park area ha (B)	Per capita B/A (m^2)
Japan	Tokyo[a]	1989	58,390	8,157	2,045	2.5
USA	Chicago	1984	59,133	3,063	7,308	23.9
	New York	1976	-	7,780	15,000	19.2
	Los Angels	1984	119,040	2,761	5,945	21.5
UK	London	1976	157,950	7,174	21,828	30.4
Germany	Bonn	1984	14,100	289	1,082	37.4
France	Paris	1984	15,539	2,317	2,821	12.2
Canada	Montreal	1984	17,500	1,081	1,413	13.1
Korea (Rep)	Seoul	1984	43,336	3,395	1,595	4.7
New Zealand	Wellington	1984	10,837	135	523	38.8
Poland	Warsaw	1984	44,590	1,639	4,151	25.3

Note: [a]23 wards of Tokyo. Source: Ministry of Construction. Japan; Keizai Koho Center. *Japan 1993*, p.88.

Appendix 5. Annual wage increase and weekly working hours in manufacturing industries[a].

	Japan		USA	UK	Germany (FR)	France
Year	Wage increase[b] (%)	working hours	working hours	working hours	working hours	working hours
1970	16.9[c]	45.6	37.9	41.5	40.3	43.1
1974	32.9					
1975	13.1	41.2	38.2	39.8	36.2	40.1
1977	8.8					
1978	5.8	43.1	39.1	40.5	37.3	39.4
1980	6.7					
1983	4.40					
1987	3.56					
1992	4.95					

Note: [a]Based on ILO bulletin. [b]Based on Shunto (Spring offensive for wage rise). [c]1971.

Source: Keizai Koho Center, *Japan 1980-93*.

Appendix 6. Days lost in labour disputes in some selected years.

Unit: 1000 man-days

Year	Japan	Germany (FR)	France	UK	Italy	USA
1972	5.147	66	3.755	23.909	-	27.066
1973	4.604	563	3.915	7.197	-	27.948
1974	9.663	1.051	3.380	14.750	-	47.991
1975	8.016	69	3.869	6.012	-	31.237
1976	3.224	534	5.011	3.284	25,378	37.859
1977	1.498	24	3.666	10.142	16.566	21.258
1978	1.353	4.281	2.200	9.405	10.177	23.774
1979	919	483	3.172	29.474	27.530	20.409
1980	998	128	1.511	11.964	16.457	20.844
1981	543	58	1.442	4.266	10.527	16.908
1982	535	15	2.257	5.315	18.563	9.061
1983	504	41	1.321	3.754	14.003	17.461
1984	354	5.618	1.318	27.135	8.703	8.499
1985	257	35	727	6.402	3.831	7.079
1986	252	28	568	1.920	5.644	12.140
1987	256	33	501	3.546	4.606	4.469
1988	163	42	1.132	3.702	3.315	4.364
1989	176	100	805	4.128	4.436	16.996
1990	140	364	-	1.093	5.181	5.926

Source: Keizai Koho Centre, *Japan 1980*-1993

Appendix 7. Unemployment: number and rate in selected years.

Unit: 1000 and (%)

Year	Japan	Germany	USA	UK	France
1970	590	149	4.088	612	262
	(1.1)	(0.7)	(4.9)	(2.6)	
1975	1,000	1.074	7.830	978	840
	(1.9)	(4.7)	(8.5)	(4.1)	-
1980	1,140	889	7.637	1.795	1,451
	(2.0)	(3.4)	(7.1)	(6.9)	(6.4)
1986	1,670	2.228	8.237	3,289	2.517
	(2.8)	(9.0%)	(7.0%)	(11.8%)	(10.4%)
1987	1,730	2.229	7,425	2,953	2.836
	(2.8)	(8.9)	(6.2)	(10.6)	(10.5)
1988	1,550	2,242	6,700	2,370	2.564
	(2,5)	(8.7)	(5.5)	(8.5)	(10.0)
1989	1,420	2,038	6,520	1,799	2,532
	(2.3)	(7.9)	(5.3)	(6.3)	(9.4)
1990	1,340	1.883	6,873	1.665	2,503
	(2.1)	(7.2)	(5.5)	(5.9)	(8.9)
1991	1,370	1,689	8,426	2,289	2,710
	(2.1)	(6.3)	(6.7)	(8.1)	(9.4)
1992	1,360	1.719	9.242	2,652	2.854
March	(2.1)	(6.3)	(7.3)	(9.4)	(9.9)

Source: The Japan Times, *100 Questions and Answers JAPAN'S ECONOMY AND JAPAN-US TRADE* 1982, p.60.

Appendix 8. Structure of employment in Japan and selected countries.

Country	Year	Total employed (million)	Composition (%)		
			Primary	Secondary	Tertiary
Japan	1882	-	82.3	5.6	12.1
	1930	29.619	49.4	20.4	30.0
	1950	35.626	48.3	21.9	29.8
	1960	43.716	30.2	28.0	41.8
	1970	52.042	17.4	35.1	47.5
	1980	55.360	10.4	34.8	54.8
	1991	63.690	6.7	33.9	59.4
Germany	1989	27.742	3.7	39.1	57.2
UK	1990	26.881	2.1	27.6	70.3
France	1990	22.031	6.0	28.6	65.4
Italy	1990	21.454	8.8	31.9	59.3
USA	1990	117.914	2.9	25.1	72.0

Note: Definition of sectors varies according to country.

Sources: Bank of Japan, *Comparative International Statistics*, 1970, 1975, 1992 as cited in Keizai Koho Centre, *Japan 1993*, p.20.; Okita, op. cit., p.174.

Appendix 9. National and local government employees in Japan, financial year, 1992.

National Government (A)		Local Self-Government (B)	
Sector	Employees ('000)	Sector	Employees ('000)
Fixed by general account	566	Prefectures	1.744
self-defense personnel	275	Educational personnel	1.049
Fixed by special account	602	Police	252
postal service	305	Cities, towns, and villages	1.498
Sub-total (A)	1.168	Sub-total (B)	3.242
TOTAL government employees (A+B) : 4.410			

Source: Ministry of Home Affairs, Japan as cited in Keizai Koho Center, *Japan 1993*, p.96.

Appendix 10. Labour unions and unionization rates in Japan and some selected countries in selected years[a].

Country/Union	Year	No. of Unions	No. of Members (A) ('000)	No. of Employees (B) ('000)	Unionization rate (%) (A/B)
Japan	1970	30,058	11,605	32,770	35.4
	1980	34,232	12,369	40,120	30.8
	1985	34,539	12,418	43,010	28.9
	1991	33,008	12,396	50,620	24.5
Shin Rengo (Japanese Trade Union Confederation)[de]	1991	13,262	7,615		
Zenroren		2,198	840		
Zenrokyo		218	299		
Other (including non-fed)		17,590	3,872		
Germany	1989		9,463		28.3
UK[b]	1989		10,158		44.4
USA[c]	1990		15,740		16.1

[a]Unions are labour unions, and not unit unions. [b]The UK figures include the union members of branch offices outside UK. [c]The USA unionization rate is the ratio of union members to the number of non-agricultural laborers. [d]The members of Unions belonging to more than one national federation are double-counted and thus the total number may not match with overall today. [e]Rengo was established in November 1987 and incorporated as Sohyo in November 1989 and became Shin Rengo.

Source: Ministry of Labour, Japan. *Labour Statistics Handbook*, 1992 and *Labour Basic Survey*, 1992 as cited in Keizai Koho Center, *Japan 1993*. P. 72.

Appendix 11. Comparison of Japan's national tax revenue structure with some selected countries (financial years).

Tax revenue	Japan ('92)	USA ('90)	Germany ('89)	France ('89)	UK ('90)
Direct taxes (% of total)	**74.1**	**91.7**	**53.3**	**39.1**	**58.7**
Income tax	41.7	74.9	43.0	20.6	35.5
Corporate tax	28.3	15.0	7.4	11.5	13.8
Inheritance tax	3.4	1.8	0.5	1.7	0.9
Others	0.7	-	2.4	5.3	8.5
Indirect & other taxes	**25.9**	**8.3**	**46.7**	**60.9**	**41.3**
Value-added tax	[a]7.6	-	28.5	45.0	22.8
Liquor tax	3.1	0.9	1.3	-	3.1
Customs duties	1.3	2.7	1.5	0.9	1.2
Others	13.9	4.7	15.4	15.0	14.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

[a]Consumption tax (3%).

Source: Ministry of Finance, Japan.

Appendix 12a. Central government outlays in Japan and selected countries, 1991.

	Year	Unit and currency (billion)	Outlays	Outlays to GNP ratio (%)	Ratio of surplus or deficit to outlays (%)	Total govt debt to GNP ratio (%)
Japan	1985	Yen	53,005	16.3	-21.4	50.3
	1990	Yen	69,651	15.0	-10.5	51.2
	1991	Yen	70,347	15.4	-7.6	50.2
USA (FY)	1985	US$	952.5	23.9	-21.7	48.8
	1991	US$	1,323.0	23.4	20.3	67.5
UK	1991	Sterling	178.5	30.9	-0.7	[a]37.3
Italy	1990	Lira	459.616	35.5	-12.1	90.2
France	1990	Franc	1,509	23.3	-6.7	27.0
Germany	1990	DM	380.2	15.7	-12.6	22.4

Table 12b. Distribution Pattern of Japan's General Account Outlay (1992)

Personnel	5.3 %
traveling	0.2
Materials	3.1
Facilities	1.5
Grants & Commissions	23.9
Transfer to Other Accounts	61.7
Other	4.3

Source: Keizai Koho Center. *Japan 1993.*

Appendix 13. Comparison of emission of global environment polluting sulphur oxide (SOx), nitrogen oxide (NOx), and carbon dioxide (CO_2) by Japan and selected countries.

	SOx (1987) (ton)	NOx (1986) (ton)	Per capita CO_2 (ton)
USA	20,400,000	19,300,000	6.14
UK	-	2,475,000	2.97
Canada	3,800,000	1,959,000	5.27
Italy	2,010,000	1,570,000	2.01
Germany (F.R.)	1,933,000	3,008,000	3.45
France	1,288,000	1,584,000	2.04
Japan	835,000	1,176,000	2.45

Source: OECD Environmental data. The OECD energy balance as cited in Keizai Koho Centre. *Japan 1993*, p. 101.

Appendix 14. Exchange rate of Japanese Yen to US dollar on IMF basis.

Year	¥ = US$	Year	¥ to US$	Year	¥ to US$
1949-71	360.00	1979	219.14	1987	144.64
1972	303.20	1980	226.74	1988	128.15
1973	271.22	1981	220.54	1989	137.96
1974	292.08	1982	249.08	1990	144.79
1975	296.79	1983	237.51	1991	134.71
1976	296.55	1984	237.52	1992	126.65[a]
1977	268.51	1985	238.54	1993[b] (Jun 1)	107.00
1978	210.44	1986	168.52		

Note: The rate of ¥360 to US$ was set on 25 April 1949 and this became Japan's official exchange rate on her entry into IMF in August 1952. This rate continued for about 22 years until it moved to a floating rate system on 28 August 1971. [a]Unofficial average rate. b + June.

Source: Keizai Koho Center. *Japan 1980-1993*.

Appendix 15. Trend of defense expenditures in Japan and in some selected countries in selected years, 1955-'92.

Year	Expenditure		Year to year growth (%)	Ratio to	
	Billion (¥)	Million (US$)		General budget (%)	GNP (%)
1955	135.0	375	-3.3	13.61	1.78
1960	156.9	436	0.6	9.99	1.23
1961	180.3	501	14.9	9.23	1.15
1962	208.5	579	15.6	8.59	1.18
1963	241.2	670	15.7	8.46	1.18
1964	275.1	764	14.1	8.45	1.14
1965	301 4	837	9.6	8.24	1.07
1966	340.7	946	11.8	7.90	1.10
1967	380.9	1,058	11.8	7.69	0.93
1968	422.1	1.173	10.8	7.25	0.88
1969	483.8	1,344	14.6	7.18	0.84
1970	569.5	1,582	17.7	7.16	0.79
1971	670.9	1.864	17.8	7.13	0.80
1972	800.2	2,639	19.3	6.98	0.88
1973	935.5	3,449	16.9	6.55	0.85
1974	1,093.0	3,742	16.8	6.39	0.83
1975	1,327.3	4,472	21.4	6.23	0.84
1976	1,512.4	5,100	13.9	6.22	0.90
1977	1,690 6	6.296	11.8	5.93	0.88
1978	1,901.0	9,033	12.4	5.54	0.90
1979	2,094.5	9,558	10.2	5.43	0.90
1980	2.230.2	9,836	6.5	5.24	0.90
1985	3,137.1	13.151	6.9	5.98	0.99
1987	3,517.4	25.422	5.2	6.50	1.00
1989	3,919.8	28.406	5.9	6.49	1.01
1990	4,159.3	28.730	6.1	6.28	1.00
1991	4,386.0	32.559	5.5	6.23	0.95
1992	4,552.0	[a]36.416	3.8	6.30	0.94

Note: Japanese yen value is converted to US dollar at the average IMF rate. [a]$=¥125.0

Sources: The Japan Times: 100 Questions and Answers Japan's economy and Japan-US trade. 1982, p.16; Keizai Koho Centre, *Japan 1993*. p.84.

Appendix 16. Defense expenditures and armed personnel in some selected countries in selected years[a].

Country	Year	Defense expenditures				Armed forces personnel ('000)
		Amount (US$ million)	Per capita (US$)	Ratio to budget (%)	Ratio to GNP (%)	
USA	1975	88.983	417		5.9	
	1987	288.433	1,185	28.7	6.7[c]	2,158.0
	1990	304.090	1,214		[b]5.8	2,029.6
France	1975	13.984	264		3.9	
	1990	42.780	755		4.5[b]	453.1
Germany	1975	16.142				
(FR)*	1987	34.244	560	22.9	3.1[c]	495.0
	1990	42.775	478		3.1[b]	476.3
UK	1975	11.118	198		4.9	
	1990	39.260	693		4.0[b]	300.0
Japan	1975	4.472	42	6.23	0.84	
	1990	28.730	232	6.28	1.00	246.4
Italy	1987	16.817	293	4.9	2.2[c]	388.3
	1990	24.740	432		[b]2.3	361.4
Saudi Arabia	1987	16.235	2,360	35.8	[c]22.4	73.5
	1990	13.860	1,308		[b]15.8	76.5
Canada	1990	11.380	424		1.1	86.6
South Korea	1990	10.620	240		[b]5.0	750.0
Iran	1975	8.800	268		17.4	
Iraq	1990	8.610	434		21.1[b]	382.5
Israel	1987	5.136	1,154	20.8	18.9[bc]	141.0

[a]These data were originally for a long-term trend and precise comparison is difficult due to difference in calculation methods. [b]Defence expenditure to GDP. [c]1986. *Germany was unified in 1990.

Sources: Okita. op. cit., p.259; Keizai Koho Centre, *Japan 1990*-93.

Appendix 17. Breakdown of Japan's defense spendings in selected years, 1979, 1981, and 1982.

Unit: US$ billion

Items	1979	1981	1982
Personnel and feeding expenses	**51.4%**	**47.7%**	**46.6%**
Material expenses	**48.6**	**52.3**	**53.4**
Equipment procurement	18.7	22.5	22.4
Research and development	1.0	1.0	1.1
Facilities	2.9	2.2	2.3
Maintenance	13.9	14.7	15.8
US military bases	10.2	10.5	10.4
Miscellaneous	1.8	1.5	1.4
TOTAL	**100.0**	**100.0**	**100.0**

Sources: Nihon Keizai Shimbun Inc., *Industrial Review of Japan, 1984*. pp. 84-85, 87.

Appendix 18. Top Japanese defense equipment suppliers.

Mitsubishi heavy industries	Hitachi Zosen Corporation
Kawasaki heavy industries	Howa Machinery Ltd
Mitsubishi Electric	Hitachi Ltd
Ishikawajima - Harima heavy industries	Fujitsu Ltd
Toshiba	Nissan Motor
NEC	Oki Electric Co.
Fuji heavy industries	Nippon Seiko
Japan steel works	Daikin Kogyo
Sumitomo heavy industries	Tokyo Keiki
Komatsu	Shimadzu Seisakusho
Shin meiwa industry Co.	Nippon Koki
Japan Aircraft Mfg. Co.	Nippon Oil
Mitsui Engineering & Shipbuilding Co.	

Source: Nihon Keizai Shimbun, *Industrial Review of Japan*, 1982-1992.

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