

Japan's High-Growth Postwar Period: The Role of Economic Plans

Shinji Yoshioka and Hirofumi Kawasaki

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Economic and Social Research Institute
Cabinet Office
Tokyo, Japan

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Preliminary

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(Abstract)

Japan experienced a high-growth period from the mid-1950s to the early 1970s. This study explores the economic situation and policy coordination of the period, in particular focusing on the important role of economic plans and their indicative role for both economic policy coordination in the government sector and guideline information supply for the private sector, along with short-term policy coordination and analyses on the economy by annual and monthly economic reports. Some related policies to economic plans, including fiscal policy, monetary policy, and industrial policy, etc., are also included. Additionally, this study not only reveals the Japanese development process but also provides additional benefits for the government authorities and private sector businesspersons in developing countries to help to catch up to the advanced economies.

Keywords: High Growth, Economic Plan, Japanese Development Process

JEL Classification Numbers: E20, H10, N15

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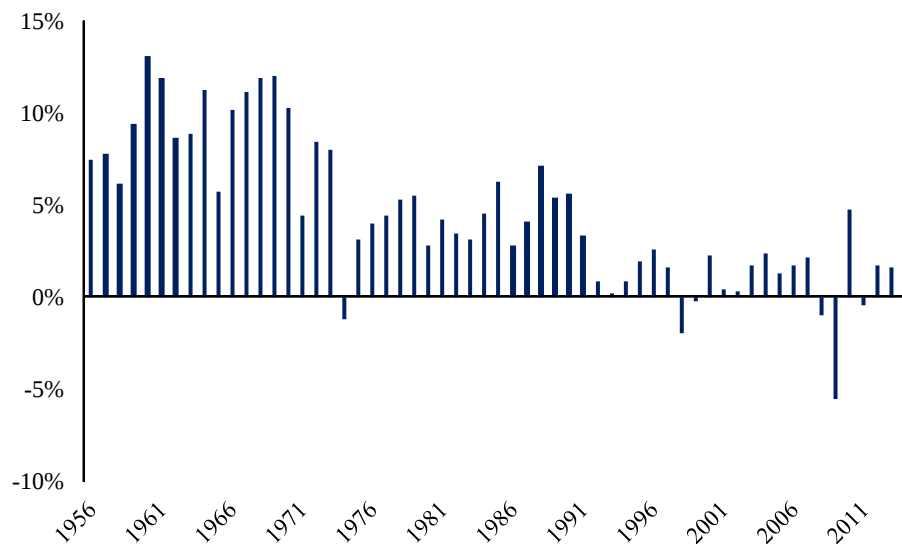
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1. Introduction

In postwar Japan, we experienced a high-growth period for approximate 20 years, from the mid-1950s to the early 1970s. The real GDP/GNP growth rate frequently exceeded 10 percent during this period. Figure 1-1 depicts the general development of Japan’s postwar growth rate. The Japanese economy shifted to stable growth in the early 1970s, to around 5 percent, after enjoying the high growth rate. Moreover, the bubble crash in the early 1990s caused lower growth, around 1-3 percent at present.

Figure 1-1: Real Growth Rate in Japan



Source: Cabinet Office.

Japan experienced a high-growth period from the mid-1950s to the early 1970s, as Figure 1-1 depicts. Many studies have explored the factors behind this economic growth, including Kosai (1980), Hayashi (1997), Yoshikawa (1992), and Ohkita (2010). Some of them insist on the importance of institutional and structural changes in postwar Japan under occupied armies’ control, such as agricultural land reform, *zaibatsu* dissolution, labor democratization, and so on, and others stress the roles of economic policies of Japanese government, such as industrial policies of MITI (Ministry of International Trade and Industry), among others. Many of these studies employ the growth theory application to Japan’s postwar economy, but few focus on features of economic development¹. This study applies a development economics focus to reveal findings about Japan’s postwar economy, in particular during the high-growth period. We imagine that these sorts of Japanese experiences may be helpful for development assistance to Asian developing countries. For these purposes, we take the approach of economic planning and its significant role to economic policy coordination process, and

¹ We find out that Sadahiro (1991, 1992) and Ohno (2006) take this approach.

include some comprehensive surveys on standard development economics as appendices, derived from Lewis (1954), Rostow (1960), Harris and Todaro (1970), and so on.

Apart from this introduction, this study consists of several additional chapters: the second chapter focuses on macroeconomic policy management, in particular, the role of economic plan; the third chapter reveals Japan’s economic situation in the immediate postwar period, which means before the planning exercises; the fourth chapter historically overviews Japan’s economic plans during the high-growth period in the 1950s and 1960s, which are the Five-Year Plan for Economic Self-Support (FY1956-60), the New Long-Range Economic Plan (FY1958-62), the National Income Doubling Plan (FY1961-70), the Medium-Term Economic Plan (FY1964-68), the Economic and Social Development Plan (FY1967-71), and the New Economic and Social Development Plan (FY1970-75)²; the fifth chapter glances at the fiscal and financial systems at that time; the sixth chapter focuses on the relation between economic plans and industrial policy; the seventh chapter discusses how to liberalize and harmonize the domestic market in accordance with the international economy; the eighth chapter deals with the relationship between economic plans and comprehensive national development plans from the viewpoint of infrastructure building; the ninth chapter reports human resources development in economic plans, including social security, education, and so on; the tenth chapter highlights the involvement of the private sector and academic authorities to formulate economic plans; the eleventh chapter summarizes methodologies on economic forecast in economic plans, including utilization of econometric models; the twelfth chapter reveals the importance of short-term policy coordination apart from the economic plans; the thirteenth chapter focuses on policy coordination utilizing analytical reports issued regularly; and the final chapter concludes this study. In addition to these fourteen chapters, the appendices include modern economic growth theory and development economics, especially focusing on dual economy and business cycle analysis methodologies.

2. Macroeconomic Policy Management in Japan: The Role of Economic Plans

The market economy consists mainly of four sectors: households, corporations, government, and foreign sectors. At the goods and services markets, consumers buy goods and services to maximize their utilities under their budget constraints while corporations supply them to maximize their profit. On the other hand, in the labor market, households supply labor, which corporations demand. Considering cross-border transactions, some households buy imported goods, and some corporations also export and import goods. Financial transactions are included in both domestic and foreign markets. The market mechanism adjusts these demands and supplies according to prices. The Economic policies are official interventions of the government to the markets. The aim of government intervention is mainly to resolve market failure or to improve resource allocation in microeconomic

² “FY” means fiscal year, which starts in April and ends in March of following year in Japan.

aspects and to stabilize macroeconomic fluctuations. In general, macroeconomic policies consist of some measures; which are fiscal policy, monetary policy, industrial policy, antitrust policy, labor policy, and so on. This chapter mainly focuses on fiscal policy, monetary policy, and economic policy coordination employing economic plans in postwar Japan.

Among the economic policies completed by the government and the central bank, fiscal policy is one of the most important and contains three functions: (1) resource allocation; (2) income distribution; and (3) stabilization of macroeconomic fluctuation. The first function is to be completed by supplying public goods, including infrastructure, the second is by employing regressive tax systems, pensions, and other social security measures, and the third is by combination of several policies based on Keynesian economics. In Japan, the Ministry of Finance (MOF) has been in charge of the budgeting process, which is one of the most symbolic policies. In the market economies, the main and driving force of the economy is the private sector; purely theoretically, the price mechanism at the perfect competitive market would bring the optimal allocation of resources. External economies, monopolistic markets, and other so-called market failures, are sometimes exceptional. Among those, the supply of public goods would underrun the optimal level so that it is necessary that the government should intervene in the market, which is the basic theory of fiscal policy.

The Bank of Japan (BOJ), which is also called the central bank of Japan, plays a dominant role in monetary policy independently from the government. Usually, the central bank is committed to currency stability, through the adjustment of money supply and/or interest rates, which control macroeconomic aggregate demands³. In the words of “currency stability,” both domestic and foreign currencies are included. The former means price stability reflected in the consumer price index (CPI) or other representative deflator, and the latter is measured by the foreign exchange rate. Some central banks of both developed and developing countries, including the Bank of Japan, adopt an inflation targeting policy, in which a central bank has an explicit target inflation rate for the medium term and announces this inflation target to the public. Jahan (2012) provides more detailed explanations and practical examples of the inflation targeting policy. Along with this price stability, the central bank is responsible for financial stability, employing policies of prudence.

During the high-growth period of postwar Japan, the Ministry of International Trade and Industry (MITI) had been committed to industrial policy. The industrial policy was defined at Komiya (1975) as follows: “*The industrial policy is pointed as government policies that affect resource allocation among industries and private firms’ activities level in individual industry. That is, the industrial policies promote and/or depress production, investment, R&D, modernization, and industrial reform.*” Mainly, industrial policy has been regarded as a policy package to improve the performance of a

³ Federal Reserve Board (FED), the central bank of the United States, has the dual mandate of maximum employment and stable prices.

specific or aimed industry. In particular, capital crunch was a major problem⁴ so that MITI and other government authorities funded the required capital to industries of high potential.

In Japan’s postwar economy, several policy measures, including those mentioned above-, were available to promote economic activities, to modernize economic structure, and to stabilize macroeconomic fluctuations, but it was absolutely required to coordinate policy measures to avoid inconsistency. Economic plans were employed for this purpose and also played a significant role to stimulate private sector activities by revealing mid- and long-term economic directions and concrete forecasts. In other words, economic policy coordination employing economic plans were two-sided; one was to avoid the negative effects of inconsistency among policy measures and the other was to promote positive effects to enhance private sector activities by indicating the direction of government economic policies.

Describing the character of economic plans in postwar Japan, Furuya (1979, p.297) stresses that economic plans were recognized as “*Generalized Market Research*.” For example, the New Long-Range Economic Plan pointed out the following features:

- (1) The plan indicates the guidelines of economic policies under the free corporation and free market system;
- (2) The government expects that inventive ideas and energy would be the driving force to economic development, avoiding direct controlling measures as much as possible; and
- (3) The government intends to carry out the plans by indirect measures such as fiscal and monetary policies, etc.

This basic characterization of economic plans were taken over for posterior economic plans: For example, the National Income Doubling Plan stated that “this economic plan will be carried out under the free corporate and free market regime and will not enforce strict implementation in all economic fields,” and the Economic and Social Development Plan insists that “this plan reveals basic directions, priorities, and responsibilities of government activities, but for private sector activities, demonstrates desirable directions and the government indicates guidelines as necessary.” Economic plans in the market economy work as indicative and indicate desirable goals and/or guidelines for private corporations and households while those in a socialist economy are understood as the enforcing order to the private sector from the government⁵.

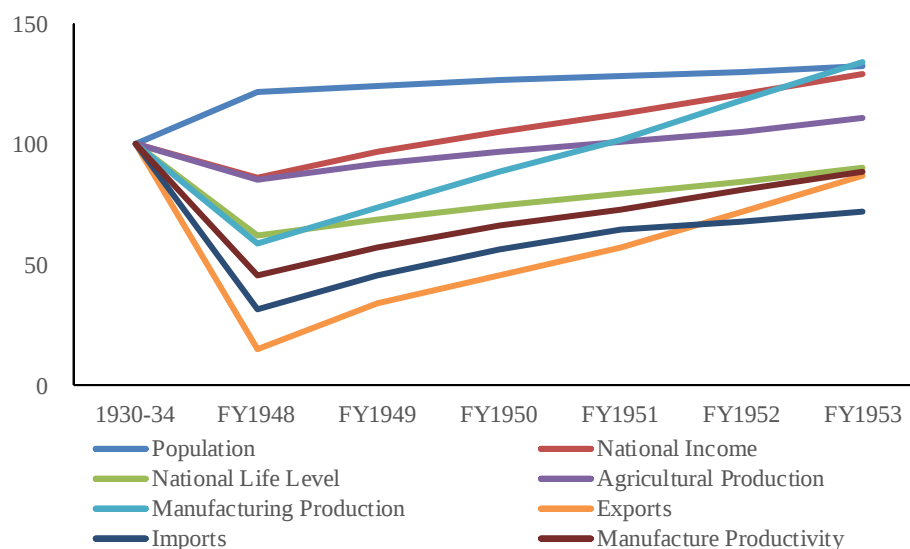
⁴ Furuya (1979) insists that Japan had lost a quarter of national wealth and one third of production capacity, but not so much of labor force due to the war.

⁵ Komine (1993) also stresses the indicative character of Japanese economic plans.

3. Japan’s Economic Situation in the Immediate Postwar Period

War II widely destroyed Japanese economic and social infrastructure and productive facilities. For example, Furuya (1979) insists that Japan had lost a quarter of its national wealth, and one third of production capacity due to the war. As the war ended in August 1945, economic and social statistics in 1945-47 were not available or not so reliable, therefore some economists focused on the Japanese economy in 1948 or later; the national income had dropped by around fifteen percent; manufacturing and mining production had dropped by close to forty percent; the population had increased by twenty percent. Figure 3-1 describes Japan’s postwar economic situation.

Figure 3-1: Postwar Economic Indicators (Unit: 1930-34=100)

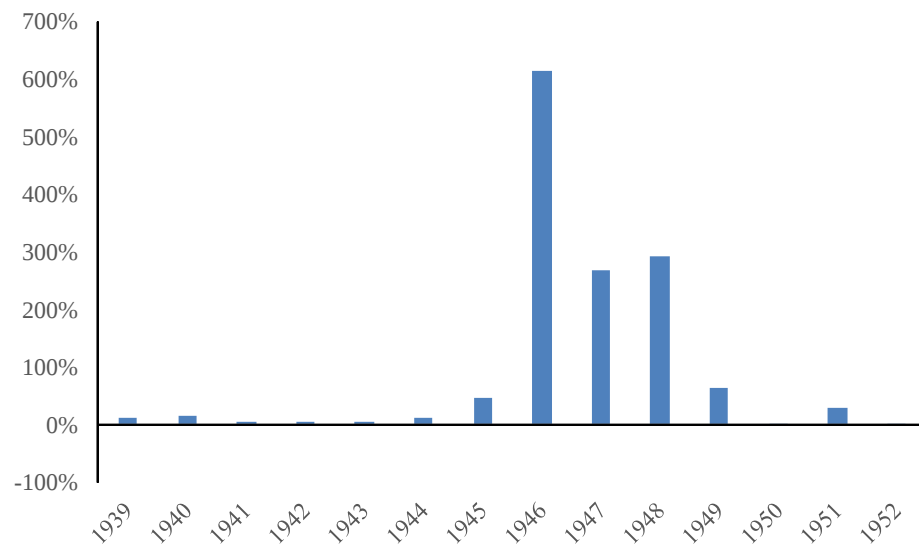


Source: Hayashi (1997) p.58

Moreover, retail prices had been rising very rapidly, partly owing to imbalances between demand and supply. But the extraordinary inflation hike had been supported by the underwriting of the Reconstruction Finance Cash Office bonds by the Bank of Japan and the comprehensive economic policy according to the Dodge Plan⁶ had ended this malignant inflation finally. Figure 3-2 depicts inflation in the postwar Japan.

⁶ More detailed information on the Dodge Plan and its Nine-Point Economic Stabilization Program will be provided afterward.

Figure 3-2: Inflation in Postwar Japan (Tokyo Retail Price Index)



Source: Hoshino (2003) pp.16-17

Kanamori and Omori (2016), Hashimoto et al. (2011), Hayashi (1997), and some other works point out that the framework of the Japanese postwar economy and its economic policies were designed by the GHQ (General Headquarter) of the Occupation authorities, to avoid another war. Since the GHQ regarded that the militaristic trends in Japan before the war had been originated from landowners and *zaibatsu* that supported the military, agricultural land reform and *zaibatsu* dissolution along with labor democratization were identified as the top priority.

In prewar Japan, the landlord system was widely in use, and the GHQ regarded this regime as one of the causal factors that had led Japan into the war because poor tenant farmers brought effective motivation to another war. The GHQ thus ordered the agricultural land reform that all of farmland owned by non-resident landowners and those except for reservation⁷ owned by resident landowners should be redistributed to tenant farmers. According to Miwa and Ando (2010, p.145), the proportion of tenant farmland had decreased from 45.9 percent in 1945 to 9.9 percent in 1950 after the agricultural land reform. Much of the literature points out that the *zaibatsu* (family-run conglomerates in prewar Japan) were also regarded as a driving force to World War II because they had been heavily involved in the military industries. The GHQ also ordered the dissolution of 15 *zaibatsu*, including Mitsubishi, Mitsui, Sumitomo, Yasuda, and so on, and introduced a free and competitive market system. The Diet of Japan had enacted the Act for Elimination of Excessive Concentration of Economic Power for this purpose. At present, the Anti-Monopoly Act has been executed for the same purpose in Japan. The GHQ also ordered the democratization of the labor system in Japan. In 1945, the Diet had enacted the Labor Union Act to ensure the right to organize, to bargain collectively, and to strike. Also, the diet

⁷ Reservation for resident landowner was approximate 4 hectares in Hokkaido, and 1 hectare throughout the rest of Japan’s mainland.

had enacted the Labor Relations Adjustment Act in 1946, and the Labor Standards Act in 1947, for the purpose of advancement of labor.

As Figure 3-2 depicts, the problem of inflation was widely recognized. Of course, inflation in postwar Japan was two-sided, which was caused by excess demand and shortage of supply, and was also a monetary phenomenon. In 1945, the government of Japan founded the Reconstruction Finance Cash Office (RFCO) to supply reconstruction money. The RFCO had issued RFCO bonds, and the Bank of Japan had immediately underwritten these bonds and printed money. This excessive money supply had directly caused extraordinary inflation and indirectly caused excessive demand. On the other hand, the war had mostly destroyed production facilities in Japan, and Japan had lost the colonies that had formerly provided some raw materials, and had had very little access to international trade system to procure materials and fuels, etc.

To curb this extraordinary inflation, two-sided measures had been taken: the priority production system to enhance supply and the Dodge Plan to compress demand. First, the government of Japan had implemented the priority production system, which distributed limited materials, fuels, funds, and labor focused on coal, steel, fertilizer industries, and so on, to promote production. On the other hand, the GHQ had invited Mr. Dodge to advise some economic policies, which had been called the Dodge Plan, to reduce demand by cutting government deficits. The priority production system was advised by Professor Arisawa⁸ to the Prime Minister Yoshida and was expected to work as follows:

- (1) Infusion of imported heavy oil in the production of steel;
- (2) Concentrated infusion of steel products in coal mines; and
- (3) Infusion of coal in the production of steel, and so on.

In fact, beginning in January 1947, 30 million tons of coal output were realized in the second half of the same year. At the same time, through the priority allocation of funding by the RFCO was supplied to priority industries, facilitating corporations raising funds that otherwise would have become the bottleneck in the economic recovery. But these funds were supported by loans of the RFCO so that the total money supply increased, causing an acceleration of inflation. Finally, the Dodge Plan curbed extraordinary inflation with the Nine-Point Economic Stabilization Program⁹ unveiled in

⁸ Hiromi Arisawa (1896-1988) was a leading economist in the postwar Japan. He was a professor of Tokyo University and later became the president of Hosei University (1959-62). He also served as a member of the Atomic Energy Commission of Japan.

⁹ The Nine-Point Program was released by the State and Army Departments in response to the request in NSC 13/2, October 7, 1948. As described in NSC 13/2, Washington viewed that more austere measures would be necessary to fight against inflation than the Tokyo plan. NSC 13/2 recommended, “we should make it clear to the Japanese Government that the success of the recovery program will in large part depend on Japanese efforts to raise production and to maintain high export levels through hard work, a minimum of work-stoppages, internal austerity measures and the stern combating of inflationary trends including efforts to achieve a balanced internal budget as rapidly as possible.” Joseph Dodge (1890-1964) was a banker and served as an economic adviser for postwar economic

December 1948 as follows:

- (1) Balance of budget;
- (2) Reinforcement of tax collection;
- (3) Restriction on credit extension;
- (4) Wage stabilization;
- (5) Price control;
- (6) Control on foreign trade and exchange;
- (7) Material allocation for promotion of exports;
- (8) Enhancement of production of domestic raw materials/products; and
- (9) Reinforcement of food collection.

Implementing the above program, the Diet approved so-called “over balanced” budget for both FY 1949 and 1950. The initial budget went from ¥414.4 billion in FY 1948 to ¥704.9 billion in FY 1949, a hefty 70.1 percent increase. But the reasons for this increase were, first, projected rises in nominal expenses due to the extraordinary inflation and, second, increases in price adjustment subsidies. The latter, in particular, was the result of the transfer of a hidden subsidy for exports and imports that had been paid from trade funds to the General Account of the budget. At last, the 360 yen-per-dollar fixed exchange rate came into being under the Bretton-Woods regime, which opened global exporting and importing markets to Japan. While inflation was controlled with implementation of the Dodge Plan, the Japanese economy suffered from severe deflation because of deficient demand. This depression of the economy was, however, resolved by the Korean War in 1950-53. Table 3-1 reports special procurement caused by the Korean War. According to the Five-Year Plan for Economic Self-Support (FY1956-60), GNP in FY 1954 was ¥7,241 billion and the special procurement brought the independent demand of \$20.114 billion, which means that the special procurement order in each year generated by the Korean War was accounted as around 1-2 percent of GNP¹⁰, using the 360 yen-per-dollar fixed exchange rate. Until around 1955, by grace of these sizable and independent demands, the Japanese economy had recovered its prewar level activities as indicated at Figure 3-3. And a few years later, the 1956 Annual Economic Report proudly declared “*It is no longer termed postwar.*”

stabilization programs. He drafted and implemented financial and currency reforms in West Germany for 1945-48 just before he was dispatched as the adviser to the Supreme Commander for the Allied Forces (SCAP), General Douglas MacArthur.

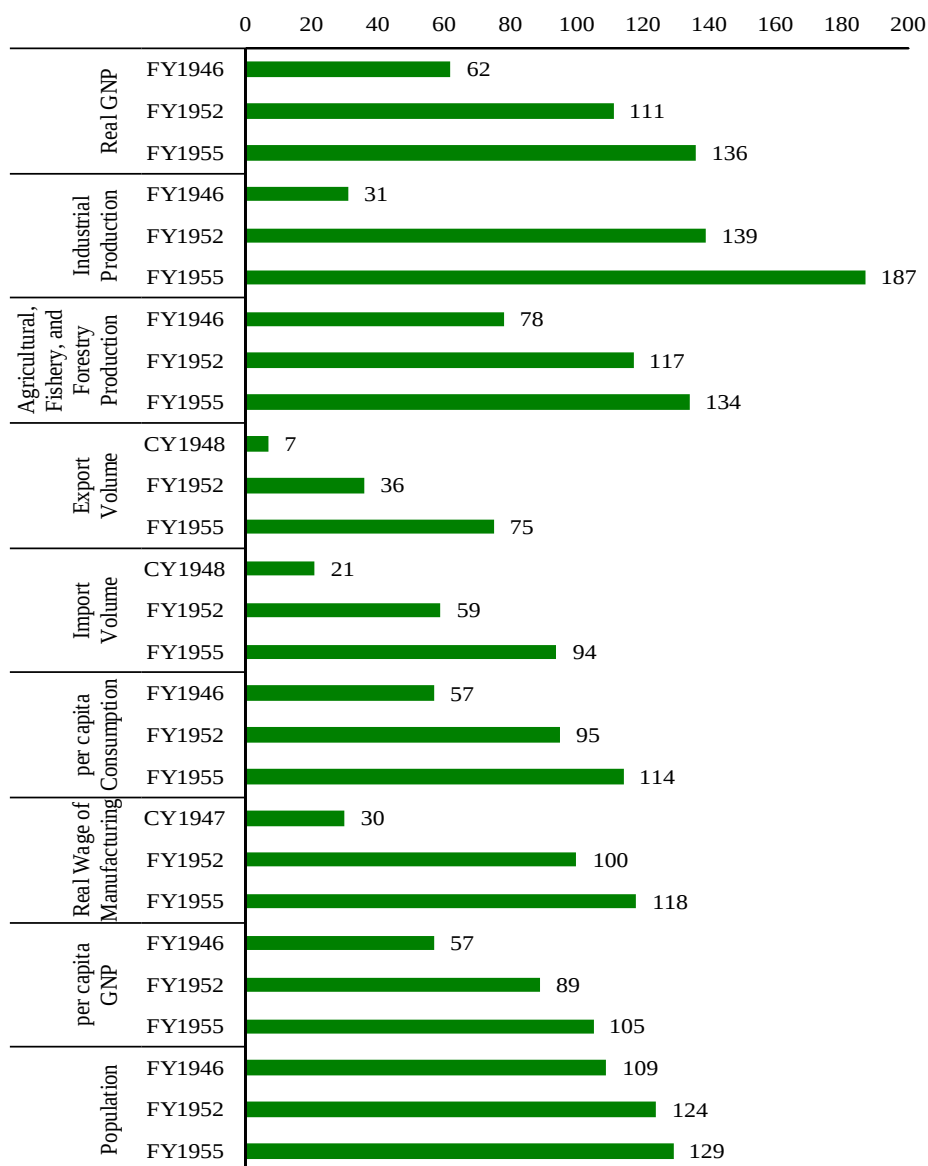
¹⁰ This independent demand, of course, might have brought some Keynesian multiplier.

Table 3-1: Special Procurement Order (unit: US\$1,000)

	Merchandise	Services	Total
1950.6-51.5	229,995	98,927	328,922
1951.6-52.5	235,851	79,767	315,618
1952.6-53.5	305,543	186,785	492,328
1953.6-54.5	124,700	170,910	296,610
1954.6-55.5	78,516	107,740	186,256
total	974,607	644,129	1,618,736

Source: Miwa and Hara (2010) p.149.

Figure 3-3: Postwar Economic Activities Until 1955 (Unit: 1934-36=100)



Source: EPA (1976) p.86.

Note: “CY” means calendar year while “FY” means fiscal year (see footnote 2).

4. Historical Overview of Japanese Economic Plans High-Growth Period in 1950s and 1960s

In September 1951, the Peace Treaty of San Francisco was signed and Japan recovered its independence with the effectuation of the Treaty in April 1952. Under the GHQ regime, Mr. Dodge reported that Japan’s economy had been standing on stilts of aids and subsidies when getting to Japan but the Japanese government had to self-support its economy independently after the effectuation of the Treaty. Economic Plans had been playing a great role for economic policy coordination under the free market system. Because of this reason and others, the Economic Council Agency (ECA) was founded in August 1952 according to the government reorganization with the parent body of the Economic Stabilization Agency (ESA) and took charge of economic plan formulation and other economic policy coordination functions. EPA (1976) places that the Economic Council Agency mainly took in commission of the formulation of economic plans, the general coordination of policies relating to the economy, and the objective and neutral research and analysis on both domestic and foreign economies. Around the founded time, the characters and operation policies were as follows according to EPA (1997):

- (1) Main commissions of the ECA are formulation of general economic policies, coordination of economic policies among Ministries and Agencies of the government, and research and analysis on the current economic situation;
- (2) The ECA formulates economic plans and economic policies that are based on research and analysis on the current economic situation;
- (3) The ECA provides basis for drawing up the economic policies, formulating long-term economic forecasts like the Economic Restructuring Program, Self-Standing Economy Plan, and so on, which the Economic Stabilization Agency had plotted out;
- (4) The ECA plans general economic policies from the comprehensive viewpoint of fiscal, monetary, industrial, and trade policies; and
- (5) Other than above-mentioned, the ECA is in charge of electric power development and national development plans.

Table 4-1: Economic Plans in Japan

Name		Five-Year Plan for Economic Self-Support	New Long-Range Economic Plan	National Income Doubling Plan	Medium-Term Economic Plan	Economic and Social Development Plan	New Economic and Social Development Plan
Formulation data		December 1955	December 1957	December 1960	January 1965	March 1967	May 1970
Period		FY 1956-60	FY 1958-62	FY 1961-70	FY 1964-68	FY 1967-71	FY 1970-75
Methodology of estimates		Colm approach	Alternative growth rates approach	Alternative growth rates approach	Econometric model approach	Econometric model approach	Econometric model approach
Purpose		Self-support of the economy	Maximization of growth	Maximization of growth	Correction of the distortion	Development to balanced and fulfilling economy and society	Building comfortable Japan with balanced economic development
		Full employment	Improvement of national life	Improvement of national life			
			Full employment	Full employment			
GDP/GNP Growth Rate	(planned)	5.0%	6.5%	7.2%	8.1%	8.2%	10.6%
	(actual)	8.7%	9.9%	10.7%	10.6%	10.9%	6.1%
Industrial Growth Rate	(planned)	7.4%	8.2%	10.5%	9.9%	10.2%	12.4%
	(actual)	15.6%	13.5%	13.8%	13.6%	13.2%	3.6%
Inflation of Consumer Prices	(planned)	n.a.	n.a.	n.a.	2.5%	approx. 3%	4.4%
	(actual)	2.0%	3.5%	5.7%	5.0%	5.7%	10.9%
Balance of Payment at the final year	(planned)	\$ 0 million	\$ 150 million	\$ 180 million	\$ 0 million	\$ 1450 million	\$ 3500 million
	(actual)	\$ -10 million	\$ -20 million	\$ 2,360 million	\$ 1470 million	\$ 6320 million	\$ 130 million

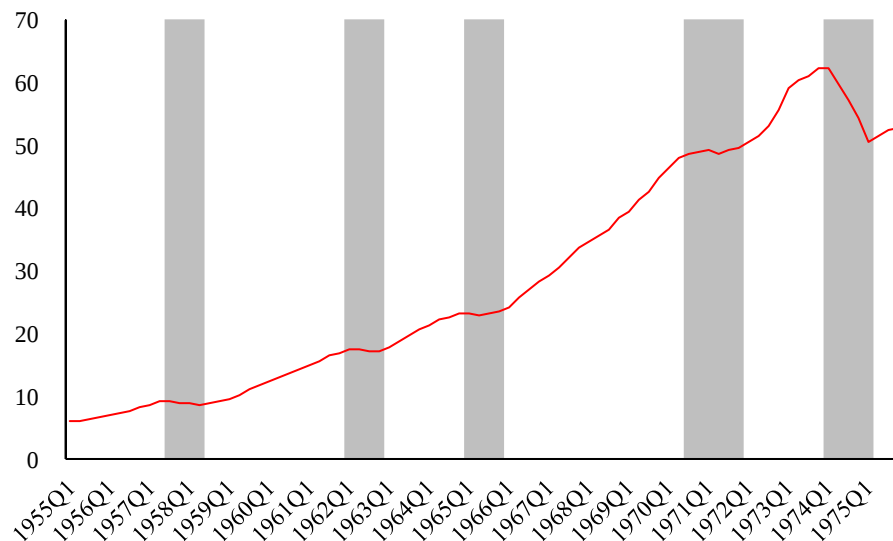
Source: Authors based on EPA (1997) pp.45-46 and Haruta (1980) pp.279-80.

In short, the Economic Council Agency was founded as an affiliated government entity with the direction of a Minister of State and consisted of three divisions of Coordination, Planning, and Research other than administrative section. The Economic Council was also founded as an affiliated organization of the ECA mainly to deliberate on important economic policies and plans¹¹. Moreover, in July 1955, the Economic Planning Agency (EPA) was founded with the reorganization of the Economic Council Agency. The Development division, in charge of comprehensive national development plans, was added to the EPA, separated from the Planning division. And finally, the EPA was reorganized into the Cabinet Office according to the government reorganization in January of 2001. In high-growth period in postwar Japan, the Economic Planning Agency played a strong role in economic policy coordination and economic plans, as highlighted below:

- (1) Five-Year Plan for Economic Self-Support (FY1956-60);
- (2) New Long-Range Economic Plan (FY1958-62);
- (3) National Income Doubling Plan (FY1961-70);
- (4) Medium-Term Economic Plan (FY1964-68);
- (5) Economic and Social Development Plan (FY1967-71); and
- (6) New Economic and Social Development Plan (FY1970-75).

EPA (1997) and Haruta (1980) summarize the above-listed Economic Plans as former Table 4-1.

Figure 4-1: Business Cycle and Index of Industrial Production (IIP) in Postwar Japan



Note: (1) Shaded durations indicate those of recession.
 (2) Unit of IIP is year 2010=100.

¹¹ The Economic Council advised government entities, and consisted of business leaders, academic authorities, consumer representatives, and so on, and played a significant role in formulating Economic Plans, because the Prime Minister issued a consultative document to the Council and the Cabinet decided the Economic Plan in line with the submitted report by the Council. We'll focus further on the Economic Council in Chapter 10.

Source: Cabinet Office and Ministry of Economy, Trade and Industry.

Japan underwent several recessions in the postwar high-growth period of the 1950s-60s. Figure 4-1 shows the development of Index of Industrial Production (IIP), which had been assumed considerably coincident with the business cycle along with shadowed recession period. Furthermore, during this period, worsening the balance of payment triggered the hike of interest rate that led the turning point of the business cycle¹². This sort of background information on business cycle¹³ is useful for understanding Economic Plans in Japan.

4.1 Five-Year Plan for Economic Self-Support (FY1956-60)

A lot of economists and historians regard the Five-Year Plan for Economic Self-Support decided by the cabinet in December 1955 as the first full-fledged economic plan in postwar Japan, mainly from the viewpoint of the determination procedure and the estimation methodology. The formulation procedure was as follows: (1) The Prime Minister issued a consultative document to the Economic Council; (2) The Economic Council, consisting of business executives, academic authorities, consumer representatives, labor union leaders, and so on, discussed the theme to complete a report; and (3) the Cabinet decided the economic plan in line with the submitted report by the Economic Council. The succeeding economic plans after this Plan assimilated this formulation procedure between the Cabinet and the Economic Council.

The planning period of this Plan was for five years from FY1956 to FY1960. The main purposes of this Plan were set for the following two points: (1) Expanding equilibrium of balance of payment with no dependence on US assistance or special procurement caused by the Korean War; and (2) Achievement of full employment of a rapidly expanding labor force. Before this Plan, the concrete task to formulate economic policy started from aggregating and accumulating individual goods and services at a microeconomic level. This plan, however, had put the basis on future estimation of national macroeconomic activity level represented by the GNP/GDP. This change in estimation methodology was another reason that this Plan was regarded as the first full-fledged economic plan. Thus, the following three steps were adopted: First, the size of the national output required for full employment from labor force and labor productivity, i.e., *per capita* output, was estimated; second, this estimated size of national output was checked whether it would be completed consistently with macroeconomic self-support and stability; and third, the consistency of macroeconomic development and growth path was verified with individual economic sectors. And finally, the real growth rate was

¹² This point is our focus in Chapter 13. And CAO (2007) p.162 Column 3-2, titled “Ceiling of the Balance of Payment” also takes a look back on some features of the business cycle during the high growth period.

¹³ More detailed information on Japanese business cycle is provided at the Cabinet Office web site of <http://www.esri.cao.go.jp/en/stat/di/di2e.html> (accessed on June 30, 2016).

set at around five percent within the planned period employing the Colm method as the estimation methodology¹⁴.

This Plan revealed the intention of the government policy and the direction of private business activities describing an estimated future economy under the free market system and pointed out the following ten fields of importance for implementing the Plan according to EPA (1976):

- (1) Enhancement of industrial basis (emphasis on streamlining and principle of investment priority);
- (2) Promotion of international trade (harmonization to trade liberalization and upgrading of trade structure);
- (3) Improvement of self-sufficiency rate and reduction of foreign exchange expense;
- (4) Promotion of national land preservation and development;
- (5) Stimulation of science and technology;
- (6) Development of small and medium-sized business;
- (7) Increase of employment and fulfilling social security system;
- (8) Adherence to principle of balanced budget and normalization of financial conditions;
- (9) Stabilization of prices (including distribution rationalization); and
- (10) Stabilization of national life and saving adequate consumption.

This Plan stood at the tipping point of high-growth period in postwar Japan and, for two years, the real economy had actually overachieved the Plan. This rapid macroeconomic expansion contributed actively to a self-supporting economy but the overheated economy brought the exacerbation of the balance of payment at the same time. After two years of implementation, the New Long-Range Economic Plan had succeeded to the Five-Year Plan for Economic Self-Support.

4.2 New Long-Range Economic Plan (FY1958-62)

As the first full-fledged economic plan, the Five-Year Plan for Economic Self-Support implemented in FY1955 had completed its mission for two years in FY1957 and the New Long-Range Economic Plan had succeeded. The EPA (1997, pp.99-102) points out four types of economic plans in postwar Japan: (1) Targeting reconstruction and self-support from war damages; (2) Placing priority on achieving maximization growth; (3) Aiming at harmonization between growth and development; and (4) Guiding moderate growth. While the goal of the Five-Year Plan for Economic Self-Support seemed categorized for the first purpose in general, the targets of the New Long-Range Economic Plan and the succeeding National Income Doubling Plan were close to the second.

¹⁴ We focus on the methodologies of estimation in Chapter 11.

Implementing the Five-Year Plan for Economic Self-Support, the Japanese economy had been growing rapidly. For example, the real growth rate of national income soared to 13.9 percent (EPA 1972, p.106) in FY1956, and vastly exceeded the planned 6.5 percent of GDP growth. A lot of economists pointed out the boom in 1955 had been led by exports and then in 1956 by investments. This rapid growth caused, however, some bottle-necks were recognized in economic activities. Among those, following four points were regarded very profound: (1) Backlog of machinery orders; (2) Credit crunch and expansion of overloan; (3) Accelerating inflation; and finally, (4) Deficit in balance of payment. According to EPA (1972, pp.108-09), in July 1956, balance of payment turned to deficit. Afterward, imports increased rapidly, for example, EPA (1976, p.110) reveals that imports expanded by around 80 percent *per annum* from summer 1956 to spring 1957, and foreign currency reserves declined from \$941 million at the end of 1956 to \$455 million. In mid-1956, the economic policy stance had turned toward a tightening direction, which had terminated the boom. According to these circumstances, in April 1957, the Economic Council discussed and agreed following five points¹⁵:

- (1) The Five-Year Plan for Economic Self-Support was out of date, to be aborted in FY1957 and a new economic plan should be formulated to replace it;
- (2) The purpose of a new economic plan would be set at maximizing growth rate within economic stability and balance to achieve full employment and to improve national life;
- (3) A new economic plan would be a five-year plan, starting in FY1958 and ending in FY 1962;
- (4) A new economic plan would mainly utilize indirect policy measures, including fiscal policy, monetary policy, exchange rate policy, and so on, and partly, tax policy, fiscal investment and loans, subsidies and grants, interest subsidies, antitrust policy, social security, minimum wage, and so on, as would be applicable in general and cooperative ways; and
- (5) Priority sectors were subject to basic comprehensive economic management but the scope would be flexible and not limited to bottleneck sectors.

After a long discussion at the Economic Council, the New Long-Range Economic Plan was decided at the Cabinet in December 1957 and implemented in FY1958. The report of the Economic Council stressed three important points of the new Plan: 1) increase in employment to absorb both labor force entrants and those inadequately employed at agriculture and/or small businesses, 2) resolution of bottlenecks and consistent expansion of basic sectors including transportation and energy, etc., and 3) prevention of economic fluctuation within the context of a desirable and stable future path for the Japanese economy.

¹⁵ Asai (2000)

4.3 National Income Doubling Plan (FY1961-70)

The National Income Doubling Plan was one of the most famous and epoch-making economic policies during the high-growth period in postwar Japan. This Plan was formulated directly because of the inauguration of Prime Minister Ikeda, who insisted on so-called “Monthly Salary Doubling Policy” under the situation of higher economic growth than planned in the former Plan; the target of the GNP/GDP level was to be realized in just three years, not the planned five years. The National Income Doubling Plan thus sought to maximize growth; target growth rates were set at 9 percent for the first three years of the Plan and 7.2 percent for the rest seven years. Other targets and goals were coordinated consistently with this high growth rate¹⁶.

Other than seeking high growth, EPA (1976) points out that the National Income Doubling Plan was designed to assure the performance of policy implementation in the following four fields:

- (1) Important targets were set at the public sectors, including infrastructure building, improvement of social security and welfare, and so on, for which the government had direct or strong measures to implement;
- (2) Inclusion of human resources development to boost the potential abilities of people dealing with education, job training, science and technologies, and so on;
- (3) Attention to inequality among people, not concentrating only on the macroeconomic average situation; and
- (4) Focus on regional development, which resulted in the Comprehensive Development Plan formulated later in 1962.

Table 4-2 shows a comparison between planned and actual figures during the National Income Doubling Plan.

¹⁶ Takeda (2014) provides some informal information about this coordination.

Table 4-2: Comparison Between Planned and Actual During National Income Doubling Plan

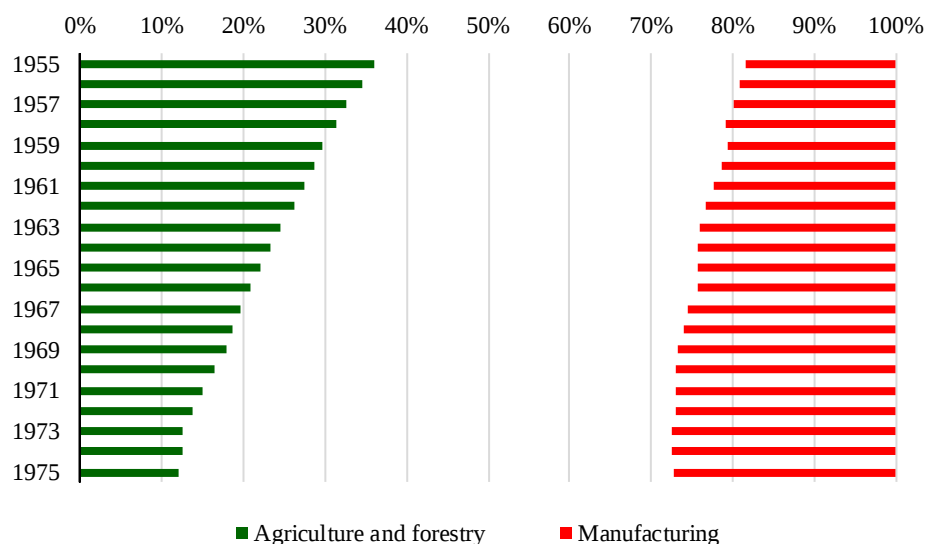
	Planned		Actual	
	Target Level in FY1970	<i>per annum</i> growth rate (%)	Actual Level in FY1970	<i>per annum</i> growth rate (%)
Population (thousand)	102,220	0.9%	103,720	1.0%
Number of persons engaged (thousand)	48,690	1.2%	50,940	1.5%
Number of persons employed (thousand)	32,350	4.1%	33,060	4.3%
GNP (FY1958 prices, yen, billion)	26,000.0	7.8%	40,581.2	11.6%
National income (FY1958 prices, yen billion)	21,323.2	6.9%	31,767.8	10.4%
Per capita national income (FY 1958 prices, yen)	208,601	6.9%	317,678	10.4%
Private consumption (FY1958 prices, yen billion)	15,116.6	7.6%	20,786.3	10.3%
Per capita private consumption (FY1959 prices, yen)	147,883	6.7%	204,079	9.4%
Share of the primary sector at national income	10.1%	n.a.	7.4%	n.a.
Share of the secondary sector at national income	38.6%	n.a.	38.5%	n.a.
Share of the tertiary sector at national income	51.3%	n.a.	54.1%	n.a.
Industrial production (FY1958=100)	431.7	11.9%	539.4	13.9%
Agricultural, fishery, and forestry production (FY1958=101)	144.1	2.8%	130.3	2.1%
Domestic cargo transport (ton kilo, billion)	97.5	6.9%	343.8	10.2%
Domestic passenger transport (person kilo billion)	210.9	7.6%	588.9	8.3%
Energy Demand (thousand ton equivalent to coal)	302,760	7.8%	574,095	12.0%
Exports (custom basis) (dollar billion)	9.32	10.0%	20.25	16.8%
Imports (custom basis) (dollar billion)	9.89	9.3%	19.53	15.5%

Source: EPA (1976) p.137 with some correction by the authors.

One of the most remarkable features of the National Income Doubling Plan was to include a comprehensive strategy for modernizing Japanese agriculture and industry. The Plan assumed that labor productivity across the primary, the secondary, and the tertiary industries would be growing at an almost equal speed, i.e., the productivity growth rate was assumed at 5.6 percent at the primary sector, 5.5 percent at the secondary sector, and 5.5 percent at the tertiary sector. This assumption strongly implied that the labor force would migrate from a low-productivity sector to a high sector. According to this concept, the percentage of people in the agricultural population¹⁷ would decline from 36 percent in 1960 of beginning year of the Plan to around 25 percent in 1970 of the end year. Figure 4-2 reports the share of the labor force in agriculture and forestry and manufacturing. Another target is due to the change in consumption and is to reduce the proportion of starchy foods and to increase that of stock farm products, fruits, and so on. On the other hand, the manufacturing sector was expected to strengthen international competitiveness, and the following targets were listed¹⁸:

- (1) Expansion of firm scale;
- (2) Strengthening of measures against recession;
- (3) Cooperation between big business and medium- and small-sized companies; and
- (4) Maintenance of order at procurement of imported raw materials and foreign resources.

Figure 4-2: Share of Labor Force in Agriculture and Forestry and Manufacturing



Source: Authors calculation based on Statistical Bureau of Japan.

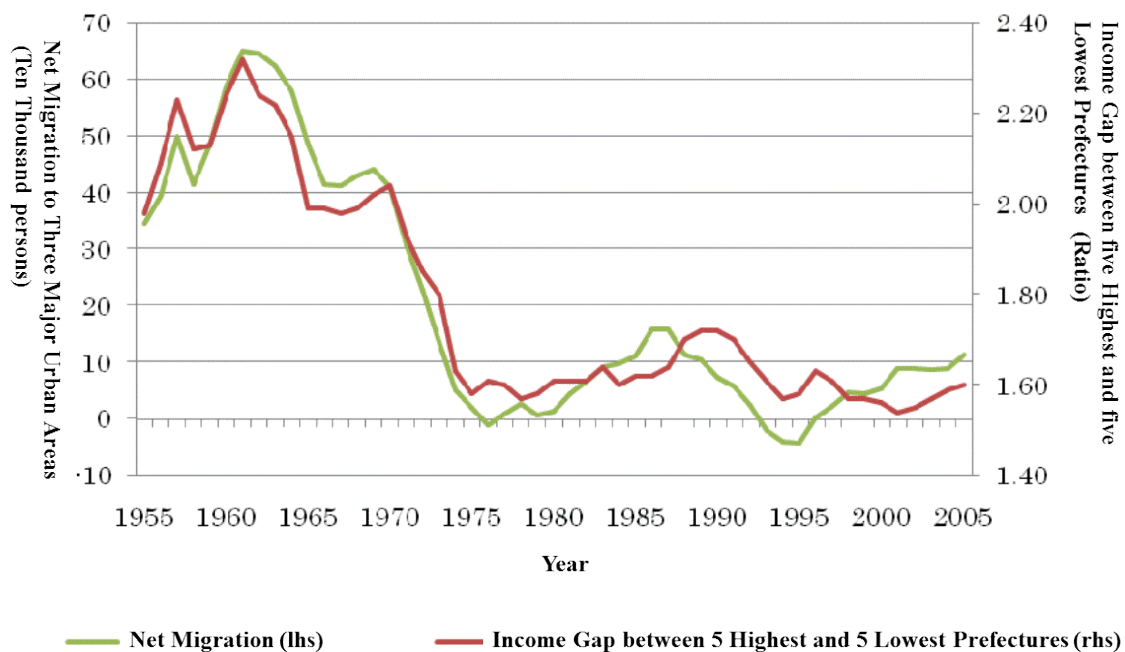
This labor shift among industries also resulted in a large population migration to urban areas,

¹⁷ Here, “agricultural population” was included both farmers and their dependent household persons, i.e., was defined as the sum of labor force engaged in agriculture and their families. According to the Statistical Bureau of Japan, the proportion of the labor force engaged in agriculture and forestry was 28.7 percent in 1960, which implies that the number of farm families was larger than that of the rest.

¹⁸ The Ministry of International Trade and Industry (MITI) was at the National Income Doubling Plan in charge of industrial policy to complete this purpose.

including greater Tokyo, greater Osaka, and greater Nagoya. And this labor migration contributed not only to high economic growth in postwar Japan but also to the reduction of the regional income gap, since it was caused by differences in productivity among industrial sectors/areas. Labor/population migrated from industrial sectors/areas of low productivity to those of high productivity, which raised Japan’s entire productivity and brought high growth. Figure 4-3 depicts the correlation between the net population migration to the three major urban areas (greater Tokyo, greater Osaka, and greater Nagoya) and the gap of *per capita* income in each prefectural area, which shows that the income gap decreases/increases according to the movement of the population migration.

Figure 4-3: Net Population Migration to the Three Major Urban Areas and Gap of Per Capita Income



Source: Nawata (2008) p.20 Figure 5.

The National Income Doubling Plan also stressed the importance of increasing industrial locations, accompanied by an increase of manufacturing output. Since industrial production would be assumed to play a key role for doubling the national income, and to gain by 3.3 times from 1960 to 1970, the infrastructure building including land and water procurement, construction and maintenance of transport facilities such as roads, ports, bridges, airports, etc., and so on. And it was pointed out that it was profoundly important for the government to show leading and indicative guidelines for allocation of manufacturing sites of private firms with respect for their free activities. Finally, the Plan stated that the Pacific Belt Zone was regarded as the center of manufacturing allocation consistent with the Plan since it linked the big four existing manufacturing areas (Tokyo, Nagoya, Osaka, and Kita-Kyushu). But at the same time, the Plan emphasized the significance of reducing the regional gap in

manufacturing development and economic growth¹⁹.

4.4 Medium-Term Economic Plan (FY1964-68)

A few years later after executing the National Income Doubling Plan, while economic performance on average was satisfactory, some problems of economic inequalities arose. For example, economic development was characterized by both consumption and investment aspects; the former was found out in the rapid spread of durable consumer goods, including some electric appliances, and the latter was revealed in expanding increased investment, which was called investments-induce-another-investments²⁰. Table 4-3 shows the diffusion rate of durable consumer goods in urban and farm families.

Table 4-3: Diffusion Rate of Durable Consumer Goods

		1957.9	1958.9	1959.9	1960.8	1961.8	1964.8
Television Set	urban family	7.8%	15.9%	33.5%	54.5%	71.9%	93.5%
	farm family	n.a.	2.6%	4.3%	11.4%	28.5%	81.7%
Washing Machine	urban family	20.2%	29.3%	36.7%	45.4%	55.0%	75.8%
	farm family	n.a.	5.2%	6.8%	8.7%	14.5%	47.0%
Electric Refrigerator	urban family	2.8%	5.5%	9.7%	15.7%	26.6%	66.2%
	farm family	n.a.	n.a.	n.a.	1.3%	2.5%	14.5%
Camera	urban family	35.7%	43.1%	44.3%	47.2%	50.8%	61.8%
	farm family	n.a.	15.9%	17.3%	16.0%	18.0%	23.9%

Source: EPA (1976) p.115.

On the other hand, the United Nations completed a meta-survey on social development plans in member countries and revealed its results in 1960 that following ten categories were mainly focused on all over the world²¹:

- (1) Health planning;
- (2) Nutrition Planning;
- (3) Housing and environmental planning;
- (4) Consumer supporting planning;
- (5) Education planning;
- (6) Labor planning;

¹⁹ The Comprehensive National Development Plan, first formulated in 1962, succeeded the concept in this context. See chapter eight for more detailed information.

²⁰ The investments-induce-another-investments effects were analyzed in the Economic White Paper of EPA (1962); chapter thirteen deals with this sort of economic analysis.

²¹ Hoshino (2003) p.455.

- (7) Social security planning;
- (8) Social insurance and rehabilitative planning;
- (9) Agriculture planning; and
- (10) Refugee protection and support planning.

Considering these domestic and international movements, the government of Japan decided to abolish the National Income Doubling Plan and formulated a new economic plan entitled the Medium-Term Economic Plan, which stated the importance of social development in the following two points:

- (1) It is required to speed up social development, more rapidly than economic development, which corresponds to balanced development. Especially in Japan, social development is of serious importance, including correcting distortions and resolving the dual structure, from the viewpoint of the approach to the developed countries; and
- (2) When the Japanese economy gets to the scope of developed countries from the viewpoint of *per capita* national income and/or modernization of industrial structures, etc., the remaining nationwide gap or disparity would not be acceptable as the developed countries with the delay of social development from the viewpoint of national life.

4.5 Economic and Social Development Plan (FY1967-71)

The year 1964 was significantly epoch-making for postwar Japan. First, the capital city of Japan, Tokyo, hosted the Olympic Games for the first time in Asia. Also, for the preparation of the Olympic Games, secondly, some traffic infrastructures were built, including the Shinkansen bullet train, the Metropolitan Expressway, and other expressways. In the international economic context, Japan completed the transition to Article 8 nation of the IMF in 1964²², which implies that it would be prohibited to control foreign exchange as an excuse for the balance of payments. With these results, Japan joined the OECD. After 20 years from the end of the war, Japan was on its way back to reintegration into the world economy.

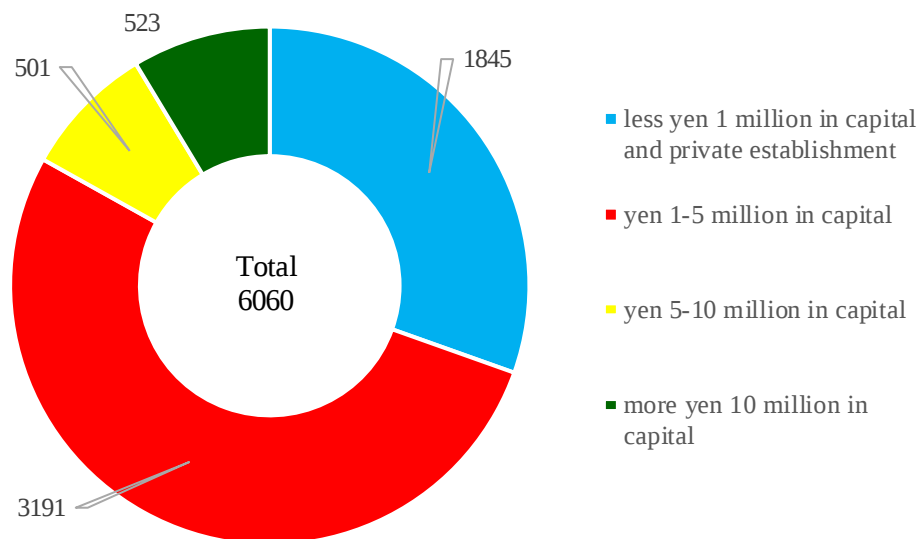
After hosting the Olympic Games, Japan experienced the first full-blown recession in postwar in 1965. According to the business cycle dating identified by the Cabinet Office, the 1965 recession began after October 1964 as the peak and ended in October 1965 as the trough for 12 months. Before this 1965 recession, postwar Japan had experienced several recessions, but the character of these recessions mainly appeared short-term, and the cyclical phenomena was caused by investment in inventory. In addition of this short-term and cyclical character, Toshida (2001, p.108) stresses that the

²² After the Peace Treaty of San Francisco in 1951, Japan joined the IMF and IBRD in 1952. And Japan transitioned to Article 11 nation of the GATT in 1963, which implies that it would not be permitted to restrict imports as an excuse for the balance of payments. Japan joined the GATT in 1955. See chapter 7 for more detailed information.

feature of the 1965 recession was combined causality that were medium-term phenomenon caused by the equipment investment and the failure of coordination at the transit from an excess labor economy to a labor shortage economy²³. Apart from short-term and cyclical character, those causal factors brought the following three features:

- (1) A boost for demand by fiscal policy was required since easing of monetary policy was inadequate for recovery;
- (2) Compared with economic decline, damages among small- and medium-sized firms, including bankruptcies, credit crunches, and business slumps, were profoundly severe (see Figure 4-4); and
- (3) Price inflation even under recession did not decline.

Figure 4-4: Bankruptcy in FY 1965 Classified with Capital



Source: Toshida (2001) p.107.

Under these changes in circumstances²⁴, the government of Japan decided a new economic plan, entitled the Economic and Social Development Plan, in 1967 for the purpose of creating a well-balanced and fulfilling development in economy and society along with affluent national life, management reconstruction, and modernization in low-productivity sectors, placing emphasis on the quality of the Japanese economy that had previously remained incomplete. According to this concept, the Plan stressed following three points:

- (1) The realization of economic efficiency is to be pursued with optimal allocation of labor and capital to improve international competitiveness and to reduce the disparity among

²³ Also see Figure 4-2.

²⁴ The Economic and Social Development Plan stressed the importance of the process of urbanization in addition to the above-mentioned internationalization in economy and society and earnest labor shortage.

industries by growing productivity in low productivity sectors, including agriculture, distribution, small- and medium-sized business, and so on;

(2) The stability of prices is basic for affluent national life and economic health, and a dual-sided price policy is to be carried out that includes short-term price stability to depress extraordinary inflation and a long-term, structural, and essential price stability to improve economic efficiency; and

(3) The top priority is on social development, to achieve a welfare state with promotion of regional development, amplification of social security, improvement of education, etc.

Unofficially, Hoshino (2003, p.356) points out that one of the biggest causes to demolish the Medium-Term Economic Plan only in one year and half and to formulate the Economic and Social Development Plan is the difference of inflation rate between the planned and the actual. For example, the annual inflation rate was forecasted around 2.5 percent at the Medium-Term Economic Plan but in fact the inflation rate rose up to 4.8 percent in FY1964, and 7.4 percent in FY1965. Also it is stressed that the Medium-Term Economic Plan had not included price policy while its successor regarded it as one of the most important three policies. And among above-mentioned important three points, from the organizational viewpoints, the affluent national life had been supported by founding the National Life Bureau that held jurisdiction over price stabilization policy in the Economic Planning Agency in June 1965.

4.6 New Economic and Social Development Plan (FY1970-75)

Passing over three years after implementation of the Economic and Social Development Plan, the New Economic and Social Development Plan had replaced it in May in line with the basic direction of the Economic and Social Development Plan, taking particular note of the following change of circumstances:

(1) Japan had occupied the position of the second-largest GNP/GDP country in the capitalist world following the United States; its rise in international status had required more commitment to international cooperation in resolving international currency issues, ODA promotion, contributions to a prosperous world economy, and so on;

(2) Japanese economy and society had been very dense; for example, industrial production had reached a huge level, so that high-speed traffic and communications networks would be required to achieve the full development all over Japan along with international networks; and

(3) According to the changing labor and social conditions, the improvement of labor quality would be strongly required, commensurate with upgraded production processes and social activities.

Continuously from the previous Economic and Social Development Plan, the New Economic and

Social Development Plan also focused on national life and price policy. The New Economic and Social Development Plan set the target of eight percent growth and three percent inflation. A medium-term macroeconomic model²⁵ was employed for forecasting the economic conditions and some simulation results were revealed by the Econometric Committee of the Economic Council, mainly for the purpose of consensus building.

In the first half of the 1970s, the postwar world economy, including Japan, reached the end of the golden age of the Bretton-Woods regime, which was characterized by the fixed exchange rate and free trade system under GATT-IMF surveillance. In August 1971, the United States decided to suspend the exchange between gold and the dollar, and, later in December 1971, the yen appreciated from yen 360 to 308 against the dollar. Later, in early 1973, developed countries began to float their currencies, including the yen. Another external shock hit the world economy, i.e., the first oil crisis triggered by the fourth Middle East War (Yom Kippur War) resulting in price hikes and reduced supply of oil all over the world. Because of this oil crisis, the Japanese economy went into the triple difficulty of inflation, recession, and external deficit. Many economists agree that the high-growth period in postwar Japan ended sometime in the first half of the 1970s²⁶.

5. Fiscal and Financial System During High-Growth Period

To achieve high economic growth, high capital accumulation is required. High savings are required to sustain investments, and there must be a financial system to connect high savings to high capital accumulation in an efficient way. Furthermore, the government must be supported by a solid fiscal base to play an effective role. In this chapter, we glance at the Japanese experience and its fiscal and financial systems.

5.1 Fiscal System

(Small Government and Balanced Budget Principle)

Sadahiro (1991) states that “Small Government” was the key characteristics in Japanese public finance during the high growth period. As denoted in Table 5-1, the tax burden ratio had been kept at less than 20 per cent throughout the period of high economic growth²⁷. Tax reductions were implemented every year because the tax elasticity to income exceeded unity due to progressive taxation on personal income. The level of social security was low owing to the young population

²⁵ An econometric model was first employed at the formulation process of the Medium-Term Economic Plan (FY1964-68) and a constant effort to improve it was exerted at the Economic Planning Agency. Detailed information is provided in Chapter 11 in this study.

²⁶ Some studies stress that these external shocks forced the high-growth period to terminate while Harada and Yoshioka (2004) highlight the importance of the internal factor of labor migration.

²⁷ The Government Tax Commission submitted this guideline in 1960.

structure at that time. It was not until the mid-1970s that the conflict between social security and small government surfaced. High growth, low burden, and young population produced a favorable environment for savings.

Table 5-1: Government Size (%)

	1955	1960	1965	1970	1975	1980
Tax Revenues / NI	19.2	19.2	18.4	19.3	18.9	22.8
Social Security Contribution / NI	3.3	3.6	5.0	5.4	7.5	9.1
Social Security Transfer / NI	5.4	4.5	5.9	5.8	9.5	12.5
Public Expenditures / GDP	18.0	15.2	17.2	15.6	19.3	19.3
General Account Budget / GDP	11.8	10.4	11.0	10.9	13.7	17.7
FILP / GDP	3.5	3.7	5.3	5.0	6.9	7.4
FILP / General Account Budget	29.2	35.9	47.7	46.4	50.6	41.7

Source: Economic Planning Agency and Ministry of Finance.

Note: NI = National Income (at factor cost), FILP = Fiscal Investment and Loan Program.

After the Dodge stabilization policy in 1949, the government had kept the balanced budget principle until 1965 without dependence on government bonds. Though deficit-financing government bonds for financing the deficits of current accounts were issued in 1965, thereafter until 1973, deficit-financing bonds had never been issued, and only construction government bonds for financing the deficit of capital accounts were issued to perform sound fiscal management.

In spite of the balanced budget principle with low tax burden, high economic growth automatically yielded an increase in revenues, which enabled the government to steadily expand expenditures. The government gave more weight to the investment category than to the non-investment category, such as wages of public officers, defense spending, and subsidies.

(Fiscal Investment and Loan Program)

The Fiscal Investment and Loan Program (FILP), which was often called the second national budget, played a significant role in tying social savings to social investments. As shown in Table 5-2, the financial resources of the FILP mainly came from accumulated funds of the public pension scheme, from postal savings, and from postal life insurance. Postal savings were funds absorbed from the people by the government itself as a bank activity. Post offices were located across the country and contributed to the saving mobilization of the households by occupying a considerable weight in Japanese financial institutions. The scale of the FILP had expanded 300 billion yen in 1955 (approximately 30% of the general account budget) to 10 trillion yen in 1975 (50% of the same).

Table 5-2: Fiscal Investment and Loan Program by Sources and Uses (%)

	1955	1960	1965	1970	1975	1980
Sources						
Special Account	17.1	4.3	3.4	2.9	0.7	0.1
Trust Fund Bureau Fund	52.3	56.3	65.6	71.1	84.4	84.1
- Postal Savings	34.2	21.4	23.4	31.6	41.6	38.2
- Pension Fund	9.6	12.7	23.2	25.8	21.6	16.0
- Collection, etc.	8.5	22.2	19.0	13.7	21.2	29.9
Postal Life Insurance Fund	15.6	18.9	6.8	11.0	10.8	8.2
Government-guaranteed Bonds	15.0	20.5	24.1	15.1	4.2	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Uses						
Housing	13.8	12.8	13.9	19.3	21.4	26.2
Improvement of Living Environment	7.7	9.3	12.4	11.6	16.7	14.1
Health & Welfare	2.1	1.8	3.6	2.8	3.4	3.5
Education	4.5	3.5	3.1	2.2	2.9	4.4
SMEs	8.1	12.8	12.6	15.4	15.6	18.7
Agriculture & Fishery	8.9	7.1	7.2	5.0	4.1	4.9
sub-total	45.1	47.2	52.8	56.4	64.1	71.8
National Land Conservation	7.7	6.5	3.1	1.6	1.2	1.7
Road	3.7	3.6	7.9	8.6	8.0	5.7
Transportation & Communication	12.2	14.1	13.9	13.2	12.7	9.6
Local Development	8.5	7.1	7.0	4.0	3.3	2.6
sub-total	32.1	31.3	31.9	27.4	25.2	19.6
Key Industries	15.8	13.6	7.8	5.7	3.0	3.0
Trade & Economic Cooperation	7.0	7.9	7.5	10.6	7.7	5.6
sub-total	22.8	21.5	15.3	16.3	10.7	8.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Finance.

Note: Special Account = Industrial Investment Special Account.

The FILP funds were invested through the state’s special accounts, local governments, and public corporations / foundations. Heavy weight was given to loans for such key industries as steel, shipbuilding, and power industries in the 1950s. As time passed, however, the weight of these industries declined, and loans to such living environmental facilities as housing, small and medium-sized businesses, and such infrastructure as roads had increased.

(Tax System)

The tax system of postwar Japan was based on Dr. Shoup’s recommendation in 1949²⁸. Sadahiro

²⁸ Carl Shoup (1902-2000) was a public finance professor from Columbia University. He led the mission to revise the tax system in the postwar Japan.

(1992) summed up that the basic spirit of the Shoup tax system was a comprehensive income tax principle focused on two kinds of equality: vertical and horizontal equality. Although Shoup did not allow preferential tax measures, it was partly amended to stimulate investment and savings through the introduction of special depreciation measures, abolition of the capital gains tax, cut in property income tax rate (all of them in 1953), and preferential taxation on interest income.

Table 5-3: Tax Decreases by Preferential Measures (billion yen)

	1950	1955	1960	1965	1970	1975
Savings promotion	0.3	27.4	51.0	136.3	186.4	271.0
Capital accumulation (non-taxable reserves)	0.5	39.2	50.3	35.5	19.4	89.0
Modernize equipment & machinery (special depreciation)		2.8	14.0	21.0	53.5	111.0
Industry promotion etc.*	0.5	12.8	26.5	26.5	153.4	186.0
Other		11.2	-1.1	-7.6	-28.6	-96.0
Total tax decrease (A)	1.3	93.4	140.7	211.7	384.1	561.0
Total tax revenues (B)	444.6	774.8	1,336.6	3,287.7	6,938.4	17,340.0
A / B ×100 (%)	0.3	12.1	10.5	6.4	5.5	3.2

Source: Nishimura (1994) p.200.

Note: * Figures of 1970 and 1975 included regional development, social development, resource exploitation, and export promotion.

Table 5-3 shows the amounts of tax decreases by preferential measures. While measures to support investments from the side of industries and enterprises had been dominant until the early 1960s, the largest decrease since the mid-1960s was a measure to promote savings, that is, to provide a tax break on interest income, contributions toward private life insurance, and so on. The so-called “Maru-Yu” was a tax-free small-sum savings system was introduced in 1963 and continued until 1987. Tax measures were reviewed (obsolete items were abolished and new items were added) every year in parallel with the budget-making process.

5-2. Financial System

Japan’s financial system during the high growth period had several characteristics: (1) indirect financing and segmented financial institutions, (2) indirect control over credit allocation and interest rate regulations, and (3) the main bank system²⁹.

(Indirect financing and segmented financial institutions)

Flow of funds was dominated by indirect financing. Bank deposits and lending were key instruments

²⁹ These characteristics were summarized from Sadahiro (1992) and Teranishi (1993).

for channeling investible funds from surplus to deficit sectors of the economy (Table 5-4).

Table 5-4: Share of Uses and Sources of Funds (1966-70) (%)

		Japan	USA	Germany
Uses of Funds, Household sector	Currency	19.0	6.3	6.8
	Deposits	50.7	20.5	60.3
	Insurance	12.7	18.1	16.6
	Securities	14.9	52.6	16.1
Sources of Funds, Corporate sector	Own capital	50.7	64.6	66.7
	Borrowings	42.2	17.3	21.5
	Securities	5.7	18.1	3.4

Source: Bank of Japan (1974) *A Comparison by Economic and Financial Statistics*.

Note: Currency = currency and monetary deposits, Deposits = time and savings deposits.

The financial system at that time was organized according to the principle of a *division of labor* among financial institutions. They were segmented into several groups; city banks operating nationwide, regional banks, cooperative banks (shinkin) specializing in the financing of SMEs, agricultural financing institutions, long-term credit banks established for the special purpose of supplying long-term funds to industries, and so on. There existed various regulations by segments, e.g. the number and location of branches, financial instruments and services. Long-term credit banks³⁰ had an operational segmentation with commercial banks mainly dealing with short-term financing. They had a different fund raising system from commercial banks. While the latter had deposits due within three years as major fund sources, fund sources of the former were bank debentures due over five years. Bank debentures were purchased by commercial banks rather than by households, because commercial banks could borrow from the central bank by offering bank debentures as a collateral. From the view of flow of funds, short-term savings flowed into commercial banks from households as short-term deposits. Then commercial banks converted them into long-term funds, and lastly long-term credit banks provided long-term funds to non-financial enterprises.

This segmented financial system was complemented by public financial institutions. As explained above, post offices around the country functioned as fund-raising institutions and government financial institutions as credit suppliers, including two banks and nine public corporations³¹. They provided credit to the private sector under the FILP system at lower interest rates than private banks did. Loans from the World Bank to private enterprises (electricity and steel companies) were intermediated by the

³⁰ The Industrial Bank of Japan (IBJ) was a leading player in three long-term credit banks. While the IBJ was merged with two commercial banks in 2000, other two banks were heavily indebted and temporally nationalized in the late 1990s.

³¹ Two banks were the Japan Development Bank and the Export-Import Bank of Japan. Nine were the Housing Loan Corp., the Small Business Finance Corp. and etc.

Japan Development Bank.

(Indirect control over credit allocation and interest rate regulation)

The monetary policy at that time was characterized by “over-loans” and “low interest rates.”

Despite the strict regulations, the allocation of funds was more or less left at the discretion of commercial banks. This was particularly true for city banks. The allocation of funds by city banks was completely free of regulations and funds raised by the banks through their deposit instruments or the interbank call market were allocated to growing industries. However, a significant source of the base money was the central bank lending to commercial banks. To control the money supply, the Bank of Japan relied on the “window guidance policy,” a kind of credit rationing in the base money market, under the situation of lower official discount rate than money market interest rate (call rate).

Deposit and lending interest rates were regulated. The effectiveness of lending rate controls was doubtful due to the use of practices such as compensating balances to circumvent the regulations. However, controls on deposit rates were considered effective. Deposit rates had been almost fixed during the period of high growth, and were lower than a liberalized money market rate.

(Main bank system)

Among several banks from which a private enterprise borrows, a bank that (i) is the largest lender to the enterprise; (ii) has a long-term commitment; (iii) holds equity; (iv) delegates directors; (v) is involved in comprehensive transactions, such as annuity investments and accounting services, is considered to be the main bank for that enterprise. The role of main bank in these close connection is to produce information on the borrower. It has been argued that the main bank, as a delegated monitor, saves on the costs of information production and also helps in preventing the problem of moral hazard, thereby reducing the agency costs of debt financing.

6. Economic Plan and Industrial Policy

Economists have given a lot of definitions to industrial policy and among those, Kaiduka (1973) defines in short “*the policy that the MITI implements.*” Komiya (1984) describes industrial policy as the policy to create intentionally industrial and trade structure for economic development³², which is close to be called “targeting policy” at present. And these industrial policies were planned and implemented combined with economic plans. For example, Okazaki (1998, table 9) confirms the relationship of some long-term industrial policies with the Five-Year Plan for Economic Self-Support as following Table 6-1:

³² Here, the coordination and/or assistance policies for declining industries are carefully removed.

Table 6-1: Five-Year Plan for Economic Self-Support and Industrial Policy

Electric Power	1956.1	“Electric Power Six-Year Plan” Electric Power Development Coordination Council
Steel	1956.5	“Long-Term Twenty-Year Plan of Supply and Demand of Steel” Ministry of International Trade and Industry
Petrochemistry	1955.7	“Support Measures to Petrochemistry” Ministry of International Trade and Industry
	1956.2	“Handling on Petrochemical Corporatization Plan” Ministry of International Trade and Industry
Synthetic Fabric	1955.6	“Support Measures to Synthetic Resin Industry” Ministry of International Trade and Industry
	1955.8	Foundation of Fiber Industry Council
	1955.9	“Fiber Six-Year Plan” Fiber Industry Council
	1956.2	“Report on Support to Synthetic Fiber” Fiber Industry Council
Machinery	1955.11	Foundation of Machinery Committee at Industrial Rationalization Council
	1956.5	Act on Temporary Measures concerning the Promotion of Machinery Industry
Industrial Location	1956.4	“Comprehensive Measures on Industrial Location” Ministry of International Trade and Industry
	1956.9	Foundation of Conference on Mining and Manufacturing Area Promotion

Source: Okazaki (1998) Table 9.

The National Income Doubling Plan also focused on industrial policy, mainly in Chapter 3 of Part III, entitled “Upgrading of Industrial Structure and Mitigation of Dual Structure,” consisting of the following five subsections:

- (1) Upgrading of manufacturing and strengthening international competitiveness;
- (2) Foundation of rational energy system;
- (3) Modernization of agriculture, forestry, and fishery;
- (4) Modernization of small- and medium-sized firms; and
- (5) Promotion of labor migration among industries and reduction of low-income groups.

The National Income Doubling Plan forecasted that industrial production in the target year of FY1970 would increase by around 3.3 times larger than FY1960, so that the six targets were set as follows from the viewpoints of industrial policy:

- (1) Improving international competitiveness by investing in newly introduced equipment and pursuing large capacity facilities with building industrial complexes;

- (2) Strengthening of investment funds and capital base;
- (3) Securing stable supply of imported raw materials and fuels at reasonable prices;
- (4) Promoting optimal allocation of industries to reduce regional disparities;
- (5) Encouraging research and development activities and training technologists; and
- (6) Modernizing small- and medium-sized firms and establishing streamlined divisional cooperation among firms.

The National Income Doubling Plan forecasted that the growth rate of agriculture would be 2.9 percent *per annum*, which was far lower than GDP/GNP and the national income growth rate. But it estimated that the population engaged in agriculture would decrease by 2.9 percent so that productivity would grow at the rate of 5.8 percent *per annum*. And the Plan stressed that one of the most essential points of agricultural modernization was the introduction of management systems equivalent to business enterprises. The Plan set the targets to modernize small- and medium-sized firms on reducing disparity among firms, proper-sizing of firms, investing new equipment, strengthening capital base, liberalizing labor relationships, and so on.

While industrial policies in postwar Japanese high-growth period were planned and implemented with a deep combination of economic plans, as mentioned above, theoretically, industrial policies were regarded as counteraction for broad market failures, including coordination with external economic effects, increasing returns to scale, intertemporal resource allocation problems, and so on. Concerning the theoretical basis for industrial policies, according to Ohno (2006, pp.173-74), the following two concepts were important:

- (1) Excess competition was one of the most important reasons for official intervention. Encountering a recession, the Japanese government frequently recommended industries to agree on output cartels, to scrap and consolidate excess capacity, and accept or promote corporate mergers. In addition, the government often resorted to export quota allocation to forestall the accusation of “*torrential exports*” by trading partners.
- (2) Infant industry promotion was another excuse for government strong guidance, which is a classical theory of industrialization first proposed in the nineteenth century. In short, this theory suggests that burgeoning industries with high initial cost should be temporarily protected from imports by tariffs if they can reduce costs and reap profits, according to the learning effect and increasing returns, which are the key determinants of the validity of infant industry promotion.

Whether industrial policies were effective and promoted high growth in Japan or not has been long debated. Okazaki (1998), Ohno (2006), Aghion and Griffith (2005), Krugman (1994), and some other studies support the positive role of industrial policy for Japanese high growth in the postwar period.

Komiya et al. (1984) appear neutral, since they do not support government intervention but accept its positive role in information diffusion. On the opposite side, some studies contest the validity of industrial policy, including Flath (2005), Kohama and Watanabe (1996), Miwa (1996), and Tsuruta (1982). Not on a theoretical framework but on practical views, some policy analysts and economists belonging to the development-state school insisted that the government played a sizable role in economic development, in particular, in East Asian countries. From the viewpoint of this development-state school, for example, Johnson (1982) focuses on Japanese development and policy of MITI (Ministry of International Trade and Industry), Amsden (1989) deals with Korean development as Asia’s next giant, and Wade (1990) analyses Taiwanese economic development. While the World Bank (1993) highlights government’s role in human capital accumulation, promotion of high saving, reduction of poverty, and so on; in other words, anything but industrial policy. It inquires “*Did Industrial Policy Increase Productivity?*” (World Bank 1993, p.312) and answers “*Overall, the evidence that industrial policy systematically promoted sector with high productivity change is weak.*” (World Bank 1993, p.316) Among these studies on industrial policy, Ono (2006, p.171) summarizes its effects on the automobile industry, which is one of the most remarkable leading industries in Japan:

As for the automobile industry, both rejection and acceptance of official intervention existed. MITI tried to merge automobile companies prior to trade liberalization because domestic producers were considered too small and numerous to compete effectively with the American giants. But automobile companies refused MITI’s initiative, remained separate, and did very well subsequently. However, it should also be recalled that the automobile industry was protected by high tariffs in its early stage of development.

7. Liberalization Process and Re-Integration to International Economy

During the first decade after the war, the Japanese economy had been managed under strong control of the government. The government directly regulated prices and production of some important materials and trade. But this strong control and regulation by the government had been regarded temporary and gradually, and the economic regime was transferred to toward the free market system. Concerning international trade and capital transfer, the postwar Japanese economy began with a closed regime and also gradually had been liberalized. And the single exchange rate was introduced after the Dodge Plan in 1952, which promoted external transactions to a sizable extent. Sadahiro (1992) summarizes regulation of the postwar Japanese economy in Table 7-1.

Table 7-1: Trends of Postwar Government Control

	Peak Time		Number as of			
	Date	No.	1949.4	1950.4	1951.3	1952.3
Number of Production Goods under Government Allocation	1946.2	252	233	49	24	7
Number of the Goods under Government Rationing	1947.2	64	57	16	8	6
Number of Price Control	1949.3	2129	2128	531	327	148
Number of State Enterprises Implementing Government Controls	1948.3	15	12	7	0	0

Source: Sadahiro (1992) p.45 Table 6.

Some economic plans in their early stages, including the Five-Year Plan for Economic Self-Support, the New Long-Range Economic Plan, and the National Income Doubling Plan, strongly proceeded with economic liberalization, in particular external areas such as trade and foreign exchange. For example, the Five-Year Plan for Economic Self-Support points out four directions of the Plan: economic self-support, increase in employment, economic stabilization, and coordination with qualitative improvement and quantitative development in the Japanese economy. Among these four directions, the Plan states that the Japanese economy had been dependent on U.S. aid and special procurement orders generated by the Korean War, but had to set the target of expanding exports to balance of payments and catch up with the world trends of trade liberalization. Along with some related economic plans, trade liberalization proceeded as follows:

Table 7-2: Outline of Trade Liberalization Process in Postwar Japan 1960-86

date	liberalized proportion (%)	number of liberalized items	liberalized item(s)
1960.4	41	1,443	coffee beans, sewing machines for household use, ceramics, iron scrap, and beef fat
1960.7	42	1,504	Cow hides
1960.10	44	1,985	pig iron and cocoa bean
1961.4	62	2,645	raw cotton, raw wool, radios, motorbikes, ordinary ferrous material, bicycles, buses, and cargo trucks
1961.7	65	2,757	soybeans and instant coffee
1961.10	68	3,257	silver, nickel, and wrist watches
1961.12	70	3,427	stainless steel, general plate glass, and clothes
1962.4	transition from positive list system based on SITC classification (item number: 4120) to negative list		

	System Based on Brussels Tariff Nomenclature					
date	liberalized proportion (%)	residual quantitative import restriction items			number of non- liberalized items	liberalized item(s)
		Total	industrial products	agricultural products		
1962.4	73	466			492	general plate glass
1962.10	88	232			292	crude oil, pulp for paper, and graphite
1963.4	89	197			229	steel ingot and caustic soda
1963.8	92	155	87	68	192	crude sugar
1964.1		152	84	68	189	sorghum
1964.4	close to 93	136	69	67	174	color television sets
1964.5		136	69	67	174	fresh lemon
1964.10		123	56	67	162	ammonium chloride, ammonium sulfate, and bulldozer
1965.10	over 93	122	55	67	161	passenger cars
1966.4		120	54	68	165	cocoa powder and continuous fiber (synthetic)
1968.4		122	54	68	165	cosmetics
1969.4		120	52	68	163	frosted plate glass
1969.10		118	50	68	161	sewing machines for industrial use
1970.2	close to 94	109	45	64	152	wine
1970.4		98	39	59	141	boiler, coffee, and machine tools
1971.1		80	31	49	123	whisky and color film
1971.6	over 94	60	20	40	106	black tea
1971.10	close to 95	40	12	28	87	pork
1972.4	over 97	33	9	24	79	ham, bacon, light and heavy oil, peripheral devices of computers, aviation radar
1973.4		32	8	24	83	Higher-priced calculators, electronic accounting machines, and integrated circuits (less than 200 elements)

1973.11		31	8	23	82	dates, inedible seaweed, and denatured dates
1974.10		30	8	22	84	malt
1974.12		29	7	22	83	integrated circuits (more than 200 elements)
1975.4		29	7	22	84	n.a.
1975.12		27	5	22	82	computers and peripheral devices
1977.4		27	5	22	80	tobacco
1978.4		27	5	22	79	canned ham or bacon
1980.1		27	5	22	73	gold vein, balloons, and airships
1980.5		27	5	22	78	(5 items added because of ratification of Convention on International Trade in Endangered Species of Wild Fauna and Flora)
1981.10		27	5	22	79	(DDT added)
1982.3		27	5	22	79	civilian aircraft and engines and parts
1984.5		27	5	22	80	(mensurative and detective parts and accessories for nuclear fuel material added)
1984.7		27	5	22	80	High-test molasses and other sugars
1985.4		27	5	22	80	pork preparation
1986.4		27	5	22	80	leather and leather shoes

Note: After 1973, the liberalized proportion had not been calculated.

Source: Komiya (1988) p.189 Table 3.

These liberalization measures proceeded along with the multilateral trade negotiations, usually called a “Round,” under the GATT regime such as following Table 7-3:

Table 7-3: GATT Trade Rounds

Year	Place/Name	Subjects Covered	Countries
1947	Geneva	Tariffs	23
1949	Annecy	Tariffs	13

1951	Torquay	Tariffs	38
1956	Geneva	Tariffs	26
1960- 1961	Dillon Round	Tariffs	26
1964- 1967	Kennedy Round	Tariffs and Anti-dumping Measures	62
1973- 1979	Tokyo Round	Tariffs, Non-tariff Measures, “Framework” Agreements	102
1986- 1994	Uruguay Round	Tariffs, Non-tariff Measures, Rules, Services, Intellectual Property, Dispute Settlement, Textiles, Agriculture, Creation of WTO, etc.	123

Source: WTO web site (https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm)
(accessed on June 30, 2016)

Concerning the re-integration of Japan into the international economy, Japan joined some important international organizations on world economy with some implications as follows: First, Japan joined the GATT as a provisional member in 1953 and obtained full membership in December 1955, and finally, transitioned to Article 11 nation of the GATT in 1963, which implies that it would not be permitted to restrict imports as an excuse for the balance of payments; Second, Japan joined the IMF in 1952 and completed the transition to Article 8 nation of the IMF in 1964, which implies that it would be prohibited to control foreign exchange as an excuse for the balance of payment. The negotiation processes are fully explained by some existing literature, for example, Komiya (1988), in particular, whose fourth chapter deals with the GATT entry process and the third chapter of Asai (2015), in particular, focuses on the IMF process.

Moreover, some international organizations provide important statistics manuals in economic fields, including the System of National Accounts of the United Nations, the Balance of Payments of the IMF, the Consumer Price Index of the International Labor Organization as follows:

SNA: <http://unstats.un.org/unsd/nationalaccount/sna.asp>
BOP: <http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm>
CPI: <http://www.ilo.org/public/english/bureau/stat/guides/cpi/>

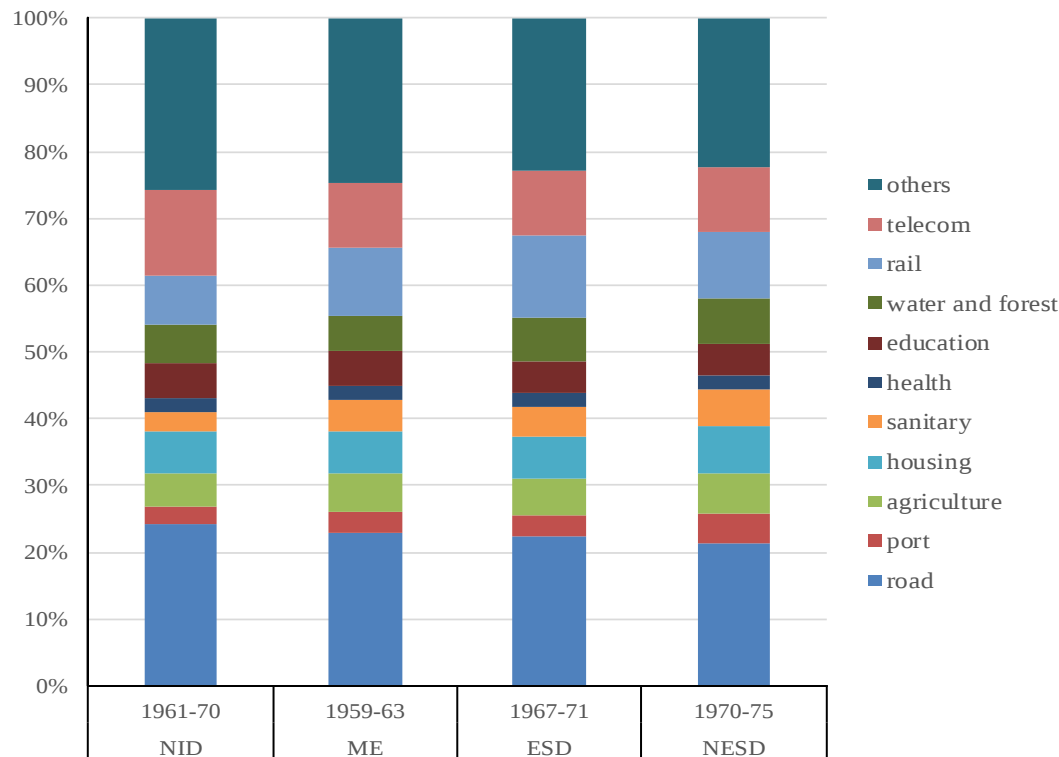
8. Infrastructure Building and Comprehensive National Development Plan

8.1 Infrastructure Building

Infrastructure building is the most important measure that the public sector can provide in the planning practice. Recognizing that insufficient infrastructure might become a bottleneck that

constrains higher economic growth, the National Income Doubling Plan addressed the infrastructure building first in the list of key challenges. The Plan indicated not merely the sum total of cumulative public investments during the planning period but also their allocation among sectors for the first time. Investment amounts and allocations, which included public works budgets of the central and local governments³³ and investment expenditures of public corporations, were projected at constant prices (Figure 8-1)³⁴.

Figure 8-1: Public Investment Allocation in the Economic Plans



Source: Authors based on the National Income Doubling Plan (NID), the Medium-term Economic Plan (ME), the Economic and Social Development Plan (ESD), and the New Economic and Social Development Plan (NESD).

Note: Figures for rail and telecom in NID are middle values of projected range.

Corresponding to rapid motorization (Figure 8-2), road construction had the largest share among public works sectors. Introducing the idea of beneficiary burden, automobile-related revenues such as gasoline tax were earmarked for road construction³⁵ and those tax rates were raised as needed. Tolls

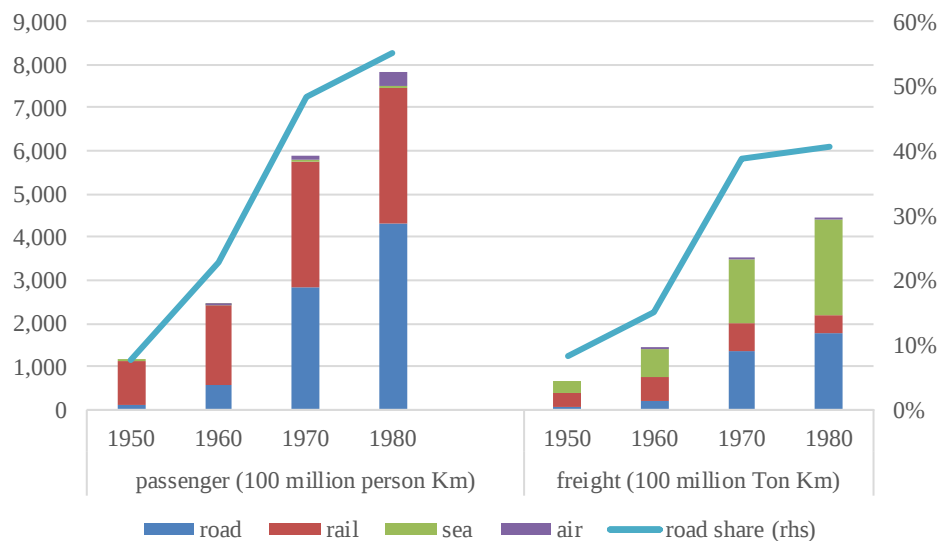
³³ Local own expenditures were much smaller than expenditures subsidized by the central government.

³⁴ While the investments of public corporations for highway, housing, waterworks, etc. were included in the projected infrastructure table of the National Income Doubling Plan, those for railway and telecommunication were not. The projected range of the latter investments was written in the text instead. In the succeeding plans the amounts of the latter ones were also included in the table.

³⁵ This program was not a cabinet law but a lawmaker-initiated legislation led by Kakuei Tanaka (1918-93). He was elected to the House of Representatives from Niigata Prefecture in 1947, held prominent positions in the cabinet and the party, and became the Prime Minister (1972-74).

for express highways were pooled not only for redemption but also to construct new express highways. These systems indeed played an important role to construct necessary roads in the high growth era, but they were recently criticized as constructing roads nobody used despite the fiscal consolidation needed. Finally, the public highway corporations were privatized in 2005, and earmarked revenues for roads were abolished in 2009.

Figure 8-2: Traffic Volume by Sectors



Source: Authors based on Inoki (1989) pp.122-123.

Because private enterprises provide electricity in Japan, electric power development was not included in the projected infrastructure table except for pilot plants that government electric institutions managed. Alternatively, figures of energy demand and supply by sources were projected in the chapter for private sectors. Power development was a major sector that the fiscal investment and loan program (FILP) funds were distributed to in the 1950s through the public financial institutions.

In tandem with economic planning, the special development act for each sector was enacted: road (1953), soil and water conservation (1960), port (1961), housing (1966), etc., and five-year development plans for those sectors were prepared independently by ministries having jurisdictions over them. Although the targeted figures in the economic plan were not the same as those of the individual plan in the strict sense, economic planners and officials in relevant ministries shared the direction of each infrastructure development through the planning process.

8.2 National and Regional Development Plans

It is natural to bear specific projects or locations in mind when planning infrastructure building. Transportation development will change flows of people, goods and services, and then will have profound impact on economic conditions of particular regions. Public works will also create jobs. As

the National Income Doubling Plan aimed to mitigate the so-called dual economic structure³⁶ and increase social stability, an equitable development across the Japanese archipelago would be an important agenda, especially in the political context. On the other hand, infrastructure development will bring about fierce struggles for local interests, unless there is a grand design. To address these challenges, the first comprehensive national development plan was compiled in 1962, and the second one in 1969, which were schematized by the Comprehensive National Land Development Act³⁷. Mikuriya (1989) understood the national development plan that drew a vision for the future Japan as a companion of economic plan. The Economic Planning Agency was in charge of these plans at that time³⁸, and the National Land Council played the same role as the Economic Council did in economic plans. While manufacturing concentrated in the four major industrial areas alongside the Pacific Belt Zone in the early 1960s, the 1962 Plan proposed the New Industrial Cities Program, under which 15 areas were designated; most were outside the Pacific Belt Zone (Figure 8-3)³⁹. They were given preferential treatment for taxes, budget expenditures, loan terms, etc., to promote industrialization. The 1969 Plan worked out the nationwide network and large-scale development projects, and then led to developing express highway network across the archipelago, Shinkansen bullet train network⁴⁰, and bridges between Honshu and Shikoku, etc.

³⁶ A large gap between traditional sectors and modern ones, such as agriculture and industry, small- and medium-sized business and huge ones, and rural villages and metropolitan cities, still existed.

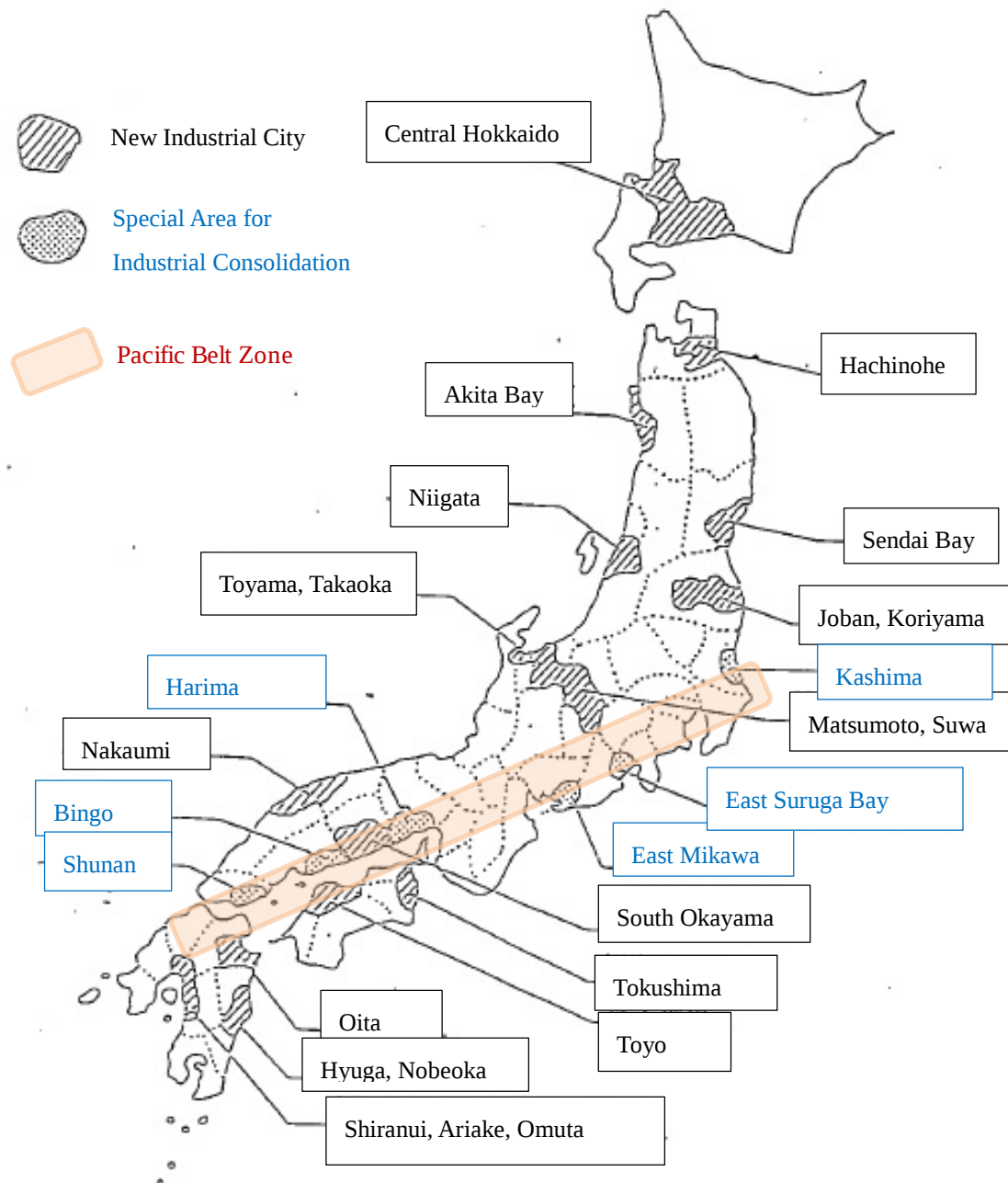
³⁷ Although the Act was legislated in 1950 with a hierarchical scheme of national, regional, and prefectural plans, only development plans for specific areas were decided in the 1950s; that is, plans for water hydroelectric resource development modeled on the TVA (Tennessee Valley Authority) created under the New Deal in the United States.

³⁸ The National Land Agency was established in 1971, and the function of comprehensive development plan moved to it. The Ministry of Land, Infrastructure, Transport and Tourism has been in charge since the reorganization of government ministries in 2001. The naming of development plans and acts also changed to the National Spatial Plan and Planning Act. The new Act has dropped an article that prescribed prefectural plans.

³⁹ Replying to the strong requests from less-developed regions alongside the Pacific Belt Zone, the government proposed another program called the Special Areas for Industrial Consolidation and designated six areas which located alongside the Pacific Belt Zone.

⁴⁰ The Shinkansen bullet train first launched between Tokyo and Osaka in 1964, just before the Tokyo Olympic Games. Its construction was financed by the IBRD (International Bank for Reconstruction and Development) loan. It was extended to Hakata (Fukuoka City, North Kyushu) in 1975, and the Shinkansen network now covers Hakodate (South Hokkaido), Niigata, Kanazawa, and Kagoshima (South Kyushu).

Figure 8-3: New Industrial Cities and Special Areas for Industrial Consolidation

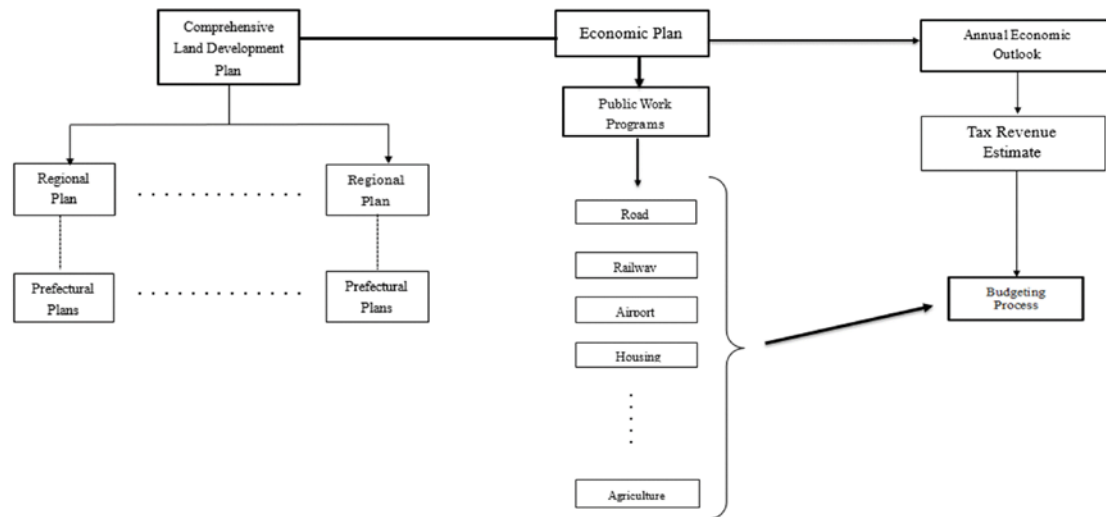


Source: National Land Agency

Regional development plans at the block level were also compiled under the Act, which listed smaller projects than did the national plan. On the other hand, prefectures and large cities also compiled their development plans individually, although they have not ever been prepared based on the Act. As local governors are elected by their citizens, those plans usually tend to reflect their public pledges or visions. They can express their opinions when the central government prepares the national

and regional development plans according to the Act.

Figure 8-4: Hierarchical Structure of Economic Plans in Japan



Source: Authors.

There were lots of plans prepared, as described in Figure 8-4, how the planned targets might come off through the budgeting process. While the government budget was formulated on an annual basis, the planned targets were the cumulative amount for the planning period and estimated at constant prices. Thus it would be difficult to reflect the planned figures directly to the annual budget. In addition, it would be desirable for the government to manage macroeconomic policy flexibly by considering the current macroeconomic conditions rather than paying much attention to the planned figures. However, sharing information among planners, officials in each ministry and budget authorities through the planning process would be useful to develop infrastructure efficiently.

9. Human Related Factors in Economic Plan

The National Income Doubling Plan (1960) emphasized the importance of human-related factors in economic development as strongly as that of economic factors. Preceding plans had treated such problems as somewhat external to economic planning and had not explicitly mentioned their quantitative targets. The 1960 plan devoted two chapters to human-related factors: human resource development and social security.

9.1 Human Resource Development

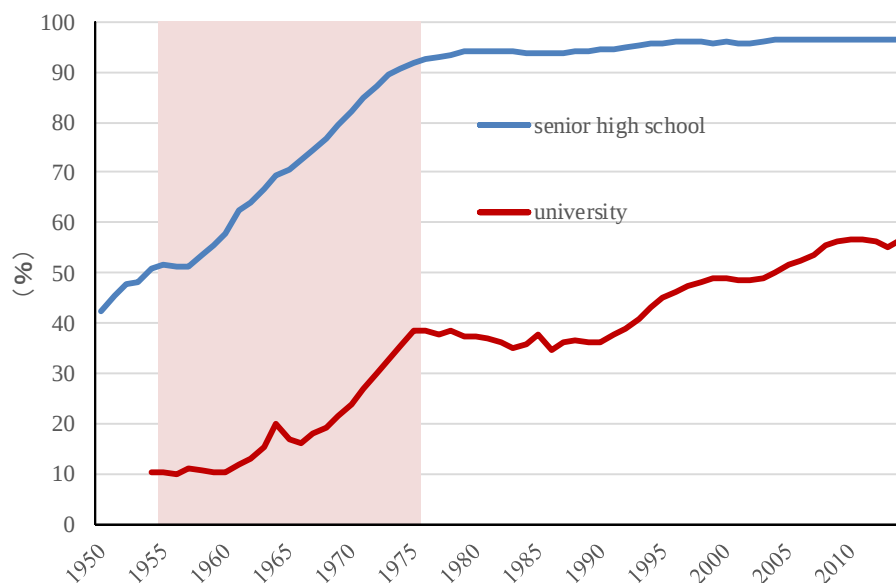
The third chapter of the public sector part of the Plan was titled “Development of Human Abilities and Advancement of Science and Technology.”

Although Japan's labor force did not constrain higher economic growth in postwar Japan owing to abundant cheap labor, the Plan understood that the growth rate of the labor force would slow down in the long run. A slowdown in labor input, progress in science and technology, and advancement of industrial structure; all would urge the development of quality human resources.

In view of the increasing importance of human resource development, especially ensuring the number and quality of scientists and engineers, the following was expected:

- (1) to increase the annual number of university graduates of science and engineering schools by 16,000 over the current figure of 29,000 in the ten-year period;
- (2) to increase the annual number of engineering high school graduates by about 85,000 over the current level of 95,000 in the same period;
- (3) to enhance graduate education to secure a sufficient number of teachers for the above education and for this purpose to promote academic-industrial cooperation;
- (4) to promote the policy of *secondary education for all* and to raise the proportion of junior high school graduates who go on to senior high school from 59.8 percent in 1960 to 72 percent by 1970; (the proportion actually reached 82 percent in 1970 and it exceeded 90 percent in 1974. Figure 9-1)
- (5) to increase skilled workers through vocational and job training; and
- (6) to raise the expenditures for research and development (R&D) from 0.9 percent of GNP to 2.0 percent⁴¹ by 1970.

Figure 9-1: Percentage of Students Who Go on to Senior High School and University



⁴¹ This figure includes all R&D expenditures conducted by government, universities, and private sectors. An average of other developed countries was around 2 percent at that time.

Source: Ministry of Education, Culture, Sports, Science and Technology

Note: Years 1955-75 are shadowed.

Cooperative industrial relations had contributed to productivity and skill formations in factories. According to Yonekura (1993), an enterprise union (a union organized at the company rather than the industry level) offered a cooperative workforce to management in exchange for job security and stable wage increases with seniority. This stable workforce enabled management to introduce new innovations successively and retrain workers when necessary. Rigid job classifications were not required, since wages were determined not by job classification but by seniority, rank, and merit evaluations. Therefore, the organized workforce in Japan was flexible and trained for multi-functional duties by the company. Japan's multi-functional workforce had made the famous just-in-time production system possible. So long as jobs were secured, unions did not oppose the introduction of new innovations. Under job security contracts with unions, managers had to transfer or retrain workers when they introduced new innovations. Incremental innovations (kaizen) were successively realized through quality control circles. Moriguchi (2013) points out that human resource upgrade of blue collar workers from junior high school to senior high school had a high affinity for quality control circles.

9.2 Social Security and Welfare

(From Poverty Alleviation to Universal Social Insurance)

The social security system offers a social safety net to ensure sound and anxiety-free lives against difficulties that might endanger the stability of living such as illness, injury, unemployment, retirement without means to earn money, and unforeseen accidents. Thanks to the social safety net, people can lead attractive and challenging lives without fearing risks. If the social safety net becomes unstable, people will feel uneasy and many of them will restrain consumption and save money for future anxieties. This will badly affect the economy and society will be less active.

The social security policies had developed in accordance with the socioeconomic changes. Japan had suffered mightily from war-related damages, including millions of lost households, five million people including soldiers returned from overseas, many war orphans and disabled veterans, and estimated unemployment varied from five millions to 13 million. The Ministry of Health and Welfare estimated that 8.8% of households, approximately three million people, needed aid in December 1945. Poverty alleviation measures were urgently required in social policies at that time.

The Public Assistance Act was legislated in September 1946, and was completely revised in 1950 based on the right of living prescribed in Article 25 of the new Constitution. It is a modern public assistance program that a person living in poverty has a right to be publicly assisted in a nondiscriminatory and equal manner. The Child Welfare Act (1947) and the Act on Welfare of

Physically Disabled Persons (1949) were also enacted.

During the deliberation of the Public Assistance Act, they discussed scenarios in which all unemployed persons and those in poverty could be publicly assisted, but the government would have lacked financial resources and it might have produced lazy persons. Responding to this discussion, the Unemployment Insurance Act was enacted in 1947⁴² as social insurance. If an employee loses his/her job, he/she can receive unemployment insurance up to six months. If he/she cannot find a new work within six months and has neither family support nor financial resources, he/she may resort to the public assistance program. It was the initial step toward a matured social security system that integrated social insurance and welfare.

Thanks to the high economic growth in the 1950s, people’s living standard was improved. Accordingly, it became more important to implement the measures to prevent general citizens from falling into poverty due to illness or aging, in addition to poverty alleviation measures. While public healthcare insurance and pension plans started in the prewar period, they were financially distressed by the postwar inflation. High economic growth made them afford to expand their operations, but they had not fully covered such traditional sectors as farmers, self-employed, and small businesses. A migration of population from farming villages to cities had made it necessary to depend on social security rather than mutual aid within large families. The Liberal Democratic Party, established in 1955 by the merger of conservative parties, laid out a promise to fulfill the universal healthcare insurance and pension plans. The National Healthcare Insurance Act was legislated in 1958, the National Pension Act in 1959, and all citizens were universally covered by 1961.

(Social Security in the Economic Plan)

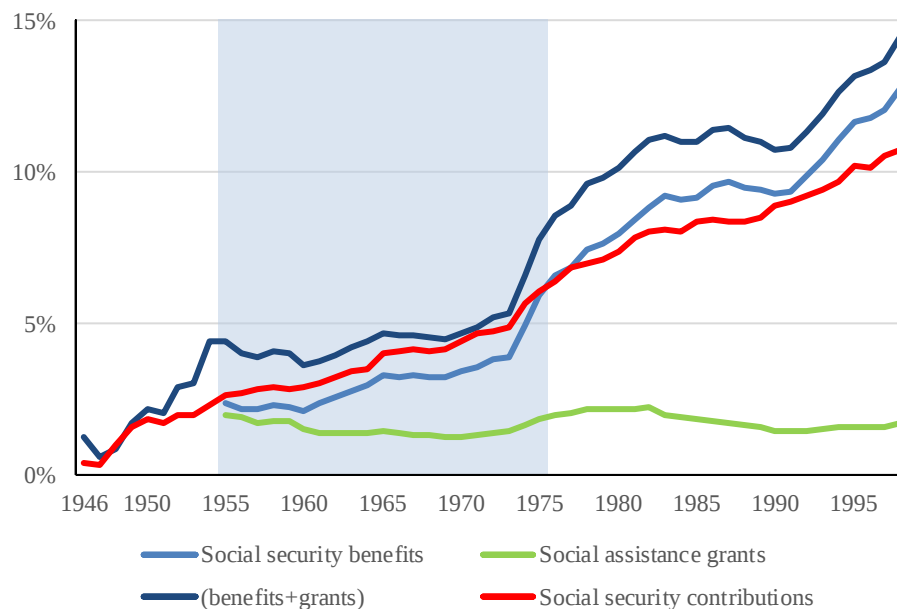
In the National Income Doubling Plan, the fourth chapter of the public sector part focuses on the social security, titled “Fulfillment of Social Security and Betterment of Social Welfare.”

The Plan stated that the dual economic structure and various gaps of wage and income were old problems of the Japanese economy. Although higher growth since 1955 had indicated some decline of dual economic factors and underemployment, the further decline could not be expected without promoting labor mobility among industries, especially from the traditional sectors to the modern industrial sectors, and paying special attention to those left behind. While they feared that the widening gap in income and wealth would bring about social instability, they warned that such measures as a minimum wage system, if excessively enforced, might choke economic growth by discouraging entrepreneurship and incentive to work.

⁴² It was replaced by the Employment Insurance Act in 1974, which expanded their operations from insurance to services for employment stabilization.

Considering these reserves, they argued that the role of social security should become more and more important to prevent a widening gap in income. In addition, the economic impact of social security could not be ignored: creating effective demand, counter-cyclical feature, and capital accumulation by pension system⁴³. It would also have a structural virtue to promote labor mobility and to reduce the income gap between agriculture and manufacturing. The Social Security Subcommittee Report went as far as to state, “*valuing social security makes it possible for the economy based on laissez-faire to grow. In this context a quantum leap of social security is essential to this economic plan.*”

Figure 9-2: Percentage of Social Security Benefit and Contribution to GNP



Source: Economic Planning Agency (1946-54: National Income Report, 1955-98: National Accounts, 68SNA).

Note: Years 1955-75 are shadowed.

As for social security, based on the prospect that public healthcare insurance and pension plans would attain to universally cover all citizens in 1961, the National Income Doubling Plan pointed out the next homework assignment: increasing benefits and harmonizing different plans⁴⁴. They also emphasized upgrading the unemployment insurance system with the outlook for fierce labor mobility

⁴³ The Social Security Subcommittee, which was a subsidiary of the Economic Council, estimated that the maturing of the pension system would produce an accumulated fund of some four trillion yen. GNP in 1960 was around 16 trillion yen, according to the National Accounts (68SNA, base-year=1990).

⁴⁴ Plans covering employees of public sector and big business usually pay better benefits than plans covering farmers, self-employed and nonworking persons. These differences still remain in both healthcare insurance and pension plans.

among industries. It was in the 1970s that the percentage of social security benefits to GNP had jumped (Figure 9-2).

On the other hand, social welfare was also necessary to complement social security. They discussed that the objective of social security and welfare is to prevent people from falling below certain living standards, that is, not to save poverty but to prevent people from falling into poverty. Although universal social insurance would soon come true, the insurance system had its own limitations. Therefore, social assistance for mother-child, physically or mentally disabled, and etc. should have been improved.

They added their view on the minimum standard of living, which used to be considered to be physical subsistence level and absolute. But they argued it relatively determined in accordance with the development of ordinary people’s lives on the ground of public perception for social solidarity that citizens should guarantee one another certain living standards.

Finally, some expressed alarm at Japan’s employment practices, that is, lifetime employment, seniority-oriented wage system, and odd retirement allowance⁴⁵, might impede labor mobility. They even proposed that universal child allowance should be studied⁴⁶, which would be expected to promote the seniority-oriented wage system to be remedied. In hindsight, farmers and young generations moved from rural areas to metropolitan cities in the high growth era independently of these practices. In the 1980s, these practices were regarded as major factors contributing to the success of Japan Inc., along with industrial policy. Now they are blamed for discouraging labor mobility from low productivity sectors to high productivity ones once again. These practices are common in the public sector and big business, which covered a smaller portion of employment in the 1960s than it does today. For a couple of stagnant decades, regular employees have gradually been replaced by non-regular employees such as dispatch workers and temporary ones who are outside these practices. Anyway it should be noted that the economic plan emphasized the importance of structural change, that is, the resource reallocation toward the more productive sectors.

10. Consensus Building with Private Sector and Academic Authorities

10.1 The Role of the Economic Council

As explained in Chapter 4, the Economic Council, an advisory committee to the Prime Minister,

⁴⁵ It was usual in Japanese big companies that the longer an employee was in office, the more generous his retirement allowance was.

⁴⁶ There exists a strong objection against a universal benefit from tax resources in Japan. It is in 1972 that the child allowance system with income-test started.

deliberated the new economic plan and submitted a draft to the government. Then the Cabinet approved it, and it became the official economic plan of the government.

The council discussed various economic matters to prepare the new economic plan. This process generally took from several months to a year. The council was composed of around 30 members who were learned and experienced persons from diverse backgrounds⁴⁷. When deliberating the new plan, additional temporary members were appointed, and more than 200 persons participated in the planning process. In case of the National Income Doubling Plan, four additional committees were established in the Economic Council: (1) the Overall Policy Committee in charge of coordinating the general planning, (2) the Public Sector Committee with ten subcommittees, (3) the Private Sector Committee with seven subcommittees, and (4) the Committee for Quantitative Analysis⁴⁸. According to Sadahiro (1993), although members were not appointed as official representatives of their belonging social groups but experts in some fields of the plan, their opinions reflected the opinions of their groups, and agreements made at the Council were expected to affect the decision making of their groups.

The Economic Planning Agency, as secretariat of the Council, coordinated the planning process. According to Komine (1993), the Agency, on the one hand, prepared discussion materials for the Council based on members’ requests. On the other hand, the Agency worked to form a consensus among many ministries in the government. When the Agency distributed the draft economic plan to all ministries of the government, it received no less than 1,000 comments. These comments were discussed amongst one another and compromises were reached. From his experience participating in the planning process, Professor Komine thinks the hypothesis of Aoki (1981) reasonable that each ministry acts as an agent of an interest group in the society and negotiations among various ministries are regarded as a kind of social bargaining.

It can be said that in Japan social bargaining was implemented efficiently in the process of drafting the economic plan.

10.2 Information Sharing in the Planning Process

Komine (1993) also views economic planning from the point of information sharing. He discussed

⁴⁷ Most members were business leaders, and some academic professors, economists and journalists. Some were ex-bureaucrats. Labor leaders and consumer representatives also joined the council in the late 1960s.

⁴⁸ Ten subcommittees for the Public Sector were: (1) Public Investment Allocation, (2) Industrial Location, (3) Transportation System, (4) Housing and Living Conditions, (5) Land and Water Management, (6) Energy Policy, (7) Science and Technology, (8) Education and Training, (9) Social Security, and (10) Fiscal and Monetary Policy. Seven subcommittees for the Private Sector were: (1) General, (2) Advancement of Industrial Structure, (3) Foreign Trade, (4) Agriculture and Labor Movement, (5) Small and Medium Business, (6) Wage and Employment, (7) Living Standards.

two points.

First, the basic policy stance of the Prime Minister was made public through economic planning. One of the most important roles of the economic plan was to show the long-term economic vision held by the Prime Minister. When a new Prime Minister was nominated, he was expected to come up with new economic targets and policies in a new economic plan. Prime Minister Ikeda drew up the National Income Doubling Plan officially to show his intention to pursue his campaign promise to double average wages in ten years. The feasibility of each Prime Minister’s agenda was reviewed through the planning process by the government and the Economic Council, and a more realistic policy package was made public in the form of an economic plan.

Second, information was shared by private companies and the government. Long-term economic projections for the economic growth rate, industrial structure and the labor market situation were presented in the economic plan. As an argument that setting guidelines improves economic growth through so-called announcement effects, he introduces Sato (1990) as follows:

When the government forecasts a certain level of economic growth, private companies believe that is guaranteed through the policy instruments. They set their own target based on this projection. In the process of setting targets, the officially projected growth rate is taken to be the bottom line of growth, and they try to do better. Consequently, the growth rate achieved turns out to be better than the projection proposed in the economic plan.

He proceeds to explain why the Japanese government had succeeded in gaining the confidence from the private sectors. Much information was exchanged between the government and private business before plan guidelines were set. He argues the notion that these guidelines were government products and simply handed down to private business to be wrong. There was a two way flow of information between the government and private business and give-and-take attitude on both sides. The government tried to gather information about the actual state of industry, and private business tried to understand macroeconomic conditions. Thus when guidelines were finally formulated, their basic thrust was already clear to private business.

Furthermore, he reminds us that the Japanese government maintained a so-called time-consistent economic policy by including long-term policy commitments in the economic plan, and refers the argument by Blanchard and Fisher (1989) that a government which promises long-term commitment to carrying out a policy will produce a better outcome than one which implements economic policies from a short-term point of view. He concludes that sharing of information and time-consistent economic policy resulted in private sector confidence in government economic management, and stable long-term expectations as well as savings and investment behavior oriented to a long-term

perspective.

10.3 Academic Authority

Eminent academic professors of economics and related fields belonged to the Economic Council. Many academic scholars joined subcommittees according to their specialties.

It is notable that all members of the Quantitative Committee were university professors or research institute fellows. They developed quantitative analyses and econometric models used for the planning exercises with planners in the Economic Planning Agency. They presented those studies at an international conference⁴⁹ and submitted papers to academic journals⁵⁰.

10.4 Communication with the Public

As closely explained in Chapter 13, the Economic Planning Agency published the Annual Economic Report (White Paper on Economy). The first report was written in 1947, under Professor Tsuru’s leadership⁵¹, to analyze the current economic conditions and to promote understanding of not only leaders but also ordinary people. It explained economic difficulties in an easy-to-understand way: for example, all of three sectors of the economy, government budget, private enterprises, and households, went into the red. Since then the report had been published every year and often generated phrases on everybody’s lips; “*it is no longer termed postwar*” (1956), “*investment induce investment*” (1961), etc. The director in charge of the White Paper used to be regarded as a chief economist of the government, and a multitude of staff grew as economists and were active in various institutions.

11. Evolution of Quantitative Method for Economic Planning

11.1 Method Before the Econometric Model⁵²

(Colm Approach)

The first full-fledged economic plan, the Five-Year Plan for Economic Self-Support (1955), assumed an average five percent economic growth rate for the planning period on the basis of the so-

⁴⁹ Shishido (1965) and Watanabe (1965) are papers presented at the Conference of the Social Science, by Research Council Committee on Economic Stability, the Brookings Institution.

⁵⁰ Examples are Tatemoto et al. (1967), Tsukui (1968), etc.

⁵¹ Shigeto Tsuru (1912-2006) was a prominent economist in Japan. He earned a PhD. from Harvard University in 1940 and lectured there. Returning to Japan in 1942, he held public office till 1948. He served as vice-minister for the Economic Stability Board (1947-48), and his work is best known for drafting Economic White Paper of 1947. In 1948 he took up a professorship in Hitotsubashi University in 1948, and became its president from 1972-75.

⁵² This section owes a lot to Shishido (1965).

called the Colm approach⁵³. At first economic growth was projected simply on the assumption of labor availability and labor productivity for the future. A breakdown of expenditures were then estimated. The Self-Support Plan assumed an annual growth rate of labor force at two percent, which was considered desirable from the viewpoint of employment policy, and that of labor productivity at three percent, and as a consequence total of a five percent GNP growth rate. In regard to the external balance, required imports were first estimated by means of the import ratio to GNP; then an export target was derived on the basis of world trade growth rate and the elasticity of Japanese exports to world trade. Although the Plan misjudged labor for the strictest constraint at that time, ignoring other more important constraints such as capital and foreign exchange, the economy grew rapidly due to an unexpectedly high growth of exports. Because the growth rates of GNP and exports doubled the targets, the plan had to be replaced by another one.

(Alternative Growth Rates Approach)

Recognizing a methodological shortcoming in the Colm approach, the next plan, the Long-Range Economic Plan (1958), adopted a method called “Alternative Growth Rates Approach” suggested by Professor Okawa⁵⁴. This method aimed at selecting among several alternative growth rates an optimal one consistent with full-employment, external balance, and the availability of domestic savings. They prepared 4.5 percent: around the prewar average, 8.9 percent: around the postwar average, and 6.5 percent: middle between the two. After checking the aforementioned balances, they took 6.5 percent as the most reasonable target. As a result of paying little consideration to the strong upward trend that had been prevailing since 1955, there were some serious underestimations; while the assumed exports target of 10.5 percent did not diverge seriously from the actual performance of 12 percent, the four percent assumption for the private investment target was far off from the actual 17.4 percent. The actual GNP growth rate of 10.5 percent was so much divergent from the target that this replacement plan was itself destined to be quickly replaced.

The National Income Doubling Plan (1960) also adopted an “Alternative Growth Rates Approach.” After several experiments examining such factors as labor, energy, foreign exchange and domestic savings, the rate of 7.2 percent, on the assumption that GNP would double in ten years, was selected in the draft⁵⁵. However, because of a demand from the highest level⁵⁶, the plan declared in the

⁵³ Colm (1952). Gerhard Colm (1929-72) was best known for his work as the Chief Economist of the National Planning Association (1952-68). He also served as a leading economic adviser for the Roosevelt and Truman administrations. He was forced to immigrate to the United States as a refugee from Nazi Germany.

⁵⁴ Kazushi Okawa (1908-93) was a notable economist in Japan and famous for his work on the long-term economic statistics. He was a professor of Hitotsubashi University and served in the government several times. He was appointed as the first president of the Economic Research Institute, Economic Planning Agency (1958-61).

⁵⁵ Because the base year of figures in the plan was the 1956-58 average, projected annual GNP growth rate was 7.8 percent for 13 years (1957-70).

⁵⁶ Osamu Shimomura (1910-89) was one of the most famous among the Prime Minister Ikeda’s brains.

preamble that the target growth rate for the first three years (FY1961-63) was set at 9 percent, recognizing that there would be very strong factors to support economic growth, such as rapid innovation, abundant labor, and so on. It implied a rate of 6.4 percent for the remaining period to attain 7.2 percent on the average for the ten years, and the plan stated that the doubling of national income should be attained in and around ten years in view of various future uncertainties.

The plan assessed the supply and demand balance of key commodities and the labor market, and it presented not only macro targets but also such structural figures as exports, imports, industries, energy supplies, employment, and so on.

11.2 Econometric Model and Input Output Analysis

Although the National Income Doubling Plan presented various figures from macro to micro, there were some inconsistencies between them. For example, the growth rate of private investment was projected at 6.9 percent, while that of such capital goods supply as steel, machinery, etc. was assumed more than 10 percent. Addressing these challenges, the Economic Planning Agency tried a state-of-art method at that time, econometric modeling, with close collaboration with young and energetic university professors who gathered to the Quantitative Committee under the Economic Council as described in chapter 10.

They made use of an econometric model called “Medium-term Macro Model” and an Input-Output Analysis model originally developed by Wassily Leontief⁵⁷, to prepare the Medium-term Economic Plan (1965). The Plan was submitted to the Prime Minister with a 12-page supplementary material titled “National Accounts in the Targeted Year,” the reports of the Quantitative Committee and other committees attached. It was the first time that an econometric model, which was supposed to be studied just for academic use, was utilized for such practical use like economic planning⁵⁸.

The Medium-term Macro Model was composed of about 40 equations and 60 variables, half of which were from the National Income Statistics and rest from international trade, labor, price and monetary statistics. A solution to the model, a set of final demands, would become an input for the Input-Output Analysis Model output, labor demand, and required capital by sectors could then be

In the late 1950s he argued that the Japanese economy was in a historic burgeoning era, and he had shown a more optimistic view on economic growth of Japan than other economists in the Economic Planning Agency or the Bank of Japan. He joined the Ministry of Finance in 1934 and worked until 1959. He became a board member of the Development Bank of Japan (DBJ) in 1960, and the first president of the Research Institute of Capital Formation, DBJ in 1966.

⁵⁷ Wassily Leontief (1906-99) won the Nobel Prize for Economics in 1973 for his works on input-output tables and the linear activity model of general equilibrium with these tables.

⁵⁸ Around the same time, another macroeconomic model was developed for a short-term forecast by the Economic Research Institute of the Economic Planning Agency. It was used for a short-term forecast and its multipliers were used to assess the economic impact of fiscal and monetary policies, etc. It had evolved into the EPA World Econometric Model in the 1980s.

obtained. Inconsistency among planned variables was dissolved, and more importantly price development analysis became possible, which was necessary for curbing inflation that emerged as a critical issue in the mid-1960s. The latter also made it possible to analyze such nominal values as savings-investment balance, balance of payments, and fiscal variables.

Another merit of model is that it could be easily judged whether discrepancies between planned forecasts and actual figures were brought about by errors of the model itself or inaccurate assumptions for exogenous variables. The Quantitative Committee studied discrepancies for 1967 and 1968, and reported that errors owed to inaccurate assumptions were larger than those of the model itself.

11.3 Multi-sector Econometric Model and Turnpike Model

(Medium-term Multi-sector Econometric Model)

Persistent inflation was caused partly by excess demand, and partly by productivity gaps among sectors. Oil shocks accelerated inflation in the 1970s. Considering that those challenges required more consistent sector analysis, the Economic Planning Agency tried to link a macroeconomic model with an input-output model simultaneously, and finally constructed the Medium-term Multi-sector Econometric Model to prepare the Economic Plan for the Second Half of the 1970s (1976). Major features of the model were given below (Figure 11-1):

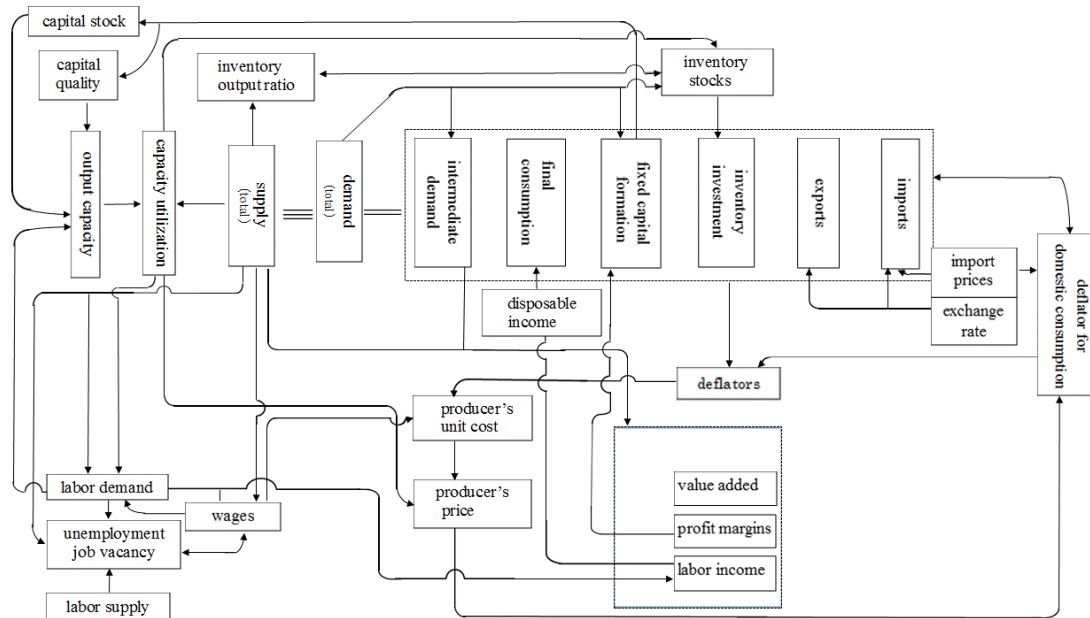
- The model consists of 15 sectors (15 commodities (goods and services) and 14 industries).
- Macro consumption is determined by consumption function, and then divided by sectors in accordance with their relative prices.
- Investment in each sector is determined by the stock adjustment principle or the accelerator principle.
- Exports and imports of each sector are determined by their demand conditions and price competitiveness.
- Intermediate input matrix is derived by multiplying the output vector by the input coefficient matrix.
- Capital stock of each sector is obtained by the capital accumulation equation: adding investment to the previous stock minus depreciation.
- The number of employees of each sector is gradually adjusted to its optimal level that is determined by its output and unit labor cost.
- Production function with capital and labor inputs determines the potential output of each sector.
- Wages of steel and machinery sectors⁵⁹ are determined by the Phillips curve, and they

⁵⁹ In Japan wages are negotiated at the annual spring round and those sectors whose labor unions belong to the JCM (Japan Council of Metalworkers' Unions) have played a leading role; this includes steel, automobiles, electrical products, etc.

diffuse to other sectors.

- Supply-demand balance and unit cost of each sector affect its price development. Supply-demand balance is represented by capacity utilization rate (actual output divided by potential output) or inventory rate. Cost consists of labor and intermediate and other inputs.

Figure 11-1: Flow Mechanism of the Model



Source: Economic Planning Agency (1984) p.7.

Besides planning practice, this model was utilized to assess the impacts of tax reform as to introduce the consumption tax in 1989, replacing commodity taxes whose rates varied by goods and services⁶⁰.

(Turnpike Model)

Using the same data with this model⁶¹, another type of multi-sector model was developed, named the Long-term Multi-sector Model, or the Turnpike Model. Suppose that you are planning to drive and want to minimize your driving time. You should drive the following route: get on a nearest express highway as quickly as possible and keep driving on the expressway until you reach to a closest exit to

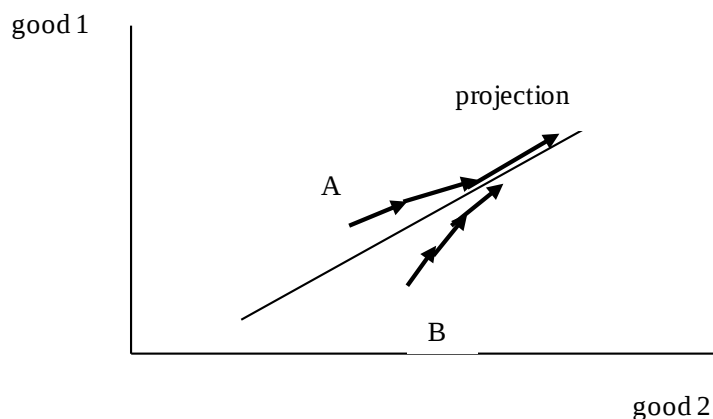
⁶⁰ The consumption tax is a VAT (value-added tax) type tax where taxes included in intermediate inputs and investments can be deducted. An input-output table can incorporate this multistep mechanism explicitly. The 1989 reform was revenue neutral, but its impacts differed by goods and service. Consequently the impact on GDP was not neutral. Because a VAT for investments is deductible, such revenue-neutral reform as in 1989 will be expected to promote investments and enhance growth.

⁶¹ Capital stock matrix was also needed, which was estimated by perpetual inventory method with a benchmark of the National Wealth Survey. The National Wealth Survey conducted by the Economic Planning Agency in 1970 is the latest data. Annual capital flow matrices estimated for the Medium-term Multi-sector Model were accumulated and depreciated with benchmark of the 1970 stock data.

the destination.

The turnpike theorem⁶² argues that a balanced growth path⁶³ is just like an express highway. According to Tsukui (1966), economic planners can derive interesting suggestions from the strong version of turnpike theorem: all efficient paths at some time approach the balanced growth path and spend most of the planning period in its neighborhood no matter what target (or what start point) may be set up. Therefore, planners are wise to put aside a vexing question of value judgments and plan to lead the economy efficiently toward the balanced growth path and then to keep it growing along that path. (Figure 11-2)

Figure 11-2: A Turnpike Path



Source: Authors.

Tsukui (1968) tested the turnpike theorem on the Japanese economy for 1955-60. He constructed a linear programming version of the dynamic Leontief model, and compared the computed growth path with the actual one. He found the discrepancies between them was very small, and concluded that the Japanese economy had grown from 1955 to 1959 with a very high efficiency that would be difficult to attain even under intensive central planning⁶⁴. He was a member of the Quantitative Committee and advised the Economic Planning Agency to develop the Long-term Multi-sector Model.

The model was an application of the turnpike theory to the actual Japanese economy with a number of modifications for the purpose of practical use. Major differences from a standard model are (1) constraints on increases in exports and imports, and (2) the assumption of technological changes based

⁶² The turnpike theorem was first enunciated by Dorfman, Samuelson, and Solow (1958) and was proved by Morishima (1961), Radner (1961), McKenzie (1963), etc. for various versions.

⁶³ von Neumann (1945) used a disaggregated general equilibrium model, while Ramsey (1928) used a macro model.

⁶⁴ Until the 1960s, the Soviet Union was believed to perform better economically than the United States. A symbolic episode was the Sputnik Shock that occurred when the Russians launched the world's first artificial satellite in 1957.

on engineering information⁶⁵. Due to these modifications, the model no longer showed the turnpike property in its purest form characterized by a linear balanced growth path. However, the model still held the essential features in the sense that the optimal path solved by the model was not affected by the change in terminal conditions.

The model was solved by linear programming⁶⁶ methodology. Production function with factor substitution is approximated by a linear combination of more than one production process. A putty-clay approach was adopted for capital stocks: once capital stocks were installed in a particular sector, they were assumed to be inconvertible from one sector to another, but not necessarily so between production processes within a sector.

The objective function to be maximized in the Model was based on utility defined by the composition of consumptions by sectors and benefits from non-productive social overhead capital stock⁶⁷ over the entire simulation period. The problem of arbitrariness inevitably involved in setting terminal conditions was circumvented by solving the model well beyond the planning period and disregarding the solutions for the excess periods⁶⁸.

This model was used to draw a long-term optimal and realistic growth path, such as “Japan in the year 2000” prepared by the Economic Council in 1982 before deliberating a new economic plan.

(SNA)

Econometric models were advanced in tandem with the development of GDP statistics. When these multi-sector models were first developed in the mid-1970s, GDP statistics were not yet compiled on the System of National Accounts (SNA) defined by the United Nations in Japan. Thus it took lots of work and time to prepare data for these models; no less than 20 periods of Input-Output tables consistent with GDP components. The 1968-SNA was introduced in 1978 in Japan and GDP statistics came to be compiled by the commodity flow approach, which reduced somewhat the burden for data preparation. The Economic and Social Research Institute (ESRI) is scheduled to introduce the 2008-SNA⁶⁹ by the end of 2016. The 2008-SNA will compile GDP statistics based on a supply-use table, and the multi-sector model data have the same format with a supply-use table (Figure 11-3). If supply-

⁶⁵ Delphi study was conducted to make the intermediate-input coefficients and capital coefficient for the future. Delphi study was to hear a forecast from multiple experts in each industry with feedback and follow-up hearings.

⁶⁶ Rapid progress in computer technology makes the simulation speed much faster than at that time, and now non-linear programming models can be solved easily.

⁶⁷ While such infrastructure as roads and ports become capital inputs for the production function of the transport sector, such public capitals as parks produce benefits for consumers.

⁶⁸ Investments at the last period will become zero to maximize the objective function, including the consumption at the last period.

⁶⁹ Another salient feature of the 2008-SNA is the capitalization of Research and Development (R&D), recognizing that intangible assets now play a more important role in the knowledge-based economy.

use tables were provided every year and retroactively for more than 20 years, the burden would be reduced a lot, although we no longer maintain a multi-sector econometric model⁷⁰.

Figure 11-3: Data Structure of the Model

industrial sector, etc. goods and services, etc.	industrial sectors	consumption	fixed capital formation	inventory	external sector	total (output)
goods and services	intermediate input	consumption of private non profit institutions serving households government final consumption final consumption of households (by object)	private investment in machinery and equipment (by industry) private housing investment	inventory investment (by industry)	imports (by goods and services) exports (by goods and services)	
compensation of employees						
business surplus						
consumption of fixed capital						
indirect tax (less) subsidies						
statistical discrepancies						
total (output, value added)						

Source: EPA (1984) p.5.

11.4 Critique of Econometric Model

The introduction of rational expectations in macroeconomics in the mid-1970s was an intellectual revolution and a serious challenge for large-scale backward-looking econometric models. These models have steadily lost their potency in the academic world since the Lucas critique (Lucas 1976). Lucas (1976) argued that changes in policy have an immediate effect on agents’ decision rules since they are inherently forward-looking and adapt to the effects of the new policy regime. This implies that the reduced-form coefficients in econometric models change with changes in policy coefficients.

Although large-scale econometric models are still utilized for practical use, we cannot ignore the Lucas critique. In addition to existing large-scale econometric models, we must take interest in economic models built on firm micro-foundations⁷¹. If multi-sector analysis is required, a computable

⁷⁰ The Cabinet Office has developed the Economic and Fiscal Model to prepare economic and fiscal projections for medium to long-term analyses since 2002. This model incorporates hundreds of fiscal variables not only for the central government but also for local governments and social security funds in a macroeconomic model in response to the need of fiscal consolidation analysis.

⁷¹ The Lucas critique suggests that we should model the *deep parameters* relating to preferences (utility function) and technology (production function) that are assumed to govern *individual behavior*.

general equilibrium (CGE) model⁷² will be useful. If cyclical fluctuation or policy shock analysis is of interest, a dynamic stochastic general equilibrium (DSGE) model will be a cutting-edge tool favored by the monetary authorities.

12. Short-Term Economic Policy Coordination

As reported in Figure 8-4, other than long-term economic plans and comprehensive national development plans, some short-term economic policy coordination tools were also employed in Japan to stabilize business cycle fluctuations, including estimation of economic outlook⁷³ for each fiscal year and preparation of temporary economic measures. These policy measures have been also indicative and based on the free market system. The main purpose of economic stabilization in Japan had been shifted from cooling-off an overheated economy to avoid balance of payment deficits in high-growth period to a boosting, or reflation, policy after the bubble burst in the 1990s.

Yoshioka (1998) reports that the main contents of economic outlook of each fiscal year are 1) Gross Domestic Product; 2) Labor and Employment; 3) Industrial Production; 4) Prices; and 5) Balance of Payment. Table 12-1 reports some economic indicators of outlook and actual results quoted from EPA (1976)⁷⁴.

Table 12-1: Short-Term Economic Outlook and Actual Figures in 1955-60

	FY1955		FY1956		FY1957	
	outlook	actual	outlook	actual	outlook	actual
Real Growth Rate (%)	4.5	10.8	0.2	6.2	6.5	7.8
Growth of Industrial Production (%)	1.5	11.4	7.2	24.8	12.5	12.3
CPI Inflation (%)	-1.7	-1.2	0.0	1.3	0.4	2.5
Current Account Balance (\$ mil.)	+53	+326	+205	-229	-50	-148
	FY1958		FY1959		FY1960	
	outlook	actual	outlook	actual	outlook	actual
Real Growth Rate (%)	3.0	6.0	5.5	11.2	6.6	12.5
Growth of Industrial Production (%)	4.5	0.0	6.1	25.0	11.8	22.5
CPI Inflation (%)	0.2	-0.4	0.5	1.8	1.1	3.8
Current Account Balance (\$ mil.)	+150	+464	+160	+193	+150	-70

(Source) EPA (1976) pp.608-703.

⁷² The Global Trade Analysis (GTAP) is famous as a multi-country and multi-sector trade-linked CGE model; the GTAP database is also used to analyze climate change policy as well as trade policy.

⁷³ This economic outlook also has been one of the most important foundations of the fiscal budget.

⁷⁴ In high-growth periods, e.g., the 1950s, Japan’s labor market had had some excess supply of labor due to dual economy so that employment and labor indicators are not reported.

It will be easily found out that growth rates had some tendency to be underestimated while balance of payments were sometimes overestimated. According to this economic outlook, the consistency among economic policy measures, including fiscal policy, monetary policy, labor policy, trade policy, energy policy, and so on, were ensured in the government agencies⁷⁵. For example, tax revenue would be estimated consistently to nominal growth rate mediated with some elasticity value, and monetary policy would be tightened/loosened if the inflation rate would upturn/downturn, respectively. Concurrently with the announcement of the numerical outlook, the government had also revealed basic policy stances and important policy topics in each fiscal year for the indicative purpose. Based on these economic outlook and policy stances and topics, the Minister of State addresses the Economic Policy Speech at the ordinary session of the National Diet. The policy stances and topics in FY1956, which was the first year of implementation of the Five-Year Plan for Economic Self-Support, e.g., are as follows:

- (1) Basic Policy Stances: The challenges will be promotion of the tendency toward economic normalization, enhancement of industrial basis under the stable economy, active measures to promote exports, and expansion of job opportunities in a nod to the importance of employment.
- (2) Important Policy Topics:
 - 1) Promotion of exports;
 - 2) Enhancement of industrial basis;
 - 3) Promotion of small- and medium-sized enterprises and construction of new agricultural communities;
 - 4) Promotion of science and technologies;
 - 5) Preservation of national land and promotion of development;
 - 6) Expansion of the job opportunities;
 - 7) Stabilization of the national life;
 - 8) Conservation of balanced budget and normalization of monetary system; and
 - 9) Stabilization of prices.

The annual outlook of the economy had been estimated according to so-called step-by-step or trial-and-error approach, while many long-term economic plans employ an econometric approach that adopts econometric models for estimation of growth rate, inflation, and so on⁷⁶. The step-by-step approach is based upon some results of a specific *enquête* or hearing and original economic research. All items will be predicted by checking interdependency among them and repeating trial-and-error processes step-by-step. The Economic Outlook of Japan has been employing this approach for a long time. Advantages of this method are as follows:

- (1) Structural changes are easily introduced;

⁷⁵ Here, the central bank has been included into the integrated government.

⁷⁶ Chapter 10 of this study deals with a quantitative method for economic plans.

- (2) Government intentions are easily reflected; and
- (3) Low cost compared with the construction of a large macroeconomic model and database.

Since both step-by-step and econometric approaches are employed for short-term economic outlook and medium- and long-term economic plans, Yoshioka (1998) summarizes some advantages and disadvantages of these two methods below in Table 12-2:

Table 12-2: Advantages and Disadvantages of Forecasting Approach

	Step-by-Step Approach	Econometric Approach
Cost	Less	More
Consistency	Less	More
Objectiveness	Less	More
Implementation of Government Intentions	Easier	More Difficult
Reflection of Structural Changes	Easier	More Difficult
Software	Possibly general-purpose spread-sheet application	Econometric application (model simulation)

Source: Authors based on Yoshioka (1998) p.9 Table 3.

As reported in Table 12-1, the short-term economic outlook had some tendency to underestimate economic growth, and temporary economic measures had been formulated and implemented when necessary. During the high-growth period in postwar Japan, in particular in the 1950s-60s, one of the most difficult targets to achieve was balance of payments. When the economy was in boom and overheated, imports expanded according to GDP/GNP and balance of payment turned negative. Under the Bretton-Woods regime, the fixed exchange system had been adopted and the government had been obligated to maintain an adjustable peg system. This was called the ceiling of balance of payment to constrain the Japanese economic growth until mid-1960s⁷⁷. Table 12-3 describes temporary economic policy measures during foreign exchange crisis in 1957-58.

Table 12-3: Economic Policy Measures During Foreign Exchange Crisis in 1957-58

	date	policy measures
tightening	1956.7.17	Tightening the window guidance (Bank of Japan)
	1957.3.20	Official discount rate rose from 7.30% to 7.67% (Bank of Japan)
	1957.5.8	Official discount rate rose from 7.67% to 8.40% (Bank of Japan)
		Announcement of withdrawal of foreign deposit (Government)
	1957.5.14	Shortening of the duration of Pound Sterling import usage from four months to

⁷⁷ See Figure 13-1 in the next chapter.

		three and 20 percent reduction of import usage application (Government)
	1957.6.1	Administrative guidance to moderate import L/C (Government)
	1957.6.4	Pull-up of import guarantee rate (Government)
	1957.6.19	Comprehensive measures to improve balance of payments (Government)
	1957.6.20	Pull-up of import guarantee rate (Government)
	1957.6.28	Deferment of 8% of infrastructure investments (Government)
loosening	1958.5.1	Pull-down of import guarantee rate (Government)
	1958.6.18	Official discount rate reduced from 8.40% to 7.67% (Bank of Japan)
	1958.9.5	Official discount rate reduced from 7.67% to 7.30% (Bank of Japan)
	1959.2.19	Official discount rate reduced from 7.30% to 6.94% (Bank of Japan)
	1959.4.1	Expansion of import usage application (Government)

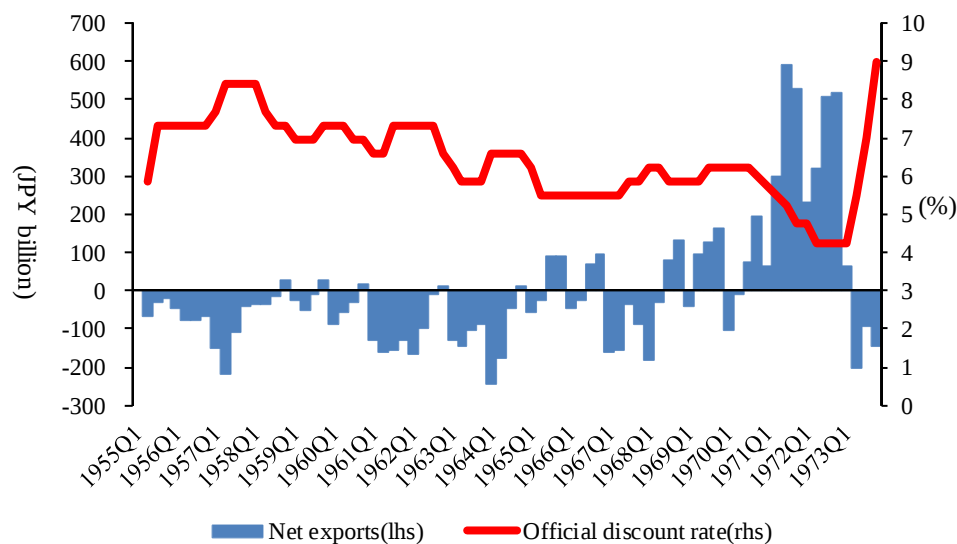
Source: Asai(2015) p.231.

One of the most remarkable features of the measures taken at the above-mentioned occasion was that for monetary policy, in particular, interest rate manipulation was assigned to the target of exchange rate level for the first time. Of course, more direct and brutal import-curbing measures were also applied to reduce imports, including withdrawal of foreign deposits and pull-up of import guarantee rate. After the bubble burst in the early 1990s, however, a lot of temporary economic expanding measures were formulated and implemented to boost the Japanese economy.

13. Policy Coordination Utilizing Economic Analysis Report

While dealing with long- and short-term economic policy coordination, the economic policy authorities of Japanese government during high-growth period also issued an annual economic report, sometimes called “Economic White Paper.” This report was first published in 1947, immediately after the end of World War II. According to EPA (1972), the report of 1948 evaluated the effect of the priority production system, those of 1949 and 1950 analyzed the stabilization process after the war, and that of 1951 focused on the economic impact of the Korean War.

Figure 13-1: Balance of Payments and Official Discount Rate



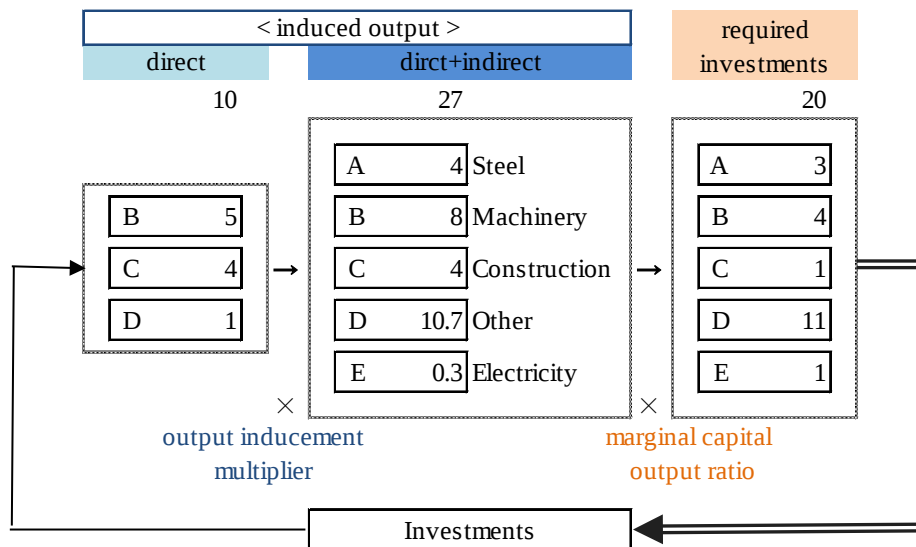
Source: Bank of Japan and Ministry of Finance.

Note: Mr. Koji Sago of ESRI, CAO has kindly assisted with this chart.

Economic White Paper of FY 1962 points out three features of the Japanese business cycle during the high growth period⁷⁸: (1) economic fluctuation is quite large; (2) worsening of the balance of payments triggered monetary tightening that led to contraction; and (3) the inventory stock fluctuation was the main factor of the business cycle. As above Figure 13-1 reports inverse correlation between deficit in balance of payment and interest rate, the ceiling of the balance of payment was regarded as one of the highest obstacle to be overcome. When the economic boom brought the deficit in balance of payment, the government (Bank of Japan) had to tighten monetary policy to maintain the fixed exchange rate and not to come down to the foreign currency shortage under the Bretton-Woods regime. After the foreign exchange crisis in 1957-58 focused on at the former section, the Economic White Paper of 1964 analyzed the relationship between the economic expansion and the balance of payments as follows: The economic expansion in the previous year had been more than expected, which resulted in overtaking the prewar economic level recorded in 1934-36 for the first time. Compared with the prewar level, industrial production increased by 60 percent, and national income rose by 30 percent. Exports, however, did not grow so much and resulted in \$1.3 billion that was less than the planned \$1.6 billion and imports expanded close to \$2.6 billion due to the economic boom. The Economic White Paper of this year pointed out that the deficits of balance of payments originated from expansion of consumption, both macroeconomic expansion of consumption in quantity and microeconomic consumption shift in quality from essential goods to luxury goods.

⁷⁸ EPA (1972) p.187.

Figure 13-2: Mechanism of Investment Inducing Investment



Source: Figure I-1-2, *Economic White Paper FY1961*, p.293, Economic Planning Agency.

One of the most important factors contributing to the high growth in postwar Japan was a rapid increase of investment, which was called “Investment Inducing Investment” process in *Economic White Paper FY1961*, from which the above Figure 13-2 was quoted, to depict the process employing the method of the input-output table as follows:

- (1) Independent increase of investment, 10 units, will be distributed to machinery industry B of 5 units, to construction industry C of 4 units, and to other industries D of 1 unit at the left column;
- (2) According to the output inducement multiplier, these direct effects in demand will induce another indirect output of 17 units, therefore in total of direct and indirect output increase will size up to 27 units that are distributed to above Figure 13-2 at the center column;
- (3) According to the marginal capital-output ratio, the required investment will add up to 20 units equivalent with output of 27 units at the right column; and
- (4) As independent demand, the above increase of investment of 20 units will originate another cycle of the Investment-Inducing-Investment process.

Table 13-1: Growth of GNP, Investment and Consumption in Main Countries (unit: percent)

	GNP Growth	Growth of Private Investment	Growth of Private Consumption
West Germany	6.7	9.6	6.7
Italy	5.5	8.1	3.7
France	4.1	7.0	3.6

Netherlands	6.2	5.8	4.7
United Kingdom	2.4	5.2	3.0
United States	2.5	1.9	3.5
Canada	3.5	2.4	4.3
Ceylon	3.3	11.8	3.5
Philippines	4.9	9.8	4.4
Taiwan	6.8	5.6	7.1
Australia	6.8	8.1	7.2
Japan	9.7	29.4	6.8

Source: Figure I-1-4, *Economic White Paper FY1961*, p.291, Economic Planning Agency.

Note: Figures are mainly of average growth rate during 1953-59 including some exceptional figures due to data availability. Addresses of country names are subject to those in FY1961.

Table 13-1 is also quoted from *Economic White Paper FY1961* and reports growth rate of GNP, private investment, and private consumption in main countries. During this period, Japan experienced a high growth in GNP/GDP, investment, and consumption; among those, growth of investment was extremely high by international comparison. This high-growth investment had supported the Japanese economy from both demand- and supply-side during the high-growth period.

Table 13-2 reports the subtitles of each issue of the *Economic White Paper*, which indicate the most impressive and important economic topics in each year during the high-growth period. Among those, it is suggested that one of the most required targets of government authorities is to catch up to developed countries by growing the economy. Among those, Kiyosawa (2003, p.28) insists that the *Economic White Paper FY1957* focused on the small- and medium-sized enterprises as one of the most delayed modernized sectors that brought stagnated employment situation; this analysis had had sizable effects on the legislation of the Small and Medium Enterprises Basic Act in 1963.

Table 13-2: Subtitle of Economic White Papers during High-Growth Period

	Subtitle
FY1955	Road to Progress
FY1956	Growth and Modernization of Japanese Economy
FY1957	Too Rapid Expansion and Correspondence to It
FY1958	Revival of Business Cycle
FY1959	Rapid Recovery and Challenges for the Future
FY1960	Growth Power and Competitiveness of Japanese Economy
FY1961	Challenge for Growing Economy

FY1962	Transfiguration of Business Cycle
FY1963	Road to Developed Country
FY1964	Japanese Economy under the Open Regime
FY1965	Challenges for Stable Growth
FY1966	Road to Sustainable Growth
FY1967	Improvement of Efficiency and Welfare
FY1968	Japanese Economy in the Globalization
FY1969	Challenges for Affluence
FY1970	New Dimension of Japanese Economy

Source: EPA (1972) pp.725-53.

In addition to annual economic reports, the government of Japan has started issuing the Monthly Economic Report from April 1958⁷⁹, which has been announced at the ministerial level meeting consisting of the Prime Minister, related Ministers, and the Governor of the Bank of Japan. This monthly report aimed to figure out the government's assessment of the state of the economies by analyzing the trends of Japanese and overseas economies; it has long been accepted as a basic information package on the economy by both government sector for policy formulation and by the private sector for business planning. More statistically, the Indexes of Business Conditions have been compiled and issued from August 1960⁸⁰. This indicator has been derived by integrating statistics of production, employment, consumption, and various other key indicators that are sensitive to change economic activities. This index had been first designed as a diffusion index (DI) that indicates only the directions of business cycle, i.e., expansion or contraction. From April 2008, the government of Japan has officially adopted a composite index (CI) that does not only indicate the direction but also measures the tempo and the magnitude or the volume of economic fluctuations. More detailed information on the Indexes of Business Conditions are provided in Appendix 2, along with the estimation methodology of a stochastic business indicator reported in Stock and Watson (1989, 1990).

14. Conclusion

The Japanese economy had experienced unprecedented high economic growth in the 1950s-60s, which had been supported by a variety of factors. Among those, both adequate economic policies of the government and active *animal spirits* of entrepreneurs were important, along with healthy consumer spending. In particular, Japanese economic policy was managed according to economic plans and the *animal spirit* had resulted in a large investment, which was called the “Investment Inducing Investment” process. On the other hand, at present, some developing countries are at the gate

⁷⁹ EPA (1972) p.356.

⁸⁰ EPA (1972) p.356.

of a fruitful era if adequate growth can be achieved.

This study mainly aims to reveal the role of the economic plans during the high growth period in postwar Japan. For another purpose, however, it is able to describe some lessons from Japanese postwar experiences on economic plans for developing countries. Hopefully, this study reveals both theoretical and practical aspects of Japanese economic planning exercises in the postwar high-growth period, and contributes to favorable economic environment in developing countries. Since policy resources are more limited and scarce in developing countries than in developed nations, economic policy coordination is more difficult but important in developing countries. In the high growth period, Japan had been one of them, and this study's focus on economic plans in Japan could contribute to economic development in some countries.

The basic knowledge relating to economic planning that this study focuses on is helpful for the current and expected future leaders who are or will be in charge of government public policies. Not only for government leaders but also for current and future private firms’ executives, this study provides systematic and practical basic knowledge about a variety of economic policies and policy coordination process and methods. In particular, in a practical level of economic plans and policy coordination exercises utilizing short-term policy coordination tools and annual and monthly economic reports will be helpful for both the public and private sectors.

(references)

- Aghion, Philippe and Rachel Griffith (2005) *Competition and Growth: Reconciling Theory and Evidence*, 2005, MIT Press.
- Amsden, Alice H. (1989) *Asia’s Next Giant*, Oxford University Press, 1989.
- Aoki, Masahiko (1981) “Re-thinking the Role of Economic Planning,” Yasusuke Murakami and Koichi Hamada eds. *New Trend in Economics*, Toyo Keizai, 1981 [in Japanese, 「経済計画の機能再考」『経済学の新しい流れ』].
- Asai, Yoshio (2000) “*New Long-Range Economic Plan*” and *Economic and Industrial Policy in Early High-Growth Period*, Institute for Economic Studies, Seijo University, March 2000 [in Japanese, 『「新長期経済計画」と高度成長初期の経済・産業政策』].
- Asai, Yoshio (2010) “Rapid-Growth and Fiscal and Monetary Policy,” Ishii, Kanji, Akira Hara, and Haruhiko Takeda eds. *Socio-Economic History of Modern Japan, Vol.5: The Years of Rapid Growth*, University of Tokyo Press, 2010 [in Japanese, 『日本経済史 5 : 高度成長期』].
- Asai, Yoshio (2015) *Transition to Article 8 Nation of the IMF – Political Economy of Liberalization of Trade and Foreign Exchange*, Nihon Keizai Hyoron Sha, August 2015 [in Japanese, 『IMF8 条国移行 - 貿易・為替自由化の政治経済学』].

- Blanchard, Oliver Jean and Stanley Fisher (1989) *Lectures on Macroeconomics* (Cambridge, Mass.: MIT Press).
- CAO (2007) *Japanese Economy 2007-2008*, Cabinet Office.
- Colm, Gerhard (1952) *The American Economy in 1960*, Planning Pamphlets No.81, National Planning Association, Washington.
- Dorfman, Robert, Paul Samuelson, and Robert Solow (1958) *Linear programming and economic analysis*, McGraw-Hill.
- Economic Council (1983) *Japan in the Year 2000*, Long Term Outlook Committee, Economic Council, Japan Times.
- EPA (1962) *Annual Economic Report*, Economic Planning Agency, July 1962 [in Japanese, 「昭和37年度 経済白書」].
- EPA (1972) *Documents 25 Years of Economic White Paper*, May 1972, Research Bureau, Economic Planning Agency, Nihon Keizai Shimbun Sha [in Japanese, 『資料経済白書 25年』].
- EPA ed. (1976) *Evolution of Contemporary Economy in Japan: Thirty-Year History of the Economic Planning Agency*, Economic Planning Agency, August 1976 [in Japanese, 『現代日本経済の展開: 経済企画庁 30年史』].
- EPA (1984) *Multi-Sectoral Economic Models for Medium and Long Term Analysis, Summary of the Seventh Report of the Committee for Econometric Model Analysis*, Economic Planning Agency, 1984.
- EPA ed. (1997) *Trajectory of Postwar Economy in Japan: Fifty-Year History of the Economic Planning Agency*, Economic Planning Agency, March 1997 [in Japanese, 『戦後日本経済の軌跡: 経済企画庁 50年史』].
- Flath, David (2005) *The Japanese Economy*, 2nd edition, Oxford University Press, 2005.
- Furuya, Kenichi (1979) *Trajectory of Growth*, Nihon Keizai Shinbun Sha, May 1979 [in Japanese, 『成長の軌跡』].
- Harada, Yutaka and Shinji Yoshioka (2004) “Why Did Japan’s Economic Growth Rate Decrease in the 1970s?” *ESRI Discussion Paper Series No.119*, October 2004 [in Japanese, 「日本の実質経済成長率は、なぜ1970年代に屈折したのか」].
- Harris, John R. and Michael P. Todaro (1970) “Migration, Unemployment and Development: A Two-Sector Analysis,” *American Economic Review* 60(1), March 1970, pp. 126-42.
- Haruta, Hisayoshi (1980) “Economic Plans in Japan,” *Operations Research* 25(5), May 1980, pp.278-84 [in Japanese, 「日本の経済計画」、『オペレーションズ・リサーチ』第25巻第5号]
 On open access at http://www.orsj.or.jp/~archive/pdf/bul/Vol.25_05_278.pdf
 (accessed on June 30, 2016).
- Hayashi, Yujiro ed. (1997) *Economic Plans in Japan*, Nihon Keizai Hyoron Sha, 1997 [in Japanese, 『日本の経済計画』].
- Hashimoto, Juro, Shin Hasegawa, Hideaki Miyajima, and Nao Saito eds., (2011) *Contemporary Japanese Economy*, 3rd edition, Yuhikaku, June 2011 [in Japanese, 『現代日本経済 第3版』].

- Hoshino, Shinyasu (2003) *Economic Plans as Politics*, Nihon Keizai Hyoron Sha, 2003 [in Japanese, 『政治としての経済計画』].
- Inoki, Takenori (1989) “Growth Trajectory (1),” Yasukichi Yasuba and Takenori Inoki eds. *High Growth*, Iwanami-shoten [in Japanese, 「成長の軌跡（１）」『高度成長』], pp. 264-276.
- Jahan, Sarwat (2012) “Inflation Targeting: Holding the Line,” *Finance & Development Back to Basics*, IMF. On open access at <http://www.imf.org/external/pubs/ft/fandd/basics/target.htm> (accessed on June 30, 2016).
- Johnson, Chalmers (1982) *MITI and the Japanese Miracle*, Stanford University Press, 1982.
- Kaiduka, Keimei (1973) *Challenges of Economic Policy*, 1973, Tokyo University Press [in Japanese, 『経済政策の課題』].
- Kanamori, Hisao and Takashi Omori eds. (2016) *Reading on Japanese Economy, 20th Edition*, Toyo Keizai, March 2016 [in Japanese, 『日本経済読本 第20版』].
- Kiyosawa, Tatsuo (2003) “The Two-tiered Structure of Management in Japan,” *Journal of Seigakuin University* 16(1), November 2003, pp.27-43 [in Japanese, 清澤達夫「経営の二重構造を考える」、『聖学院大学論叢』第16巻第1号].
- Kohama, Hirohisa and Machiko Watanabe (1996) *Economic Development in Postwar Japan*, Nihon Hyoron Sha, September 1996 [in Japanese, 『戦後日本経済の50年』].
- Komine, Takao (1993) “Role of Economic Plan in Japan,” Kosai, Yutaka and Juro Teranishi eds. *The Japanese Experience of Economic Reforms*, St. Martin’s Press, pp.255-274.
- Komiya, Ryutaro (1975) *Study in Contemporary Japanese Economy*, Tokyo University Press, 1975 [in Japanese 『現代日本経済研究』].
- Komiya, Ryutaro, Masahiro Okuno, and Kotaro Suzumura eds., (1984) *Industrial Policy in Japan*, Tokyo University Press, December 1984 [in Japanese, 『日本の産業政策』].
- Komiya, Ryutaro (1988) *Japanese Contemporary Economy: Macro Development and Relationship with International Economy*, Tokyo University Press, November 1988 [in Japanese, 『現代日本経済: マクロ的展開と国際経済関係』].
- Kosai, Yutaka (1980) *Age of High-Growth*, Nihon Hyoron Sha, 1980 [in Japanese, 『高度成長の時代』].
- Kosai, Yutaka and Juro Teranishi eds., (1993) *Economic Reforms in Postwar Japan: Market and Government*, Tokyo University Press, June 1993 [in Japanese, 『戦後日本の経済改革: 市場と政府』].
- Krugman, Paul R. (1994) *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s, revised and updated edition*, MIT Press, 1994.
- Ladner, Roy (1961) “Paths of Economic Growth that are Optimal with regard only to Final States,” *Review of Economic Studies* 28(1), February 1961, pp. 98-104.
- Lucas, Robert E. (1976) “Econometric Policy Evaluation: A Critique,” *Carnegie-Rochester Conference Series on Public Policy* 1, January 1976, pp. 19-46.
- McKenzie, L. W. (1963) “Turnpike Theorem for Generalized Leontief Model,” *Econometrica* 31(1-

- 2), January-April 1963, pp.165-80.
- Mikuriya, Takashi (1989) “Postwar Democratization and Comprehensive Development Plan,” Takafusa Nakamura ed. *Planning and Democratization*, Iwanami-shoten [in Japanese, 「戦後民主化と国土計画」『「計画化」と「民主化」』], pp. 264-276.
- Miwa, Yoshiro (1996) *Firms and Industrial Organization in Japan*, Macmillan, 1996.
- Miwa, Ryoichi and Akira Hara, eds. (2010) *Handbook on Modern and Contemporary Japanese Economic History*, 2010, Tokyo University Press [in Japanese, 「近現代日本経済史要覧」].
- Moriguchi, Chiaki (2013) “Japanese Model of Workforce Management and High Growth”, *The Japanese Journal of Labour Studies*, No.634, May 2013, pp.52-63 [in Japanese, 「日本型人事管理モデルと高度成長」、『日本労働研究雑誌』]
- Morishima, Michio (1961) “Proof of a Turnpike Theorem: the No Joint Production Case,” *Review of Economic Studies* 28(1), February 1961, pp. 89-97.
- Naoi, Megumi and Tetsuji Okazaki (2013) “Political Economy of Trade Liberalization: The case of postwar Japan,” *RIETI Discussion Paper Series 13-E-090*, Research Institute of Economy, Trade and Industry, November 2013.
 On open access at <http://www.rieti.go.jp/jp/publications/dp/13e090.pdf>
 (accessed on June 30, 2016).
- Nawata, Yasumitsu (2008) “Population Migration and Economic Growth in Postwar Japan,” *Economic Prism* 54, House of Councillors, the National Diet of Japan, May 2008, pp. 20-37 [in Japanese, 「戦後日本の人口移動と経済成長」、『経済のプリズム』].
- Nishimura, Yoshimasa (1994) *Fiscal and Monetary policies of Japan in the Reconstruction and High-Growth*, Institute of Fiscal and Monetary Policy, Ministry of Finance, 1994 [in Japanese, 「復興と成長の財政金融政策」].
- Lewis, W. Arthur (1954) “Economic Development with Unlimited Supply of Labor,” *The Manchester School of Economic and Social Studies* 22(2), May 1954, pp. 139-91; reprinted in A. N. Agarwala and S. P. Singh (eds.) *The Economics of Underdevelopment*, Oxford University Press, 1963.
- Ohkita, Yoichi (2010) *Economy of Postwar Japan*, Toyo Keizai, 2010 [in Japanese, 「戦後日本経済論」].
- Ohno, Kenichi (2006) *Economic Development of Japan: The Path Traveled by Japan as a Developing Country*, 2006, GRIPS Development Forum. On open access at <http://www.grips.ac.jp/forum/pdf06/EDJ.pdf> (accessed on June 30, 2016).
- Okazaki, Tetsuji (1998) “Industrial Policy and Government Organization in Postwar Japan,” *Tokyo University Discussion Paper CIRJE-J-2*, July 1998 [in Japanese, 「戦後日本の産業政策と政府組織」]. On open access at <http://www.cirje.e.u-tokyo.ac.jp/research/dp/98/cj2/dp.pdf>
 (accessed on June 30, 2016).
- Ramsey, Frank P. (1928) “A Mathematical Theory of Saving,” *Economic Journal* 38(152), December 1928, pp. 543-59.

- Rostow, W. W. (1960) *The Stages of Economic Growth: A Non-Communist Manifesto*, Cambridge University Press, 1960; in particular, Chapter 2: “The Five Stages of Growth - A Summary,” pp. 4-16.
- Sadahiro, Akira (1991) “The Japanese Economy during the Era of High Economic Growth,” *Working Paper No. 4*, Department of Research Cooperation, Economic Research Institute, Economic Planning Agency, July 1991. On open access at <http://www.esri.go.jp/jp/archive/wor/wor004/wor004.pdf> (accessed on June 30, 2016).
- Sadahiro, Akira (1992) “Possible Lesson for the Transition to a Market Economy and Durable Economic Growth with the Reference to the Postwar Japanese Economy,” *Working Paper No. 8*, Department of Research Cooperation, Economic Research Institute, Economic Planning Agency, April 1992. On open access at <http://www.esri.go.jp/jp/archive/wor/wor008/wor008.pdf> (accessed on June 30, 2016).
- Sato, Kazuo (1990) “Indicative Planning in Japan,” *Journal of Comparative Economics* 14(4), December 1990, pp. 625-47. On open access at http://ac.els-cdn.com/014759679090044A/1-s2.0-014759679090044A-main.pdf?_tid=e314c062-0b51-11e6-bb25-0000aacb35e&acdnat=1461635881_7605b0f26b55b4aa3c93036f26770bf5 (accessed on June 30, 2016).
- Shishido, Shuntaro (1965) “Japanese Experience with Long-Term Economic Planning,” *Quantitative Planning of Economic Policy*, Brooking Institution, pp. 212-232.
- Stock, James H. and Mark W. Watson (1989) “New Indexes of coincident and leading economic indicator,” *NBER Macroeconomic Annual* 4, 1989, pp. 351-409
- Stock, James H. and Mark W. Watson (1990) “A Probability Model of the Coincident Economic Indicators,” Lahiri, Kajal and Geoffrey H. Moore eds., *Leading Economic Indicators: New Approaches and Forecasting Records*, Chapter 4, Cambridge University Press, 1990, pp. 63-89.
- Tada, Hidenori (2011) “Establishment of Universal Coverage of Pension and Health Insurance in Japan,” *The Quarterly of Social Security Research*, Vol. 47 No. 3, pp. 220-230 [in Japanese, 「福祉国家と国民皆保険・皆年金体制の確立」、『季刊・社会保障研究』].
- Takeda, Haruhito (2014) *Decoding the “National Income Doubling Plan”*, Nihon Keizai Hyoron Sha, 2014 [in Japanese, 『「国民所得倍增計画」を読み解く』].
- Tatemoto, Masahiro, Tadao Uchida and Tsunehiko Watanabe (1967) “A Stabilization Model for the Postwar Japanese Economy: 1954-62,” *International Economic Review*, Vol. 8, No. 1, pp. 13-44.
- Teranishi, Juro (1993) “Financial Sector Reform after the War,” Kosai, Yutaka and Juro Teranishi eds. *The Japanese Experience of Economic Reforms*, St. Martin’s Press, pp. 153-177
- Tsukui, Jinkichi (1966) “Turnpike Theorem in a Generalized Dynamic Input-Output System,” *Econometrica* 34(2), April 1966, pp. 396-407.
- Tsukui, Jinkichi (1968) “Application of a Turnpike Theorem to Planning for Efficient Accumulation:

- An Example for Japan,” *Econometrica* 36(1), January 1968, pp. 172-86.
- Tsuruta, Toshimasa (1982) *Industrial Policy in Postwar Japan*, Nihon Keizai Shinbun Sha, February 1982 [in Japanese, 『戦後日本の産業政策』].
- Toshida, Seiichi ed. (2001) *Ups and Downs of Post-War Japanese Economy Based on the Economic Report*, Yuhikaku, October 2001 [in Japanese, 『経済白書で読む戦後日本経済の歩み』]
- von Neumann, John (1945) “A Model of General Economic Equilibrium,” *Review of Economic Studies* 13(1), 1945, pp. 1-9.
- Wade, Robert (1990) *Governing the Market: Economic Theory and the Role of the Government in East Asian Industrialization*, Princeton University Press, 1990.
- Watanabe, Tsunehiko (1965) “National Planning and Economic Growth in Japan,” *Quantitative Planning of Economic Policy*, Brookings Institution, pp. 233-251.
- World Bank (1993) *The East Asian Miracle: Economic Growth and Public Policy*, World Bank, Oxford University Press, September 1993.
- Yonekura, Seiichiro (1993) “Postwar Reform in Management and Labour”, Kosai, Yutaka and Juro Teranishi eds. *The Japanese Experience of Economic Reforms*, St. Martin’s Press, pp. 205-238.
- Yoshikawa, Hiroshi (1992) *Japanese Economy and Macroeconomics*, Toyo Keizai, 1992 [in Japanese, 『日本経済とマクロ経済学』].
- Yoshikawa, Hiroshi (2012) *High-Growth*, Chuko Bunko, 2012 [in Japanese, 『高度成長』].
- Yoshioka, Shinji (1998) “Short-Term Economic Forecast in Japan,” *Series B. No. 20*, Economic Planning Agency, January 1998.

Appendix 1: Modern Economic Growth Theory and Development Economics

Ohkita (2010, chapter 3) surveys and summarizes several reviews on factors of high growth in postwar Japan as follows:

- (1) Patric and Rosovski (1976), in particular in Chapter 1, stress economic factors while other studies focus on Japanese uniqueness in government policy, labor practices, or cultural differences from Western economies and societies;
- (2) Kosai and Ogino (1980) regard Japanese high growth during this period as the catch-up process to advanced countries, therefore it is a one-time event;
- (3) Ohkawa and Rosovski (1973) take much notice of upward swing of Kuznets cycle and some unutilized factors such as technology and excess labor, and delay of wage increase that allowed rapid expansion of both profit and wage; and
- (4) Minami (1970) puts importance on the backwardness of Japan's economy, which accelerated economic growth in the early stages of development.

From the viewpoint of the practical aspect of economic plan exercises, simplified growth models are sometimes assumed and employed, including the Harrod-Domar model (Harrod 1939 and Domar 1946), the neoclassical Solow-Swan model (Solow 1956 and Swan 1956), the AK model (Romer 1986) and other endogenous growth model (Romer 1994), and so on. Paying attention to above reviews on Japan's high growth, this appendix deals with some growth theories and other theoretical background, including growth account (Solow 1957), growth convergence (Barro 1991, and Barro and Sala-i-Martin 1991 and 1992), and others.

The Harrod-Domar growth model is often regarded as a dynamic version of Keynesian macroeconomic theory and treats the investment in a dual aspect, such as demand in the short run and production factor in the long run. The model thus starts as follows:

(EQ 1) GDP component under balanced budget

$$Y = C + I + T$$

$$C = c(Y - T) = c(1 - t)Y \quad \text{or}$$

$$S = I = s(Y - T) = s(1 - t)Y \quad \text{i.e.,} \quad c + s = 1$$

$$T = tY$$

where	Y	GDP
	C	consumption
	I	investment
	T	government expenditure (identical to tax revenue)
	c	average and marginal propensity to consume
	S	savings

s average and marginal propensity to save
 t average and marginal tax rate

(EQ 2) Introducing capital stock assuming fixed capital coefficient
 (increment of capital stock is identical to investment)

$$K = \lambda Y \quad \text{or} \quad \lambda \equiv \frac{K}{Y}$$

$$I = \Delta K = \lambda \Delta Y$$

where K capital stock
 λ capital coefficient
 Δ increment symbol

(EQ 3) Growth rate expression

$$G = \frac{\Delta Y}{Y} = \frac{I/\lambda}{Y} = \frac{s(1-t)Y/\lambda}{Y} = \frac{s(1-t)}{\lambda}$$

where G growth rate

According to the Harrod-Domar growth model under some simplified assumption including fixed capital coefficient and balanced budget at the government, the growth rate is subject to savings rate. For developing countries, therefore, the higher the saving rate is, the higher the growth rate. Ohkita (2010, p.69, Table 3-3) reports the following statistics that depict growth rate, capital coefficient, and savings rate in Japan during the high growth period from 1951-76.

Table A1-1: Growth Rate, Capital Coefficient, and Saving Rate in Japan

	1951-56	1956-61	1961-66	1966-71	1971-76
growth rate	7.8%	10.1%	9.2%	10.9%	5.0%
capital coefficient	2.8	2.9	3.4	3.2	6.5
savings rate	28.0%	29.6%	31.8%	34.4%	32.6%

Source: Ohkita (2010) p.69 Table 3-3.

Many studies reveal that the equilibrium of this model is not stable, and call it a "knife-edge equilibrium." Above growth rate G in the Harrod-Domar model is a very important key rate variable because it will cancel both excess supply and demand and clear the goods market. This growth rate G also in general called the warranted growth rate (GW) and introducing labor and labor growth, we obtain the natural rate of growth (GN) as follows:

(EQ 4) Warranted growth rate and natural rate of growth

$$GW = \frac{s(1-t)}{\lambda}$$

$$GN = \frac{\Delta L}{L} \equiv n$$

where L worker or labor engaged in work

Repeatedly, these three types of growth rates such as the actual growth rate, the warranted growth rate, and the natural growth rate are not necessarily identical. And these rates are developed to the growth account.

Utilizing the same notation as the Harrod-Domar theory, the neoclassical Solow-Swan growth model introduces the linear homogenous production function under the assumption of constant depreciation and diminishing returns to scale, representing a steady state of growth, as follows:

(EQ 5) Production function

$$Y = F(K, L) \quad \text{or} \quad y = f(k)$$

where F production function for output (GDP)
 f production function for output (GDP) per worker
 y output (GDP) per worker i.e., $y \equiv Y/L$
 k capital stock per worker (or capital equipment ratio)
 i.e., $k \equiv K/L$

(EQ 6) Representation of steady state of growth

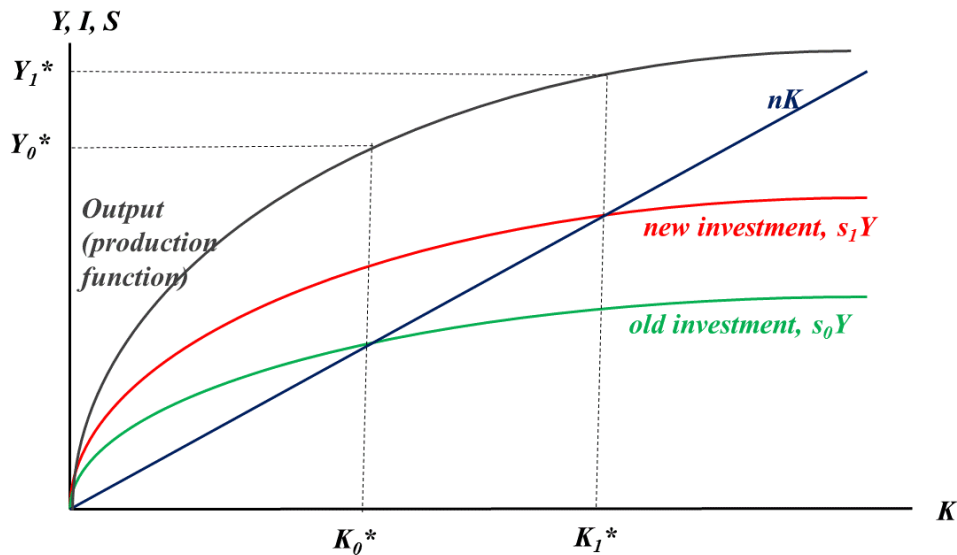
$$\Delta k = sf(k) - nk$$

The Solow diagram is drafted according to above Solow equation, with the vertical axis of output and investment (=savings) Y, I and S and the horizontal axis of capital stock K . The nK line means so-called break-even line and represents the equilibrium level of output and investment that are linear because of the constant returns of scale in the production function. The gray curve represents the output subject to the production function. And the green line depicts the initial (or old) investment while the red does the shifted (or new) investment after the savings rate rises. These three curves--green, red, and gray--are upward convex or positive in the first derivative but negative in the second due to the assumption of the diminishing returns of scale. K_0^* and Y_0^* are equilibria of the output and capital stock before the savings rate hike. Certainly, K_1^* and Y_1^* are those after the savings rate change. Without a savings rate change, however, these equilibria are stable⁸¹ since the capital stock position at the left-side of the equilibrium forces net increase of capital stock of positive investment, and *vice versa*, the capital curve underscoring the nK line implies negative investment. Both K_0^* and Y_0^* pair

⁸¹ This stability of the equilibrium of Solow-Swan model is one of the most drastic changes compared with the knife-edge equilibrium of the Harrod-Domar theory.

and that of K_1^* and Y_1^* are regarded as the steady state of correspondent saving rates. Therefore, the Solow-Sean growth theory also supposes that the high savings rate results in high growth, as does the Harrod-Domar model. Figure A1-1 reports the diagram:

Figure A1-1: Solow Diagram



Source: Authors based on Acemoglu (2009) p.50 Figure 2.8.

If the neoclassical Solow-Swan growth theory holds, the output *per capita*, i.e., y or Y/L with notation here, would converge to a certain level. Developing countries of low *per capita* GDP have considerable chances to grow faster while the growth rates in developed countries are not necessarily so high or even low, which means convergence in growth. This convergence theory is empirically explored, e.g., by Barro and Sala-i-Martin (1991, 1992). And some economists consider that the rapid growth in emerging and developing countries observed in the actual world economy implies this convergence theory.

An AK model is regarded as one of the simplest and most easily handled models in the endogenous growth theory⁸². While both the Harrod-Domar model and the Solow-Swan model are widely used as baseline models of economic growth, it is still considered by many economists to be unsatisfactory as a description of the process leading to economic growth or development. This is because the model views improvements in total factor productivity or technological progress to be an important source of growth in output per worker, but does not provide an explanation as to where these improvements come from. The endogenous growth theory therefore begins with a simple AK model containing a

⁸² Acemoglu (2009) focuses on the AK model as one of the simplest and the first-generation models of endogenous growth (p.388, chapter 11).

linear production function, depending on the capital stock as follows using the same notation as before:

(EQ 7) Production function

$$Y = AK \quad \text{or} \quad y = Ak$$

where A productivity parameter standing for technology or efficiency

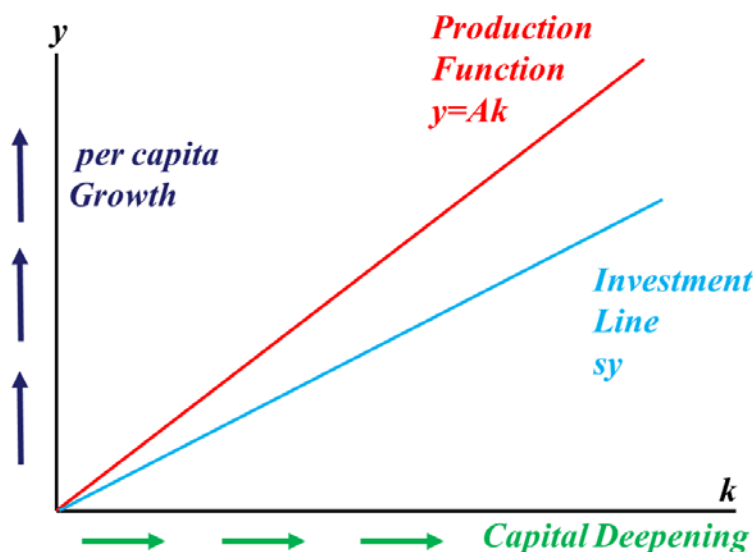
(EQ 8) Endogenous growth rate

$$\Delta Y = A\Delta K = AI = AsY \quad \text{then}$$

$$\frac{\Delta Y}{Y} = As \quad \text{or} \quad \frac{\Delta y}{y} = As - n$$

The AK model suggests that the growth depends on both savings rate and productivity. The final two equations that declare the growth rate and *per capita* growth rate state that the output grows linearly with the savings rate and productivity and that *per capita* growth rises with the same two factors and declines with labor (or population) increase. Since this AK model does not assume the diminishing returns of scale but constant returns, the capital deepening indicated with capital equipment ratio and technological progress lead long-run growth. Rebelo (1991) insists that one of the most drastic changes of the AK model from Solow-Swan model is that the exogenous parameters alter the long run growth rate of *per capita* output rather than the level of *per capita* output. And also, this theory does not imply the convergence of the growth at all. The following Figure A1-2 depicts the AK model diagram⁸³.

Figure A1-2: AK Model Diagram



Source: Authors.

⁸³ The investment is also represented by the break-even line in the Solow-Swan model.

Based on Barro (1991, 1998), the above-mentioned growth models result in the growth accounting approach, which aims to reveal the decisive factors for growth. First of all, we have to include productivity or technological progress in (EQ 5), assuming a Cobb-Douglas production function and employing the same notation, we obtain a new production function as follows:

(EQ 9) Production function with productivity

$$Y = AK^{\alpha}L^{1-\alpha}$$

where α parameter representing capital share

Differentiating (EQ 9) with respect to time, we obtain the basic growth accounting formula as follows:

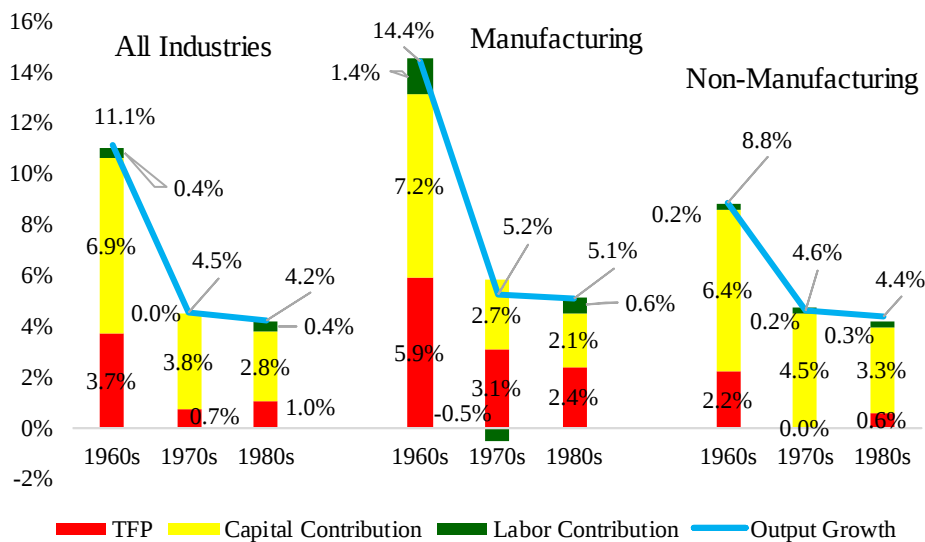
(EQ 10) Growth accounting

$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta L}{L}$$

Above (EQ 10) of basic growth accounting suggests that three types of decisive factors for growth are observed as follows:

- (1) Productivity growth, called total factor productivity (TFP);
- (2) Capital stock accumulation; and
- (3) Increase of workers (or labors)

Figure A1-3: Growth Accounting in Postwar Japan



Source: Yoshikawa (1999) p.232 Figure 2.

Figure A1-3 depicts growth accounting in postwar Japan from the 1960s to 1990s. Senhadj (2000) applies this growth accounting methodology to a lot of worldwide countries while Cetto et al. (2009) applies it to main advanced countries such as France, Japan, the United Kingdom and the United States for the long term, since 1890. Among these studies, Cetto et al. (2009) p. 31 Table 2 reveals that the total factor productivity in Japan during 1950-73 is the largest among reported advanced countries in the table.

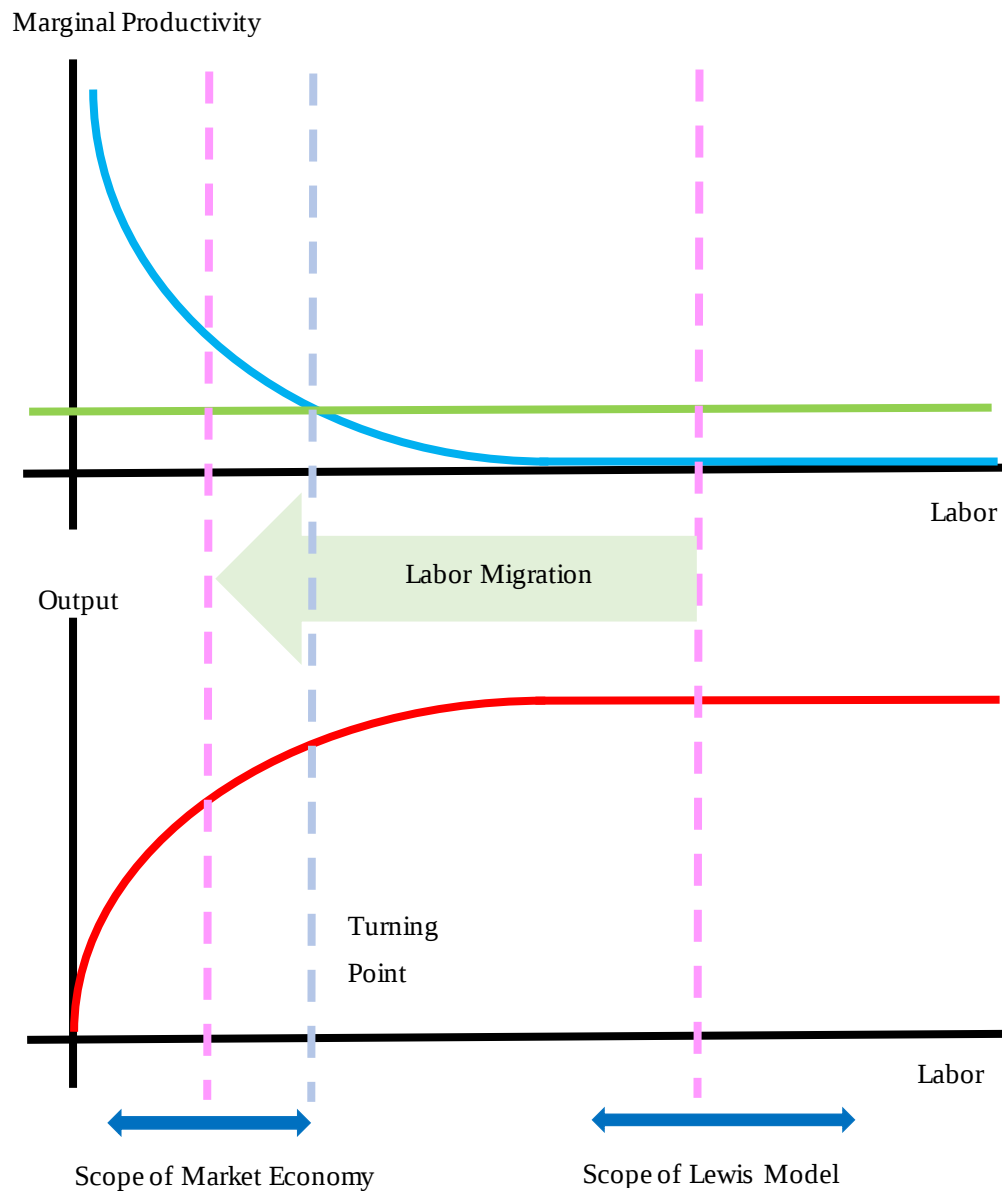
Apart from above-mentioned standard modern growth theory that can be applied for both developed and developing countries, we have recognized for a long time that a developing economy contains a very important issue of the dual economy, consisting of two sectors such as capitalist and subsistence sectors. According to Lewis (1954), Yoshioka (2003) summarizes some features of both sectors as follows:

- (1) At the capitalist sector, the wage rate is set equal to marginal productivity of labor. On the other hand, at the subsistence sector, it is set equal to subsistence level while marginal productivity of labor is nearly zero;
- (2) Huge disguised unemployment exists at the subsistence sector, which could be a nearly infinite resource for unskilled labor supply for the capitalist sector;
- (3) All of capital stock exists only at the capitalist sector while none is utilized at the subsistence sector; and
- (4) The capital accumulation or investment originates from benefit of capital while wages for both sectors are consumed totally.

Of course, some simplification is also assumed, including a closed economy, etc. And this Lewis model is not regarded as dynamic, but seems comparative-static. In any case, the Lewis model accepts both capital formation and labor migration as economic growth origins; Figure A1-4 depicts the relationship between labor and marginal productivity/output at subsistence sector of Lewis model as follows:

- (1) The vertical axis of the upper panel represents marginal productivity of labor, and that of the lower shows output, while the horizontal axes of both panel depict labor;
- (2) The blue curve shows the relationship between labor and marginal productivity at the upper panel while the red curve shows that between labor and output;
- (3) The area around the pink break line of the left side is correspondent to the scope of the capitalist sector while that of the right side is to the subsistence sector;
- (4) Labor migration from the subsistence sector to the capitalist sector results in output decrease but higher marginal productivity at the subsistence sector.

Figure A1-4: Relationship between Labor and Marginal Productivity/Output at Subsistence Sector of Lewis Model



Source: Authors based on Yoshioka (2003) p. 5.

Lewis (1954) assumes that a practically unlimited excess labor at the subsistence sector exists. In reality, however, when the economy completes the large-scale labor migration from the subsistence sector to the capitalist sector, the output of the subsistence sector begins to decrease while the marginal productivity turns positive even before the Lewisian turning point⁸⁴. The price of goods of the

⁸⁴ Rostow (1960), in particular, Chapter 2: “The Five Stages of Growth - A Summary” takes another concept of so-called “Take-off.” Rostow’s five stages of development/growth are (1) Traditional society; (2) Preconditions for take-off; (3) Take-off; (4) Drive to maturity; and (5) Age of High mass consumption.

subsistence sector -- food price hikes are assumed according to scarcity -- causes some extent of return of labor to the subsistence sector where the subsistence wage is guaranteed. This is not necessarily the causality of the middle income trap focused on by Gill and Kharas (2007), but requires additional elements than the capital accumulation at the capitalist sector. Among those, e.g., Asian developing countries enjoyed the outcomes of the Green Revolution that drastically improved the productivity at the subsistence sector to supply more foods. Harris and Todaro (1970) also evolve the argument on the dual economy and development and result in the importance of rural development policy.

At the end of this appendix, the middle income trap⁸⁵ is noteworthy to be focused on. This new concept in development economics first attracted the attention of Gill and Kharas (2007), and is understood in a vague sense among academic authorities of the development economics as follows:

- (1) The national economy goes stagnant after attaining the level of *per capita* income at around US\$3,000- \$10,000 level;
- (2) It takes very long to attain the higher level of *per capita* income at around US\$20,000 level or it is not achieved yet;
- (3) Some factors are considered, including wage hikes without productivity improvements, failure to introduce new and advanced technologies, distortion originated from corruption or heavy rent seeking, strong dependence on natural resources and/or primary commodities, delay of institutional modernization process of e.g., financial and judicial system, and so on.

(references)

- Acemoglu, Daron (2009) *Introduction to Modern Economic Growth*, 2009, Princeton University Press.
- Barro, Robert J. (1991) “Economic Growth in a Cross Section of Countries,” *Quarterly Journal of Economics* 106(2), May 1991, pp. 407-43.
- Barro, Robert J. and Xavier Sala-i-Martin (1991) “Convergence across States and Regions,” *Brookings Papers on Economic Activity* 1991:1, 1991, pp. 107-82.
- Barro, Robert J. and Xavier Sala-i-Martin (1992) “Convergence,” *Journal of Political Economy* 100(2), April 1992, pp. 223-51.
- Barro, Robert J. (1998) “Notes on Growth Accounting,” *Journal of Economic Growth* 4(2), June 1998, pp. 119-37.
- CAO (2013) *World Economic Trends 2013 Autumn Report*, Cabinet Office, December 2013
- Open access at <http://www5.cao.go.jp/keizai3/2013/1209world3.pdf> (accessed on June 30,

⁸⁵ CAO (2013, chapter 2) lists Argentina, Brazil, Chile, Malaysia, Mexico, and Thailand as middle income trapped countries and notes Japan, the United States, Korea, Hong Kong, and Singapore as trap breaking economies.

- 2016).
- Cette, Gilbert, Yusuf Kocoglu, and Jacques Mairesse (2009) “Productivity Growth and Levels in France, Japan, the United Kingdom and the United States in the Twentieth Century,” *NBER Working Paper No. 15577*, December 2009.
- Open access at <http://www.nber.org/papers/w15577.pdf> (accessed on June 30, 2016).
- Domar, Evsey (1946) “Capital Expansion, Rate of Growth, and Employment,” *Econometrica* 14(2), April 1946, pp. 137-47.
- Gill, Indermit and Homi Kharas (2007) *An East Asian Renaissance: Ideas for Economic Growth*, 2007, Washington, DC: World Bank.
- Open access at http://siteresources.worldbank.org/INTEASTASIAPACIFIC/Resources/226262-1158536715202/EA_Renaissance_full.pdf (accessed on June 30, 2016)
- Harris, John R. and Michael P. Todaro (1970) “Migration, Unemployment and Development: A Two-Sector Analysis,” *American Economic Review* 60(1), March 1970, pp. 126-42.
- Harrod, Roy F. (1939) “An Essay in Dynamic Theory,” *Economic Journal* 49(193), March 1939, pp.14-33
- Kosai, Yutaka and Yoshitaro Ogino (1980) *Contemporary Japanese Economy*, Nihon Hyoron Sha, June 1980 [in Japanese, 『日本経済展望』].
- Lewis, W. Arthur (1954) “Economic Development with Unlimited Supply of Labor,” *Manchester School of Economic and Social Studies* 22, May 1954, pp.139-91; reprinted in A. N. Agarwala and S. P. Singh (eds.) *The Economics of Underdevelopment*, Oxford University Press, 1963.
- Minami, Ryoshin (1979) *Tipping Point in Japanese Economy – From Excess Labor to Shortage*, Sobun Sha, 1970 [in Japanese, 『日本経済の転換点 –労働の過剰から不足へ』].
- Ohkawa, Kazushi and Henry Rosovski (1973) *Economic Growth in Japan – Trend Acceleration in the 20th Century*, Toyo Keizai, 1973 [in Japanese, 『日本の経済成長 – 20 世紀の趨勢加速』].
- Ohkita, Yoichi (2010) *Economy of Postwar Japan*, Toyo Keizai, 2010 [in Japanese, 『戦後日本経済論』].
- Patric, Hugh and Henry Rosovski eds., (1976) *Asia’s New Giant: How the Japanese Economy Works*, Brookings Institution, 1976.
- Rebelo, Sergio (1991) “Long-Run Policy Analysis and Long-Run Growth,” *Journal of Political Economy* 99(3), June 1991, pp. 500-21.
- Romer, Paul M. (1986) “Increasing Returns and Long-Run Growth,” *Journal of Political Economy* 94(5), October 1986, pp. 1002-37.
- Romer, Paul M. (1994) “The Origins of Endogenous Growth,” *Journal of Economic Perspectives* 8(1), Winter 1994, pp.3-22.
- Rostow, W. W. (1960) *The Stages of Economic Growth: A Non-Communist Manifesto*, Cambridge University Press, 1960; in particular, Chapter 2: “The Five Stages of Growth - A Summary,” pp. 4-16.

- Senhadj, Abdelhak (2000) “Sources of Economic Growth: An Extensive Growth Accounting Exercise,” *IMF Staff Papers* 47(1), 2000, pp. 129-57.
- Solow, Robert M. (1956) “A Contribution to the Theory of Economic Growth,” *Quarterly Journal of Economics* 70(1), February 1956, pp. 65-94.
- Solow, Robert M. (1957) “Technical Change and the Aggregate Production Function,” *Review of Economics and Statistics* 39(3), August 1957, pp. 312-20.
- Swan, Trevor W. (1956) “Economic Growth and Capital Accumulation,” *Economic Record* 32(2), November 1956, pp. 334-61.
- Yoshikawa, Hiroshi (1999) “Potential Growth Rate of Japanese Economy,” *Economic Review* 50(3), Hitotsubashi University, July 1999, pp. 228-37 [in Japanese, 「日本経済の潜在成長率」、『経済研究』一橋大学].
- Yoshioka, Shinji (2003) “A Note on a Theoretical Model for Economic Development: Mathematical Representation of Lewis Model,” *TSQ Discussion Paper Series 2002/2003-No.9*, March 2003.

Appendix 2: Business Cycle Dating, Composite Indicator (CI), and Stochastic Business Indicator

This appendix focuses on the business cycle and consists of three parts: the first part describes the practical process and basic methodology of the business cycle dating in Japan; the second reveals the calculation process of the composite index (CI), officially adopted as reference series for assessing business cycles; and the third addresses the estimation process of the stochastic business indicator proposed by Stock and Watson (1989, 1990), which is not estimated at the CAO.

(Business Cycle Dating)

According to CAO (2016), at present in Japan, the reference date of a business cycle is first discussed in the Investigation Committee for Business Cycle Indicators, based on historical diffusion indexes, composed of all selected series of coincident diffusion indexes. Consecutively, the President of ESRI determines the reference date. The historical diffusion indexes determine the peak and trough for each selected time series of diffusion indexes (this is referred to as the individual turning point), which are calculated by marking the period from trough to peak with a plus, and the period from peak to trough with a minus. Since the change in direction is determined by smoothing irregular month-to-month movements of individual time series, the historical diffusion index calculated from these values is relatively smooth, and reflects the basic movement of the business cycle. The last month when the historical diffusion index compiled from a selected series of coincident indexes stays below the 50-percent line corresponds to the cyclical trough; the last month when this index stays above the 50-percent line corresponds to the cyclical peak.

In addition, the peaks and troughs of each individual time series are dated by applying the Bry-Boschan method, which was developed by the U.S. National Bureau of Economic Research (NBER) and reported at Bry and Boschan (1971). In simple terms, this method determines the cyclical peak or trough by providing a series of rules. Two examples of this rule: that five months or more are required in the period between peak and trough, and that the duration of one cycle must be 15 months or more. This procedure, which also involves multiplication of the 12-month moving average, was presented along with a computer program to actually run it. CAO (2015a) reveals the reference dates of business cycle in Japan as following Table A2-1:

Table A2-1: The Reference Dates of Business Cycles in Japan

Peak (By Month)	Trough (By Month)	Peak (By Quarter)	Trough (By Quarter)
Jun. 1951	Oct. 1951	2Q 1951	4Q 1951
Jan. 1954	Nov. 1954	1Q 1954	4Q 1954
Jun. 1957	Jun. 1958	2Q 1957	2Q 1958
Dec. 1961	Oct. 1962	4Q 1961	4Q 1962

Oct. 1964	Oct. 1965	4Q 1964	4Q 1965
Jul. 1970	Dec. 1971	3Q 1970	4Q 1971
Nov. 1973	Mar. 1975	4Q 1973	1Q 1975
Jan. 1977	Oct. 1977	1Q 1977	4Q 1977
Feb. 1980	Feb. 1983	1Q 1980	1Q 1983
Jun. 1985	Nov. 1986	2Q 1985	4Q 1986
Feb. 1991	Oct. 1993	1Q 1991	4Q 1993
May. 1997	Jan. 1999	2Q 1997	1Q 1999
Nov. 2000	Jan. 2002	4Q 2000	1Q 2002
Feb. 2008	Mar. 2009	1Q 2008	1Q 2009
Mar. 2012	Nov. 2012	1Q 2012	4Q 2012

Source: CAO (2015a)

(Composite Index)

From April 2008 on, the government of Japan has officially adopted a composite index as reference series for assessing business cycles, named Indexes of Business Conditions prepared by the Cabinet Office. This Indexes of Business Conditions (hereafter, CI) consists of three indexes: leading, coincident, and lagging indexes. Each Index includes components as shown in Table A2-2:

Table A2-2: Components of Indexes of Business Conditions

Leading Index	
L1:	Index of Producer's Inventory Ratio of Finished Goods (Final Demand Goods)
L2:	Index of Producer's Inventory Ratio of Finished Goods (Producer Goods For Mining and Manufacturing)
L3:	New Job offers (Excluding New School Graduates)
L4:	Machinery Orders at Constant Prices (Manufacturing)
L5:	Total Floor Area of New Housing Construction Started
L6:	Consumer Confidence Index
L7:	Nikkei Commodity Price Index (42 items)
L8:	Money Stock (M2) (Change from Previous Year)
L9:	Stock Prices (TOPIX)
L10:	Index of Investment Climate (Manufacturing)
L11:	Sales Forecast DI of Small Business
Coincident Index	
C1:	Index of Industrial Production (Mining and Manufacturing)
C2:	Index of Producer's Shipments (Producer Goods for Mining and Manufacturing)
C3:	Index of Producer's Shipment of Durable Consumer Goods

	C4: Index of Non-Scheduled Worked Hours (Industries Covered)
	C5: Index of Producer's Shipment (Investment Goods Excluding Transport Equipments)
	C6: Retail Sales Value (Change From Previous Year)
	C7: Wholesale Sales Value (Change From Previous Year)
	C8: Operating Profits (All Industries)
	C9: Index of Shipment in Small and Medium Sized Enterprises (Manufacturing)
	C10: Effective Job Offer Rate (Excluding New School Graduates)
Lagging Index	
	Lg1: Index of Tertiary Industry Activity (Business Services)
	Lg2: Index of Regular Workers Employment (Industries Covered) (Change From Previous Year)
	Lg3: Business Expenditures for New Plant and Equipment at Constant Prices (All Industries)
	Lg4: Living Expenditure (Workers' Households) (Change From Previous Year) (Not Including Agricultural, Forestry and Fisheries)
	Lg5: Corporation Tax Revenue
	Lg6: Unemployment Rate
	Lg7: Contractual Cash Earnings (Manufacturing)
	Lg8: Consumer Price Index (All items, Less Fresh Food) (Change from Previous Year)
	Lg9: Index of Producer's Inventory (Final Demand Goods)

Source: CAO (2015b).

Summarizing CAO (2016)⁸⁶, the Indexes of Business Conditions (CI) is calculated according to following four steps:

Step 1: A formula is used for calculating the symmetric percent change of individual series as in the following:

$$r_i(t) = 200 \times \frac{y_i(t) - y_i(t-1)}{y_i(t) + y_i(t-1)}$$

where r Symmetric percent change
 y Individual series
 i Number assigned to each indicator
 t Time point

If the given time series is zero or a negative value, or is already in percentage form, simple arithmetic differences are calculated:

$$r_i(t) = y_i(t) - y_i(t-1)$$

⁸⁶ Yoshizoe et al. (2003) provide more detailed information and discussion.

Then, outliers are trimmed using the following formula:

$$\varphi_2(r_i(t)) = \begin{cases} -k \times (Q3_i - Q1_i) & \text{for } r_i(t) < -k \times (Q3_i - Q1_i) \\ r_i(t) & \text{for } -k \times (Q3_i - Q1_i) \leq r_i(t) \leq k \times (Q3_i - Q1_i) \\ k \times (Q1_i - Q3_i) & \text{for } r_i(t) > k \times (Q3_i - Q1_i) \end{cases}$$

where $Q1$ The first quartile in the interquartile range

$Q3$ The third quartile in the interquartile range

Step 2: The trend of individual series (mean percent change) is calculated by the trimmed 60-month backward moving average as follows:

$$\mu_i(t) = \frac{\sum_{\tau=t-59}^{60} \varphi(r_i(\tau))}{60}$$

where $\mu_i(t)$ Mean percent change

Next, percent change normalized by interquartile range is calculated by applying the following formula:

$$Z_i(t) = \frac{\varphi(r_i(t)) - \mu_i(t)}{Q3_i - Q1_i}$$

where $Z_i(t)$ Mean percent change

Step 3: Composite percentage change is calculated by adding up trend (composite mean percent change), and the mean of percent change normalized by interquartile range (composite percent change normalized by interquartile range). In this process, composite percent change normalized by interquartile range is multiplied by the mean of interquartile ranges (composite interquartile range) so that the levels of the trend component and the cyclical component coincide as follows:

$$\overline{\mu(t)} = \frac{\sum_i^n \mu_i(t)}{n}$$

$$\overline{Z(t)} = \frac{\sum_i^n Z_i(t)}{n}$$

$$\overline{Q3 - Q1} = \frac{\sum_i^n (Q3_i - Q1_i)}{n}$$

$$V(t) = \overline{\mu(t)} + (\overline{Q3 - Q1}) \times \overline{Z(t)}$$

where $V(t)$ Composite percent change

n Number of individual indicators (y)

Step 4: As in the previous calculation method of composite indexes, composite percent change is cumulated as follows:

$$I(t) = I(t-1) \times \frac{200 + V(t)}{200 - V(t)}$$

Finally, the index is rebased so that the value for the reference year is equal to 100. The current reference year is 2010.

(Stochastic Business Indicator)

Other than the above business cycle indicators, including CI in Japan, Stock and Watson (1989, 1990) propose another type of stochastic business indicator that assumes a unique and latent index, affecting and revealing some observable indicators, such as production, labor, income, and consumption, among others. According to Stock and Watson (1989, 1990), assuming that this unique and latent index and the error terms follow autoregressive (AR) process, the model of stochastic business indicator is mathematically represented in the following model:

$$\begin{aligned} y_i(t) &= \alpha_i + \beta_i c(t) + u_i(t) \\ c(t) &= \gamma + \tau_1 c(t-1) + \tau_2 c(t-2) + \dots + \tau_n c(t-n) + e(t) \\ u_i(t) &= \lambda_i u_i(t-1) + \lambda_i u_i(t-2) + \dots + \lambda_i u_i(t-m) + \varepsilon_i(t) \end{aligned}$$

where	y	Observable business indicators ($i=1, 2, 3, \dots$)
	c	Unique and latent business indicator
	u, e, ε	Error term ($i=1, 2, 3, \dots$)
	i	Number of observable indicators
	n	Number of lags of AR process for c
	m	Number of lags of AR process for u
	$\alpha, \beta, \gamma, \tau, \lambda$	Parameters

Using lag operator L , above model can be expressed as follows:

$$\begin{aligned} y_i(t) &= \alpha_i + \beta_i c(t) + u_i(t) \\ \phi(L)c(t) &= \omega + e(t) \\ \theta(L)u(t) &= \varepsilon(t) \end{aligned}$$

Here, ϕ represents a lag polynomial of $\phi = 1 - \phi_1 L - \phi_2 L^2 - \dots - \phi_n L^n$ and θ does that of

Of course, the state variable δ is an $n+m$ vector. According to usual definition, I_k means a unit matrix with k rows and columns, and $O_{k,l}$ represents a null matrix with k rows and l columns. And, Σ means a diagonal matrix with its elements of $\Sigma = \text{diag}(1 \ 0'_{n-1} \ h_1 \ h_2 \ \dots \ h_{n-1} \ h_n \ 0'_{(n-1)m})$, while h is a diagonal element of H . ϕ is a parameter of n -degree lag polynomial for the latent index. θ is a diagonal matrix with elements of θ , which is a parameter of m -degree lag polynomial for the error term u .

Since the above-mentioned general form of the state space model quoted from Okusa (1992) is quite complicated, this study assumes the following three points, which seem adequately plausible, to simplify the model according to existing literature, including Stock and Watson (1989, 1990) and Okusa (1992):

- 1) The observable indicators are taken from production, labor, income, and consumption, i.e., $i=4$.
- 2) The unique and latent business indicator c is subject to AR(2) process, i.e., $n=2$.
- 3) The error term u is subject to AR(1) process, i.e., $m=1$.

Above model for stochastic business indicator will be transformed into following simplified state space model system:

1) Observation Equations

$$\begin{bmatrix} y_1(t) \\ y_2(t) \\ y_3(t) \\ y_4(t) \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{bmatrix} + \begin{bmatrix} \beta_1 & 1 & 0 & 0 & 0 \\ \beta_2 & 0 & 1 & 0 & 0 \\ \beta_3 & 0 & 0 & 1 & 0 \\ \beta_4 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} c(t) \\ u_1(t) \\ u_2(t) \\ u_3(t) \\ u_4(t) \end{bmatrix}$$

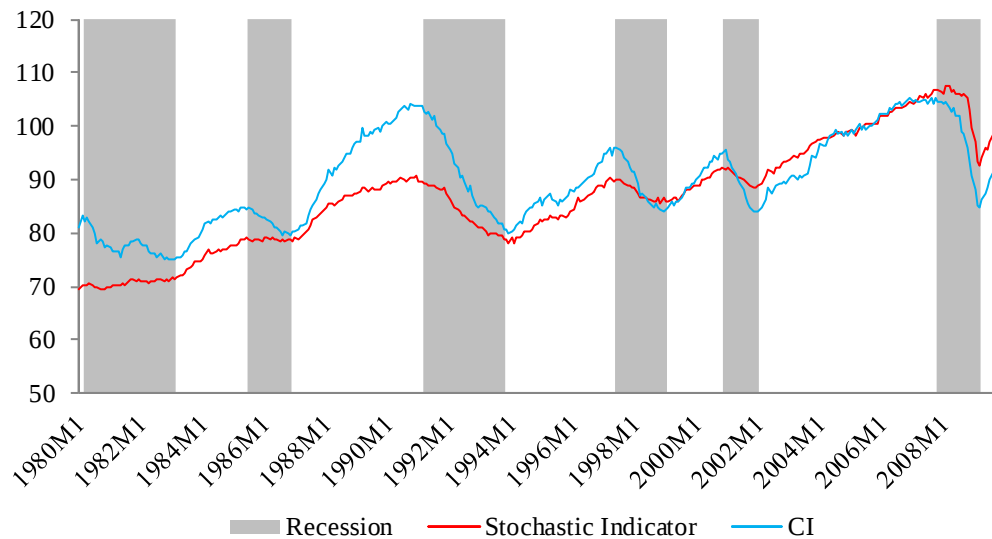
2) Transit Equations

$$\begin{bmatrix} c(t) \\ u_1(t) \\ u_2(t) \\ u_3(t) \\ u_4(t) \end{bmatrix} = \begin{bmatrix} \phi_1 & \phi_2 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \lambda_1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \lambda_2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \lambda_3 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \lambda_4 \end{bmatrix} \begin{bmatrix} c(t-1) \\ c(t-2) \\ e(t) \\ u_1(t-1) \\ u_2(t-1) \\ u_3(t-1) \\ u_4(t-1) \end{bmatrix}$$

This simplified state space model will be solved with a Kalman filter presented by Kalman (1960). In this appendix, further explanation for a state space models and Kalman filter is outside the scope of

this study. For comprehensive information on application of state space model to econometric field, Harvey (1981) is one of the most useful studies. Apart from Kalman's original paper, Meinhold and Singpurwalla (1983), Snyder and Forbes (1999), and Grewal and Andrews (2002) will provide further information on Kalman filter and its algorithm.

Figure A2-1: Stochastic Indicator and Index of Business Conditions (CI) (2005=100)



Source: Yoshioka (2010) p.18 Figure 2.

Finally, Figure A2-1 above depicts CI calculated by the government and estimation results of Yoshioka (2010), which employs stochastic business indicators.

(references)

Bry, Gerhard and Charlotte Boschan eds., (1971) *Cyclical Analysis of Time Series: Selected Procedures and Computer Programs*, National Bureau of Economic Research, 1971

Open access at http://papers.nber.org/books/bry_71-1 (accessed on July 20, 2016).

CAO (2015a) “The determination of Business-Cycle Peak and Trough,” Cabinet Office, July 24, 2015.

Open access at <http://www.esri.cao.go.jp/en/stat/di/150724rdates.html> (accessed on June 30, 2016).

CAO (2015b) “The Changed Components of the Indexes of Business Conditions,” Cabinet Office, August 6, 2015.

Open access at <http://www.esri.cao.go.jp/en/stat/di/150806components.html> (accessed on June 30, 2016).

CAO (2016) “Guide for Using Diffusion Indexes and Composite Indexes,” Cabinet Office, 2016

Open access at <http://www.esri.cao.go.jp/en/stat/di/di2e.html> (accessed on June 30, 2016).

- Grewal, Mohinder S. and Angus P. Andrews (2002) *Kalman Filtering (Second Edition)*, 2002, John Wiley & Sons.
- Harvey, Andrew C. (1981) *Time Series Models*, Philip Allen, London, 1981.
- Kalman, Richard E. (1960) “A New Approach to Linear Filtering and Prediction Problems,” *Journal of Basic Engineering* 82 (Series D), 1960, pp. 35-45.
- Meinhold, Richard J. and Nozer D. Singpurwalla (1983) “Understanding the Kalman Filter,” *American Statistician* 37(2), May 1983, pp. 123-127.
- Okusa, Yasushi (1992) “A Probability Model of the Coincident Economic Index in Japan,” *Doshisha University Economic Review* 44(1), 1992 pp.25-60 [in Japanese 大日康史「日本における確率的景気指数の開発」、『同志社大学経済学論叢』].
- Snyder, Ralph D. and Catherine S. Forbes (1999) “Understanding the Kalman Filter: An Object Oriented Programming Perspective,” *Working Paper 14/99*, Department of Econometrics and Business Statistics, Monash University, December 1999.
- Stock, James H. and Mark W. Watson (1989) “New Indexes of coincident and leading economic indicator,” *NBER Macroeconomic Annual* 4, 1989, pp. 351-409.
- Stock, James H. and Mark W. Watson (1990) “A Probability Model of the Coincident Economic Indicators,” Lahiri, Kajal and Geoffrey H. Moore eds., *Leading Economic Indicators: New Approaches and Forecasting Records*, Chapter 4, Cambridge University Press, 1990, pp. 63-89.
- Yoshioka, Shinji (2010) “Identifying Trough of Recent Recession in Japan: An Application of Stochastic Business Indicator,” *Annual Review of Economics* vol.26, Nagasaki University, June 2010, pp. 9-23.
- Open access at http://naosite.lb.nagasaki-u.ac.jp/dspace/bitstream/10069/24466/1/keinen26_9.pdf (accessed on June 30, 2016).
- Yoshizoe, Yasuto et al. (2003) “New Developments in Business Cycle Indicators,” *Economic Analysis* No.166, February 2003, Economic and Social Research Institute, Cabinet Office [in Japanese 美添泰人ほか「景気指標の新しい動向」、『経済分析』第166号]. Open access at <http://www.esri.go.jp/jp/archive/bun/bun166/bun166.html> (accessed on July 20, 2016).

戦後日本の高度成長期の研究：

経済計画の役割

2016 年 8 月

吉岡真史・川崎泰史

(要旨)

日本は 1950 年代半ばから 1970 年代初頭において高度成長期を経験した。本研究では、この時期の経済状況と経済政策調整、特に、経済計画が果たした重要な役割につき、政府部門における政策調整ならびに民間部門におけるガイドライン情報に焦点を当て、加えて、短期政策調整さらに年次経済報告や月例経済報告の役割とともに取り上げている。経済計画に関連する諸政策、財政政策、金融政策、産業政策などについても含まれているところである。加えて、本研究は日本経済の発展過程を明らかにするだけでなく、付加的に途上国の政府当局や民間企業のビジネスパーソンに対しても利益をもたらし、先進国を目指すキャッチアップに資することとなる。

キーワード: 高度成長、長期経済計画、日本経済の発展過程

JEL Classification Numbers: E20, H10, N15