Economic Development of Japan:
Factors, Consequences and Implications

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The economic take-off in the mid-1880s was dependent both on the inheritance from the Tokugawa era and on the powerful policies of the Meiji government. In the period thereafter rapid technological progress and animated fixed investment of the private sector may be identified as major factors for the economic growth. Although the rapid technological progress was due basically to the introduction of western technologies, it must be emphasized that adaptation was frequently made to the imported technologies. The animated investment activities were dependent on the high expected rate of return which came from the rapid introduction of new technologies and on the increase in the savings rate.

I. Introduction

The Japanese economy has attracted much attentions of the developing countries which are anxious to derive any lessons from her history, because Japan is the only developed country outside the west. Considering immense differences in economic, social and cultural aspects between Japan in the past and contemporary developing countries, such attempts looks almost difficult. However, I don't think it is meaningless to study the history of the Japanese economy since the Meiji Period until recent years, and to evaluate the consequences, both beneficial and detrimental, of the economic growth. From these studies some lessons, both positive and negative, can be derived to the developing countries.

In Section II we will discuss why Japan succeeded in the start of modern economic growth (so-called 'economic take-off') and evaluate the

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initial conditions of the modern economic growth. In Section III-VI the process of modern economic growth is surveyed and its causes and consequences will be argued. Among many factors for the growth our discussions are focused on technological progress in the industry and capital formation. As far as the consequences of the growth we will refer to the growth of per capita GNP (or GNE) and its distribution among different income classes. In the last part of this paper, Section VII, we will summarize the major findings and point out their implications.

II. Initial Conditions and the Beginning of Modern Economic Growth

The Meiji Restoration signified the birth of a modern nation, but not necessarily the beginning of modern economic growth or the industrialization.¹ Agriculture accounted still for the largest part of the economy (agricultural labor accounted for 72% of total employment in 1872), what industry existed was usually only a by-employment in agricultural communities, and it involved mainly manual labor. The start of modern economic growth can be demarcated at 1886, since this point of time private companies progressed rapidly. The pre-1886 period after the Restoration was a transition period leading up to the beginning of modern economic growth.

The economic take-off of Japan was between twenty and 120 years behind the advanced nations of the west. The UK had been the first, in the second half of the eighteenth century. In the first half of the nineteenth century many western countries including the Netherlands, Belgium, France and the USA entered the modern economic growth era, and in the middle nineteenth century Germany, Sweden and Italy achieved the take-off. Japan was the first country outside the west, and was one of the ‘latest starters’ among present-day advanced industrial nations.

As far as the causes of the successful economic take-off in Japan, we should refer both to traditional elements — the inheritance from pre-modern society and to the modern elements — economic and social changes in the early Meiji Period. People, especially those in the other countries, are inclined to emphasize the role of policies by the Meiji government, but the recent historical studies by the scholars in and out of

Japan have revealed the importance of the inheritance from the Tokugawa Period. In this paper we argue on these two elements taking the extent of education, one of the basic conditions for the economic development, as an illustration.

One of the greatest inheritances of the Meiji economy from the Tokugawa Period was an abundance of excellent workers: they were able to adapt easily to the new social and economic order, and meet the needs of modern industries when they began to expand rapidly. The extent of education is one of the major reasons for the quality of the labor force. In the Tokugawa Period the ordinary people were educated in terakoya, classrooms set up in people’s houses in which reading, writing and the abacus were taught. By 1868 there were between 12,000 and 13,000 terakoya with a total of 837,000 pupils. It is estimated that at this time 43% of male children and 10% of female children had received education in these institutions. According to R.P. Dore the literacy rate in 1868 was considerably higher than in present-day developing countries and probably compared favorably even then with some contemporary European countries. This was an considerable effect of the traditional education system.

Another contribution of this system was to help the progress of the modern compulsory education system which started in 1872. Many existing terakoya were permitted to become ‘acting’ national schools, and the majority of the teachers at national schools had formerly been teachers at terakoya.

The introduction of the universal compulsory (primary school) education in 1872 was surprisingly early: only five years after the Restoration, and fourteen years ‘before’ the start of modern economic growth. In the USA (the state of Massachusetts), the UK and France compulsory education was introduced until ‘after’ the beginning of modern economic growth; in the 1850s, the 1870s, and the 1880s respectively. Germany (Prussia) was an exception: compulsory education was introduced in 1763, about a century before the beginning of modern economic growth.

How about the level of economy at the starting point of economic growth was? Output in the most important part of the economy, agriculture, is believed to have increased steadily in the Tokugawa Period. Industrial activity in agricultural areas increased, and commerce made significant progress especially in towns and cities. These trends not only continued into the early Meiji Period, but they were accelerated due to the ‘opening’ of the country and the reforms which were carried out by the Meiji government. That is, the growth before 1885 was a result of the expansion of traditional industries, not modern ones (i.e. factories
operating on a large scale and using modern production methods, say steam engines). Also in the Tokugawa Period culture had made a great progress: literature, art, music and drama reached levels of excellence that Japan could be proud of. Science and technology made progress as a result of Dutch studies in spite of the policy of closing country. In short at the starting point of modern economic growth Japan had reached a high level of development, both socially and economically, and was thus in a comparatively favorable position for her economic take-off. Certainly she was in a much better position than present-day developing countries.

How then did Japan in the 1880s compare with the leading nations of the west? Mechanization of manufacturing had hardly begun in Japan in the Tokugawa Period, and though it progressed somewhat in the Meiji Period it was on a much small scale than it had been in England. Before modern economic growth industrial development in Japan was much slower than it had been in England, and also in other countries where new industrial technology was developing. In 1870 per capita GNP of Japan was only 25.1% of that of the UK, 36.4% of that of the USA, and 39.5% of that of Germany. Agriculture's share of total labor force was as large as 72% in Japan (1872), compared with 19% of the UK (1871), 51% of the USA (1870) and 36% of Germany (1882). In this sense Japan had less favorable conditions for take-off than the west. To overcome this difficulty the Meiji government took a series of measures in rapid succession to sweep away feudal elements and introduce modern ones. On the other hand such a lag of Japan behind the west, which is referred to as the 'relative backwardness' by A. Gerschenkron, signifies that there were possibilities for Japan to exploit new technologies which had been developed in the west and not yet introduced to Japan. As will be stated below, this favored the industrialization thereafter.

III. Economic Growth in the Prewar Period

A. Outlook

Concerning with the economic growth in the prewar period we like to point out two characteristics: the relatively high rate of growth and the increasing trend in the rate.

The annual growth rate of real GNE (based on seven-year moving averages; the same in the following analysis without a special mention) for 1889-1938 was 3.2%, the growth rate of total population was 1.1%, and

\footnote{Economic Development of Japan (English version), Table 2-6.}
the growth rate of per capita GNE was 2.1%. The economic growth rate and the growth rate of per capita product are high in comparison with the western countries. For instance the economic growth rate for the years 1900-38 was 1.4%, 3.0% and 2.9% in the UK, in the USA and in Germany. This signifies a successful attainment of the late comer to catch-up with the forerunners. This may stand for an applicability of the relative backwardness hypothesis of Gerschenkron. A relative slow rate of population increase in Japan tended to favor the economic growth.

The economic growth rate as well as the rate of per capita product demonstrated a rising trend with up and down movements (long swings) throughout the prewar period (Figure 1). Such a phenomenon, which has

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**Figure 1**

Economic Growth Rate, Population Growth and Growth of Per Capita GNE

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**Notes:** Y stands for real GNE (1934-36 prices for the prewar period, and 1985 prices for the postwar period).
N = total population.
G(Y/N) = G(Y) - G(N).
Figures for Y and N are seven-year moving averages (five-year averages for 1938, 1954 and 1988).

Sources: Economic Development of Japan (revised Japanese version), Figure 3-3.

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3 Economic Development of Japan (revised Japanese version), Table 2-6.
been called the 'trend acceleration' by K. Ohkawa and H. Rosovsky, is not unique to Japan. This can be seen in the UK from the mid-eighteenth century to the end of nineteenth century, Norway from 1880 to 1936, and Italy from 1865 to 1910. In my impression this phenomenon tends to appear in the 'young countries' in which industrialization makes a rapid progress.

The relatively high growth rate and its rising trend in Japan can be accounted for by referring to two major factors: technological progress and capital formation. That is, the relatively high growth rate was due to the rapid technological progress and the high investment rate (rate of fixed capital formation to GNP or GNE), and the rising trend was due to the acceleration of technological progress and the rising investment rate.

Before the analysis of these factors, we must mention about a change in the industrial structure and export expansion. For 1888-1938 primary industry's share of real GDP (at 1934-36 prices) decreased from 41.5% to 15.9%, while non-primary industry's share increased from 58.5% to 84.1%. In the non-primary sector the share of the industry alone (manufacturing, construction, and public utilities) increased from 11.2% to 51.8%.\(^5\) These changes in industrial structure signify a rapid progress of the industrialization. The industrialization was due to several factors such as the relatively high technological progress in the industry, an increasing allocation of capital to this industry, and a relatively high income elasticity of demand for the manufacturing output.

There was a big change in manufacturing structure. This change can be summarized as a shift from the light industry to the heavy industry. In 1877 the light industry (here it is defined as a total of textiles and foods) accounted for 68.6% of real output (at 1934-36 prices) and the heavy industry (a total of metals, machinery and chemicals) did merely 13.6%. In 1938 these shares became 38.1% and 51.4% respectively.\(^6\) Relatively large dependence on the light industry in the early phase of industrialization and its decrease during the process of industrialization demonstrate that the Japanese pattern of industrialization was a traditional one which was seen in the English industrial revolution.

Japanese exports increased rapidly in the prewar period. According to our econometric study, factors for the export expansion were different among sub-periods. For 1885-1913 the exports increased at a high rate of 83%. This could be accounted for by the rapid expansion of world trade

\(^5\) Economic Development of Japan (revised Japanese version), Table 5-4.
\(^6\) Ibid., Table 5-7.
(an index for world income), of which growth rate was 3.2%,\textsuperscript{7} and the export structure of Japan, who emphasized raw silk and related products with high income elasticity. Improvement of export competitiveness did not make a significant contribution. For 1921-37, on the other hand, the increase in export competitiveness was considerable (the ratio of domestic export prices to world prices with 100 for 1934-36 decreased from 155.2 to 93.4), and accounted for about three fourths of the export increase (8.5%).\textsuperscript{8} World trade did not expand significantly. (The years of 1914-20 were omitted in our study because of abnormal conditions of the world market.)

B. Technological Progress

The rapid industrialization of Japan was dependent considerably on technological progress in the industry. For 1908-38 the growth rate of real GDP (at 1934-36 prices) and that of labor productivity were 6.7% and 4.4% respectively in the industry. The so-called ‘residual’ of the growth, an index for technological progress, is estimated at 2.4%.\textsuperscript{9} Technological progress accounted for about a half of the growth rate of labor productivity.

Technological progress in this period was doubtless dependent on the introduction from the west of ‘borrowing technology.’ For instance electric generating and transmitting technologies were introduced from the USA and Germany. The Osaka Electric Light Company (1889) and the Tokyo Electric Light Company (1895) introduced alternating current technologies from these countries respectively. As a result of this diversion the existence of two different electric generation systems in Japan, the sixty-cycle current in the western Japan and the fifty-cycle current in the eastern Japan, appeared and caused a considerable inconveniences and diseconomies.

Here we should point out two things. 1) The Japanese industry made some efforts to find and develope technologies appropriate to the Japanese factor endowments at that time (labor surplus and capital scarcity). There are two types in this adaptation. The first type is an introduction of premodern technologies, which were already obsolete in the west but still much more efficient than the Japanese traditional technologies. A good example was an introduction of the batten apparatus (a simple

\textsuperscript{7} Ibid., Table 7-1.
\textsuperscript{8} Ibid., Figure 7-4.
\textsuperscript{9} Ibid., Table 5-2.
mechanism attached to the hand loom to raise efficiency in weaving) from France by three Japanese students of Nishijin, Kyoto, in 1873. They did not introduce the most modern technology, the power loom, but did the premodern technology in the west, because the power loom was too expensive to buy and difficult to produce and repair under the engineering level of contemporary Japan, while the batten could be produced very easily by local carpenters. The diffusion of this technology contributed to an expansion of weaving production and opened a way for the adoption of the power loom in the 1920s and 1930s.

The second type was a modification of the imported technologies. Tomika Filature (founded in 1870) by the government was equipped with the most modern technology, which had been introduced from France. Because this capital-using technology was too expensive for small-scale Japanese plants it was not widely used. However, in 1875 a small company in Nagano Prefecture, the Nakayama Company, combined this technology with traditional Japanese technology — zakuri (sedentary reeling) — and created a new reeling technology. This made possible to save capital by substituting water wheels for steam engines, wood for iron in machinery and ceramics for metal in cocoon-boiling basins and steam pipes. Without this modification the rapid spread of machine filature technology and the expansion of the silk reeling industry could not have taken place.

2) The successful introduction of foreign technologies was possible with the capability of the people and the society in Japan to absorb new technology. The adaptation of foreign technologies to domestic conditions mentioned above signifies the large extent of Japan’s capability. There are many items of the capability. One of the most important is human resources. The very early start of compulsory education contributed to the supply of excellent workers who could work with modern technologies to the industry. Furthermore Japan succeeded in supplying the large number of engineers by emphasizing engineering rather than science in higher education. Foreign engineers, who made a great role in teaching new technologies at the beginning of industrialization, were gradually replaced by Japanese engineers. The most important Japanese institutions to supply engineers were Kobu University (University of Engineering, established in 1877, became the Department of Engineering of the University of Tokyo in 1886), the Tokyo Artisan School (established in 1881, and became the Tokyo University of Engineering in 1929), and several schools for the study of industry. The engineers studied foreign treatises and actual imported machinery, and then copied what they saw, often adding modifications.
The capability was considered to increase during the period. This was a case, because, for instance, the number of skilled workers and engineers increased due to the educational progress and their level of expertise increased due to an accumulation of experiences. The increasing capability made a contribution to the accelerating technological progress.

C. Capital Formation

Figure 2 demonstrates that the investment rate did increase considerably in the prewar period; it was only 10% at the end of 1880s but reached at such a high rate of 25% at the end of 1930s. Our econometric study on private capital formation in the non-primary sector (government and primary investment were excluded from this study because of their specific characters) has revealed an importance of a variable of expected rate of return to capital. That is, the rapid capital formation was a result of the high rate of return, and the rise in investment rate was due to a rise in the rate of return. We can state that these were related to technological progress: the high level of the return on capital resulted from the rapid technological progress and the increase in the return on capital did from the acceleration of technological progress. This is because they tend to invest willingly when new technologies are available.

**Figure 2**
The Investment Rate

**Notes:** Gross national capital formation divided by GNE.
Both are at 1934-36 prices for the prewar period and at 1985 prices for the postwar period.
They are seven-year moving averages (five-year averages for 1938, 1954 and 1988).
**Sources:** *Economic Development of Japan* (revised Japanese version), Figure 6-2.
However, we like to point out an additional factor for the level and the trend of the rate of return on capital. It was the existence of surplus labor. We are studying this factor in the below.

D. Surplus Labor

This was one of the most important characteristics of the Japanese economy since the Meiji Period. Because of an internationally high population density in Japan, her productivity (average and marginal) of agricultural labor was kept so low. As is illustrated in the upper part of Figure 3, the marginal productivity of agriculture was much smaller than the subsistence level of income in the early stage of industrialization. In this stage farmers income were determined at the subsistence level and consequently unskilled workers (almost supplied from agriculture) were available in the modern industry at almost constant wages (historically subsistence level tended to increase). It is said that in this case there existed 'unlimited supplies of labor, a la Lewis or surplus labor in agriculture. As the labor productivity of modern industry increased rapidly due to technological progress, on the other hand, the relative income share of labor (ratio of wages to average labor productivity) in the modern industry tended to decrease. This relation is illustrated in the power part of Figure 3.

According to our study on the labor market this type of surplus labor existed widely in agriculture as well as small-scale enterprises in non-agriculture throughout the prewar period except of the W.W.I boom years when the demand for labor increased and real wages were raised.

E. Consequences

A most important effect of the industrialization in the prewar period was an increase in per capita real GNE. For 1889-1938 this increased annually at the rate of 2.1% which was much higher than any western countries. Real personal consumption expenditure per capita, a better index for the living standards, grew at the rate of 1.5% for the same period a lower figure than the per capita GNE due to a decline in the share of consumption expenditures of total GNE. Consumption patterns changed considerably; the share of food expenditure in total expenditures, Engel's coefficient, decreased from 65.9% in 1880 to 49.0% in 1938.\textsuperscript{11}

\textsuperscript{10} \textit{Ibid.}, Table 3-2 for population and Table 6-1 for GNE.

\textsuperscript{11} \textit{Ibid.}, Table 11-6.
Figure 3
Model of Theory of Turning Point

Notes: $E_L$ = output elasticity of labor.
Sources: Economic Development of Japan (English version), Figure 9-9.
However the rapid industrialization was not free from negative effects; a worsening income distribution was one of them. As was mentioned in the above, the relative income share of labor in the non-primary industry decreased for the prewar period; it was 67.8% in 1900 and 48.1% in 1938.\textsuperscript{12} Studies by several authors including myself have revealed an expansion of wage differentials. Wage differentials between agriculture and industry increased from the beginning of this century until the end of the prewar period, and those between the small-scale and the large-scale of enterprises in the industrial sector expanded especially in the 1920s. These facts together signify a worsening income distribution.

A direct estimation of the size income distribution in the prewar period has been becoming possible by means of collecting local tax data in various villages, towns and cities by the present author. A preliminary study based on this data has revealed several things. Firstly, income distribution was much more unequal in towns and cities than in villages: in Yamaguchi Prefecture in 1937, for instance, Gini coefficient was 0.563 in three towns and cities and 0.476 in five villages. Secondly, income distribution was undoubtedly unequal in the prewar period than in the postwar period (we will refer to the postwar situation later). Thirdly, income distribution became more unequal in the 1920s and 1930s in urban areas: Gini coefficient was 0.536 in 1923 compared with the 1937’s figure.\textsuperscript{13}

Taking into consideration of these scattered facts it can be stated that income distribution in Japan as a whole tended to become more unequal in this century. The regressing income distribution was a negative consequence of the rapid industrialization. This caused a serious dissatisfaction of the low income classes such as tenant farmers and unskilled workers in the small-scale industrial enterprises. The dissatisfaction of these people caused social and political instability in the 1920s and the early 1930s. This instability caused an emergence and spread of fascism and imperialism, which finally resulted as a tragedy of the Japan’s invasion to neighbouring countries and the Japan’s defeat in W.W.II. Thus, no one can state without hesitation that a positive effect of the industrialization did cancel out a negative effect. This dark side of Japan’s history should be taken into the consideration by developing countries which intend to realize the rapid industrialization.

\textsuperscript{12} Ibid., Table 9-5.
\textsuperscript{13} Ibid., Table 11-7.
IV. Reconstruction and Economic Reforms after W.W.II

A. Outlook

The Japanese economy went increasingly on to a wartime footing with the beginning of the war with China 1937 and the Pacific War in 1941. With the establishment of the National General Mobilization Law in 1938 the government's control over the private economic activities became substantial.

With the defeat in 1945 Japan was in such a serious economic conditions, because of no imports of raw materials, destruction of production facilities and so forth. Coupled with this set back in production, the distribution of all remaining funds to soldiers returning to their homes immediately after the war gave rise to violent inflation. To combat this inflation the occupation forces (SCAP) took the emergency financial measures including freezing a large portion of bank deposits in 1946.

During 1946-47 SCAP ordered important economic reforms; the dissolution of the zaibatsu, land reforms, and the passing of a law which gave full rights to trade unions. (To these reforms we will refer later.) In 1946 the government introduced the Differential Production Scheme; coal mines were given first claim to iron and steel, and the extra coal produced as a result was used for the production of iron and steel. It was believed that these two industries would lead to growth in other industries. By about 1948 the economy was on the road to recovery, but inflation still persisted. In 1949 a tight money policy, which is called as the Dodge Plan, was implemented. (We will refer to this in the below.) The occurrence of the Korean War in 1950, which caused the emergency demand for large amounts of military supplies by the USA, gave an impetus to the economic recovery.

B. Dodge Plan

Here I like to give a detailed explanation of the devises taken by SCAP and the Japanese government, and to try to evaluate their effects. The Dodge Plan in 1949 established the balanced budget by means of cutting industrial subsidies and suspending public financing to the industry, and replaced the multi-exchange rate system (the exchange rate had been fixed at different levels by kinds of commodities) by the unique exchange rate system. The balanced budget decreased considerably money supply to mitigate inflation and the price control which had started in the interwar period was banned. By the abolition of various industrial assistance by the
government and the introduction of unique exchange rate system. Japanese industry was thrown out in stormy seas of the market economy.

It has been widely accepted that the hyperinflation was settled down by this tight monetary policy, but a careful investigation of price and production statistics leads us to a different conclusion. Truth is that market prices of production goods and those of consumer goods already begun to decrease on February and April respectively in 1949, before an execution of this policy. Price decline was caused by a recovery of production activities: the manufacturing output index (100 for September 1946) decreased to 94.1 on March 1947, but increased to 112.0 on September 1947, 141.9 on March 1948, and 193.3 on September 1948.14

Although the recovery was dependent on supply of raw materials by SCAP, one should refer to the effect of the Differential Production Scheme in 1946. Due to this devise the production of coal and iron and steel began to increase already in 1947. In this year coal production recorded an increase of 33.6% over the previous year, and in 1948, 23.8% increase. Blister steel production showed a 70.9% increase over the previous year in 1947, and a 80.1% increase in 1948.15

These historical events signify that the tight money policy without any devises to stimulate production would not be successful in economic recovery. This conclusion has a significant implication to the radical reforms made by the previous USSR government according to the pressure of western authorities (i.e. IMF) in 1992. One cannot be free from apprehension that a result of the tight money policy would be a destruction of the production scheme. What are needed urgently would be the policy measures to keep and to stimulate production activities. In this respect the Japanese policy of differential production scheme may be worth consideration.

This argument does not necessarily deny a significance of the Dodge Plan, because this policy killed out the inflation. A more important effect of this policy, in my opinion, should be that this called back self-reliance of enterprises and stimulated their activities without subsidies by the government and with a severe competition with foreign companies. In other words the most important contribution of this policy was to create a driving force of the rapid economic growth since 1955. It should be men-

tioned furthermore that this success depended on the existence of a potential ability to enterprise managers with brisk entrepreneurship, excellent management techniques and so forth. Because this ability was an inheritance from the prewar period, we can say that the recovery from the destruction in the war (as well as the rapid economic growth) could not be fully understood without mentioning about an inheritance from the prewar period. Here lies a big difference between Japan immediately after the war and the previous USSR in present days.

C. Democratization Policies

The economic democratization policies by SCAP gave significant impacts to the economy. The first was the land reform in 1946-47: all the land belonging to absentee landlords and all except 1 cho (almost 1 hectare) of resident landlords’ land was forcibly purchased by the government and sold very cheaply to farmers. As a result the proportion of tenant farmers fell from 27 to 28% for 1910-47 to 5% in 1950. One of the major effects of this reform was to give an incentive for individual farmers, all land owners, to increase agricultural production. Another impact of the reform (coupled with the agricultural price support system) was an increase of farmers’ income, which expanded the rural market to stimulate the growth of industry and realized the very equal income distribution in agriculture as well as in the country as a whole.

The second was a series of measures to democratize the industrial sector. In 1945 SCAP declared its intention to dissolve the zaibatsu system, because they were believed to have created income differentials among the people and fostered militarism in the prewar period. During 1946-47 eighty-three companies were identified as holding companies and twenty-one of them were dissolved because they were family companies. The zaibatsu leaders, including members of the founding families, were barred from business. In 1947 two new democratization policies were taken. One was an enactment of the Anti-Monopoly Law, modelled on a US law but much more strictly applied. This law prohibited holding companies, company ownership of stocks and bonds, cartelization and so forth. Another was the Law for Elimination of Excessive Concentration of Economic Power of 1947. Although the law designated 325 companies to be partitioned into smaller units, only eighteen companies were actually affected as the Cold War made the reconstruction of the Japanese economy imperative. The Japan Iron and Steel became two companies and the Mitsubishi Heavy Industries was broken into three companies.

Although relaxed after the occupation army’s change of policy, these attempts at economic democratization brought about a drastic transforma-
tion in the industrial organization; the monopoly of the large enterprises was weakened, entry into industries became easier and competition increased significantly. These transformation gave an institutional foundation for the rapid economic growth.

The third item of democratization policies was to enact the law to give full right to trade unions. This is believed to have made a contribution in raising wages in the non-primary sector to expand the domestic market for the industry.

The aforementioned democratization policies (especially the land reform and the dissolution of zaibatsu) contributed to creation of a society with an equal income distribution. Gini coefficient was merely 0.361 in 1965, which was much smaller than our estimates for the prewar period (larger than 0.5).\textsuperscript{16} Although the drastic improvement of income distribution was due not only to the democratization policies, but to the destruction of the wealthy physical assets by the war and to the fall in value of their financial assets in the severe inflation immediately after the war, we should evaluate properly the significance of the radical policies such as the land reform and the dissolution of zaibatsu.

The impact of the land reform is easily understood by comparing the successful economic growth in the countries which realized the land reform (Japan, Korea and Taiwan) and the economic difficulties and social and political instability in the countries which did not make the land reform (the Philippines and Latin American nations). Also the importance of the modernization of industrial structure (dissolution of zaibatsu and anti-monopoly devises) may be evident when we compare the Japanese case with contemporary Korea in which the dominance of zaibatsu is believed to have caused serious economic and social problems.

V. High-Pitched Economic Growth

A. Rapid Economic Growth

As is shown in Figure 1 the economic growth rate showed a considerable rise since the mid-1950s and for about ten years from the end of 1950s recorded such a high level as high as ten percent (the average rate of growth was 9.4% for 1955-70). This rapid economic growth was really unprecedented in the Japanese history and one of the noticeable events in the world economic history.

\textsuperscript{16} Economic Development of Japan (revised Japanese version), Table 11-7.
The rapid economic growth was necessarily associated with a structural changes of the economy. In 1955 primary industry occupied still 16.7% of real GDP (at 1985 prices), but the share decreased to 5.9% in 1970, while the share of non-primary increased remarkably from 83.3% to 94.1% during these fifteen years. Among non-primary industry the industry’s growth was more evident; its share increased from 29.3% to 47.5% compared to an increase in the service sector’s share from 54.0% to 46.6%.\textsuperscript{17} Growth of the industry was largely on the manufacturing growth (the growth rate was 15.0% for the years of 1956-70).\textsuperscript{18} The manufacturing growth was mainly accounted for by the heavy industrialization: a share of the heavy industries (defined in Section III) in real output (at 1985 prices) increased from 39.1% to 60.3%, while a share of the light industries (defined in Section III) decreased from 35.4% to 22.7% from 1955 to 1970.\textsuperscript{19} Thus one can state that the driving force of the rapid economic growth was the heavy industrialization.

The economic growth and the heavy industrialization were also closely related with the expansion of exports. The real exports of goods and services increased at a surprisingly high rate of 13.8% for 1955-70,\textsuperscript{20} compared with the Japan’s economic growth rate of 9.4% and the growth rate of world trade of 7.3%.\textsuperscript{21} Japan’s export competitiveness improved but not significantly; the major factors for the export expansion was attributable to two factors. The first and basic element was the expansion of world market as a result of economic growth in many countries and institutional factors such as the decrease in customs duties of developed countries due to the Kennedy Round (1967-71). The second was a high income elasticity of Japanese exports, which signified a large response to the world demand: the Japanese industry was concentrated in production of ships, rolling stock and other products with a high income elasticity.

The rapid economic growth can properly be accounted for basically by referring to two factors; technology and capital formation.

\textbf{B. Technological Progress}

The ‘residual’ of the growth rate of mining and manufacturing, shown in Figure 4, demonstrates that technological progress was rapid in the period of consideration. It was 8.2% for 1956-70, which explained a

\textsuperscript{17} Ibid., Table 5-4.
\textsuperscript{18} Ibid., Table 5-2.
\textsuperscript{19} Ibid., Table 5-7.
\textsuperscript{20} Ibid., Table 6-1.
\textsuperscript{21} Ibid., Table 7-1.
Figure 4

'Residual' of the Growth Rate in the Mining and Manufacturing Industries and Growth Rates of Technology Borrowing and Real R&D Expenditures

\[ \begin{align*}
\alpha & = \text{the growth rate of total factor productivity in mining and manufacturing.} \\
\gamma & = \text{the growth rate of real R&D expenditures (1985 prices).} \\
\lambda & = \text{residual of the growth rate.} \\
\end{align*} \]

Figures are all based on raw figures without moving averages.

Sources: Economic Development of Japan (revised Japanese version), Figure 5-4.

large part of the growth rate of output (15.1%) and that of labor productivity (11.1%).\(^{22}\)

The rapid technological progress was attributable to the introduction of foreign technologies. New epocal technologies including petrochemical and atomic technologies had been developed intensively during the war time in the USA and other western countries and not introduced to Japan. Consequently there was a huge technological gap between the USA and Japan. This signifies that Japan was in a position to be able to exploit the backlog of new technologies of the USA. In Figure 4 the

\(^{22}\) Ibid., Table 5-2.
growth rate of the number of cases of introducing technology increased, reaching a peak in 1960 and then decreased.

In the postwar period compared with the prewar period the importance of R&D activities was considerable. The real R&D expenditures showed a high rate of growth in the period of rapid economic growth. Here it should be worth of mentioning that there was a close correlation between the growth rate of real R&D expenditures and that of the number of borrowed technologies. This implies that R&D in Japan did not substitute for, but complemented borrowed technology. In other words the Japanese R&D activities aimed not at basic researches, but mainly at an adaptation of introduced technologies: to develop new and better commodities based on imported basic technologies and to develop better and cheaper commodities by modifying foreign ones. Although Japanese R&D activities were not creative, it was an appropriate strategy for one of the late comers with a lag in science and technology behind the developed countries.

Finally, we like to say a few words to the social capability to absorb foreign technologies. In the postwar period this capability was believed to be much larger than the prewar period and to have increased in the postwar period. These changes included an increase in the number of engineers and a rise in their quality, an increasing level of science, an improvement in transportation and communication networks which facilitated technical progress and so on.

Also it should not be neglected that the technological transfer from the USA was always accompanied with an introduction of wide-range of culture. The American culture gave extremely large impacts on the Japanese culture and society, both in a good sense and in a bad sense. Generally speaking the substantial technological transfer can not be realized without an introduction of culture. Korea, who has been keen to transfer technologies from Japan, has refused obstinately (at least officially) to introduce the Japanese culture. To the author this policy and attitude of Korea does not seem to be prudent.

C. Capital Formation

In this period real capital formation (gross fixed capital formation) showed a remarkably high rate of increase; 14.7% for 1955-70,23 which was much higher than the growth rate of real GNE. As a result, the investment rate showed a rapidly increasing trend, and exceeded a 30%-level at

23 Ibid., Table 6-1.
the end of the 1960s. This was one of the main factors for the rapid economic growth.

The animated investment activities (mainly by private enterprises) could be attributed basically to the high expected rate of return to capital, which was mainly due to the rapid introduction of new technologies. Here we must refer to an importance of the institutional framework; the very competitive industrial organization, which had been established by the reforms immediately after the war. Severe competition among industrial firms stimulated the introduction of foreign technologies and capital formation. Therefore one may be able to say that the rapid economic growth would have not been in a case without the reforms.

How financed the investment was? In this period as well the domestic investment was financed mainly by domestic savings: a proportion of domestic net savings to gross savings was 65-69%, while a proportion of provisions for capital consumption was 31-35%. Major source of net savings was from households; a proportion of household savings was 32-35%, compared with proportions of private corporations (13-15%) and of general government (17-21%). The large proportion of household savings was attributable to a high rate of personal savings.

The rate of personal savings, which was merely 8% in 1953, increased in the rapid economic growth period and reached at a high level exceeding 20% at the end of the 1960s (Figure 5). The increase in the rate may be accounted for basically by the rapid increase in income. As the factors for the internationally high level at the end of 1960s one may point out the relatively young population structure (the saving rate is smaller for older people), the relatively undeveloped social security system (in this case people have to take care of their lives after retirement by themselves), the relatively higher proportion of self-employed workers (their savings contain savings for investment in their business), and so forth.

D. Consequences

One of the important consequences of the rapid economic growth was a disappearance of surplus labor in around 1960. The rapid growth of industry created the large demand for labor and caused a considerable decrease in the number of agricultural laborers in the latter half of 1950s. The decrease in agricultural labor force and the mechanization of agricultural production (they were closely associated with each other) raised labor productivity of agriculture. The marginal labor productivity was

24 Ibid., Table 6-10.
believed to exceed the subsistence level of income or the Lewisian turning point, which is denoted as T in Figure 3, was passed (the labor market shifted from the labor surplus to the labor shortage phase). Consequences of this event included a decrease in wage differentials between the industry and agriculture and between the large and small-scale enterprises in the industry, and a rapid increase in wages in all industries (wages deflated by the consumer price index in all industries as a whole increased at 8.0% for 1956-70).\textsuperscript{25}

The second and most important consequence was a remarkable improvement in people's living standard. Japan's per capita GNE increased at an annual rate of 8.3% at constant prices, and Japan was considered as a developed country rather than a medium developed or a developing country at the end of 1960s (the landmark for this was Japan's alliance to OECD in 1964).

It is important that the increase in per capita income was realized without worsening of the income distribution. According to R. Wada's estimates, Gini coefficient increased from 0.313 in 1956 to 0.382 in

\textsuperscript{25} Ibid., Table 9-10.
This was attributable to the widening wage differentials due to the rapid industrialization with surplus labor. However, Gini coefficient estimated by T. Mizoguchi decreased from 0.361 in 1963 to 0.350 in 1973. The progressing income distribution was due to the narrowing wage differentials in the labor scarce economy.

That is to say, the low level of Gini coefficient at the end of the rapid economic growth period were accounted for by two elements: the first was a low level at the starting point of the rapid economic growth (one of the consequences of the reforms after the war and of a decrease of wealthy's assets), and the second was a decline after the turning point (about 1960). However, as the decline after the turning point was decisively smaller than the increase for the years before the turning point, one may conclude safely that the equal income distribution at the end of the rapid economic growth was due mainly to the institutional changes immediately after the war rather than an economic factor; the change in labor market.

This conclusion has two implications. The first is an importance of the institutional change in determining income distribution. In Korea, according to the newest study by Ahn, Kook-Shin, income distribution has regressed significantly in the 1980s and social and political situations have been unstable. They have to consider more seriously a drastic change of the industrial organization including the dissolution of zaibatsu, an execution of the stronger anti-monopoly policy, and the growth of small and medium-scale enterprises. The second is that the so-called ‘reversed U-shape’ hypothesis of S. Kuznets, which postulates income distribution tends to regress in the early phase of industrialization and turns to a progressing phase after a certain point of time, was not fully applicable to Japan. The increase in Gini coefficient in the prewar period and in the early postwar years before the Lewisian turning point in 1960 and the decrease in the 1960s are consistent with the Kuznets’ hypothesis. However the latter decrease was so small compared with a gap between


27 Economic Development of Japan (revised Japanese version), Table 11-7.

the prewar and postwar periods. In Korea Gini coefficient has increased even after the turning point sometime in the early 1980s.\textsuperscript{29} This seems to conflict with the Kuznets' hypothesis.

The rapid economic growth of Japan had also a dark side. The most important negative consequence was the substantial environmental pollution, which injured people's health. After this problem became evident at the end of 1960s, the government made positive devises to prevent the pollution; the law to compel the enterprises to improve production facilities not to pollute air and water was enacted in 1970, and the Bureau of Environment was established in 1971 in order to enforce the law.

It is difficult to argue which was bigger the positive and the negative effects? An attempt to evaluate them quantitatively is an estimation of the net national welfare (NNW) per capita, which is personal consumption expenditure plus an imputed wage for leisure and housework and so forth, minus expenditure on pollution control. The growth rate of NNW per capita was 6.2\% for 1955-70,\textsuperscript{30} which was much smaller than the growth rate of real GNE per capita (8.3\%). This stands for that a part of the economic growth was cancelled out by the environmental pollution.

During 1970-75, although the growth rate of per capita GNE decreased to 4.0\%, that of per capita NNW increased to 7.8\%.\textsuperscript{31} The increase in the latter was due to the detrimental effect of pollution, a decrease in the number of road deaths, and an increase in leisure time. Thus a possible increase in the welfare of the people was a result of not only economic growth but also of the efforts to prevent pollution. This seems to have a significant implication to Korea, who has been suffered from various environmental problems.

VI. Transition to the Slow Economic Growth

A. Transition

The economic growth rate demonstrated a sharp decline since the end of the 1960s and reached at a low level of 3-5\% in the mid-1970s (Figure

\textsuperscript{29} H. Choo, p. B.
1). Among many factors accounting for the transition we like to point out three. The first was a deceleration in the technological progress. The decelerating technological progress was caused by the retardation of technological development in the world and a decrease (or a disappearance in some industries) in the technological gap between the USA and Japan. Figure 4 demonstrates a decrease in the rate of technological progress, and a sharp decrease in the growth rate of the number of cases of importing technologies for the period in consideration.

The second was a change-over of the economic policies of the other developed countries. OECD countries, which were confronted with inflation in the 1960s, banned the Keynesian economic policies to aim at the rapid growth and full employment. This gave a negative effect on the Japanese economy.

The third was a sharp increase in oil prices at the first oil crisis in 1973. This deteriorated a basis of the oil-consuming heavy industries such as iron and steel and petro-chemical industries, a driving force of the rapid economic growth, and necessitated a growth of the oil-saving heavy industries such as precision machinery. This change of the industrial structure caused a decline in the production efficiency in the manufacturing industry as a whole.

B. Slow Economic Growth

Since the mid-1970s until the recent years the economic growth rate and the growth rate of per capita product have remained at a low level (Figure 1). They are 4.4% and 3.6% respectively for 1971-88. Almost all factors responsible for the rapid economic growth in the past days have disappeared. However the economic growth of Japan demonstrates a much better performance than the other developed countries. In Japan the growth rate is higher, the inflation rate is lower, and the unemployment rate is smaller.

Factors for the relatively better performance of the Japanese economy are the relatively rapid technological progress and the relatively brisk capital formation. The ‘residual’ of the growth of manufacturing has been 3.9% (Figure 4), which should be higher than the other developed countries. The technological progress in this period is a substantial diffusion of ME (combination of mechanics and electronics) technologies in the all over the industrial activities including service sector. Now Japan is the most developed country in this field; the rate of diffusion of robots is the highest in Japan.

The investment rate is still much higher in Japan than the other
developed countries. For the years 1986-90 (based on raw figures without moving averages) the rate is 29.1% in Japan, compared with 16.9% of the USA, 19.9% of previous West Germany, and 18.4% of the UK (Figure 6). In this diagram one may easily find a correlation between the investment rate and the economic growth rate. This relation supports our hypothesis that the relatively high rate of investment accounts partly for the relatively high growth rate. Furthermore it is noticed in this diagram that the investment rate is so high in some Asian countries such as Korea,

Figure 6

Relationship between the Economic Growth Rate and the Investment Rate 1986-90

<table>
<thead>
<tr>
<th>G(Y)</th>
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</tbody>
</table>

Notes:  
α = investment rate = gross domestic fixed capital formation divided by GNE.  
G(Y) = economic growth rate = growth rate of real GNE.

Both figures are averages for 1986-90.

1. Singapore  
2. China  
3. Korea  
4. Indonesia  
5. Japan  
6. Thailand  
7. West Germany  
8. Italy  
9. UK  
10. USA

Sources: Economic Development of Japan (revised Japanese version), Figure 6-3.
Singapore, China, Indonesia, and Thailand. This is one of the major factors for their rapid economic growth.

The relatively high investment rate are associated with the relatively high rapid technological progress and backed up by an expansion of savings. Savings came largely from households: in 1987 a proportion of household savings in total gross national savings is 35.4%, compared with 9.8% of private corporations and 20.2% of the general government (the residual 34.6% is the provision of capital consumption). The personal savings rate decreased from a high level exceeding 20% at the beginning of the 1970s to less than 15% at the end of the 1980s (Figure 5), due to the substantial diffusion of social welfare system in 1973, the aging of population, the diffusion of consumer credit and so forth. However it is still high compared with the other developed countries: according to a figure for a single year, it is 14.1% in 1990, which is comparable with Italy (14.4%), Germany (13.9%) and France (12.2%), and still higher than the USA (7.3%) and the UK (4.9%).

The most remarkable phenomenon in this period is the evaluation of yen. The exchange rate of a dollar to yen, which was fixed at the 360 yen level since 1949 until 1970, decreased to 254 yen in 1985. Since 1986 until now it has been in the range from 122 to 160 yen. The evaluation gave great impacts to the economy. It is contributed to a stable domestic prices due to a decline in import prices. On the other hand it has raised wages in terms of dollars and necessitated the Japanese industry to take measures to save production costs; the rationalization of the production structure and management and the improvement of production facilities. Consequently the international competitiveness of the Japanese exports has increased; the ratio of Japan's export prices to world prices (both in terms of dollars) decreased from 166 in 1971 to 129 in 1988 (100 for 1985). As a result of this, in spite of the decelerated economic growth in the world, real exports of Japan recorded a high rate of growth of 7.5% for this period.

Another response to the yen evaluation of the Japanese industry other than the endeavors to save domestic production costs was an expansion of the direct investment to foreign countries. As a result, in present days

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32 Economic Development of Japan (revised Japanese version), Table 6-10.
35 Economic Development of Japan (revised Japanese version), Figure 7-4.
36 Ibid., Table 6-1.
light industry products (i.e. textiles) and low-quality consumer durables (i.e. electric appliances) are almost exports. (The Japanese industry has concentrated on production of high-quality consumer durables.) The substantial expansion of direct investment has retarded the industrialization; the industry's share of real GDP (at 1985 prices) was 47.5% in 1970 and 46.0% in 1987, while the service industry's share increased from 46.6% to 51.2% for this period.\(^{37}\) Japan is now in the stage of economic development in which the service industry is more important than the industry.

VII. Selected Conclusions and Implications

The short survey of the history of the Japan's economic development in this paper may give us some conclusions and implications.

A. Continuity vs. Discontinuity of History

The impacts of the epochal events such as the Meiji Restoration and the economic democratization policies immediately after W.W.II were considerable. The former reform opened a way to a modern state and established a basis for the modern economic growth which started about twenty years later the Restoration. The latter modernized the Japanese economy and society and founded a basis for the coming unprecedented rapid economic growth. This is a good example for the discontinuity in economic history. However our study showed that the beginning of the modern economic growth was due largely to the inheritance from the Tokugawa Period, and the economic reconstruction from ashes immediately after the war was realized based on the inheritance from the prewar period. The history can be properly understood by taking considerations of both aspects, continuity and discontinuity.

B. Role of Government

In the history of Japan government has played a significant role. This was most evident in the early Meiji Period: it carried out several policies to modernize the society and economy. However the big role of government in the early phase of industrialization was not unique to Japan but can be widely seen in the late comers such France, Prussia, Austria and Russia in the eighteenth and nineteenth centuries, and the Asian countries such as

\(^{37}\) Ibid., Table 5-4.
Korea and Taiwan which made a success in the economic take-off after the war.

The government's role decreased after the early Meiji Period and the basic attitude of the government became laissez-faire. However the intervention of government, which was considerable during the war and the period of turmoil that followed, decreased but has been still significant even after the reconstruction until now. Nowadays it is becoming to be realized by the people that the intervention sometimes hampers the process of economic growth (i.e. too much subsidies to agriculture has twisted appropriate resource allocation of the economy). Generally speaking, in my opinion, the role of government cannot be properly evaluated without a consideration of the stage of economic development. In Korea, which is now in a transition to a developed country, the strong government, which has contributed to the economic growth until now, should be reconsidered.

C. Importance of Private Activities

The success of Japan in economic development depended more on the private activities rather than the government role. Even in the case of economic take-off in the early Meiji Period, a basic prerequisite for its success was the positive response of the private sector to the government policies. A similar thing can be seen in the reconstruction after the war; the private enterprises could respond to the 'shock therapy' of the Dodge Line. Furthermore it was studied in this paper that since the beginning of the economic growth until recent years capital formation and the introduction of foreign technologies by the private enterprises have been a driving force of the economic growth. Policies not to impede private activities and to grow private enterprises are imperative.

D. Trade-Off between Growth and Equity

The industrialization in the prewar period, which was carried out under the dominance of zaibatsu in the non-agriculture, the rule of land-tenant system in agriculture and the existence of substantial surplus labor in all industries, caused the regressing income distribution. The regressing income distribution was responsible to some extent for the social and political instabilities in the 1920s and the early 1930s, which caused the emergence of fascism and imperialism. This can be considered as a typical example for an evil influence of the regressed income distribution. It was due to the economic democratization policies by the occupation forces immediately after the war that made the income distribution of Japan equal
in the international standard. The passing the turning point or the disappearance of surplus labor around 1960 made a contribution to the equalization of income distribution, but this contribution was definitely smaller than the impact of the economic reforms. Without the drastic reforms of the system which was responsible to the unequal income distribution, any countries confronted with the unequal distribution do not seem to be able to resolve this problem.

References


