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Economic Planning Techniques in Japan <sup>1/</sup>

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## I. Introduction

The role of economic planning in a industrialized mixed-economy has always been an important subject of debate among economists and policy-makers, whether they belong to Western or Eastern economic system. Some are critical about its harmful effect due to interventions to free market mechanism because of inadequacy in its forecasting capability and restraint upon dynamic competition; others are in favour of its role in sectoral as well as aggregate supply management especially in view of the need for planned efforts in building social overhead and in related basic industries. Although still being controversial, general feelings toward economic planning in industrial market economies appear to be inclined gradually to support the need for certain types of long-term planning or projection which tends, more or less, to bind short-term economic policy. Basic factors accounting for this tendency are a) a growing recognition of market failures as in environment and urban problems, b) increasing need for concerted sectoral planning in basic industries and social overhead, and c) importance of guide-line policy for sectoral prices and factor costs as well as output and employment.

The post-war Japanese economic planning has been roughly in line with the above tendency, though varying according to the different stages of its economic development. As discussed in

the next chapter, the earlier plans put more emphasis on physical aspects such as production, balance of payments and social investment, while recent plans are more concerned with non-physical or social aspects such as urban and environmental problems income redistribution, welfare indicators, international relations, etc.

As noted later, recent growing problems on a) trade-off between welfare oriented economic expansion and price-wage stability, b) investment alternatives among domestic vs. foreign sectors, c) choice between development and conservation of natural environment, etc. tend to require more integration and sophistication in planning techniques. Diversification of social preference in recent years has also made the Japanese planning more complicated and multi-purpose oriented. It also tend to make the plan somewhat flexible and adaptive to different social needs. These are to be classified in later chapters.

(For basic features of the Japanese planning, see Watanabe [14] and Bieda [1] )

## II. A Brief History of Japanese Economic Planning

Broadly speaking, the economic plans produced since the end of World War II are classified into four groups: planning for the reconstruction program (1946 - 49); planning for economic self-support (1950 - 56); planning for maximizing economic growth (1957 - 1966); planning for balanced economic growth and social development (1967 - present). (For details see [5], [14] )

### 1. Economic Rehabilitation Plan, 1949 - 1953

The "Economic Rehabilitation Plan, 1949 - 53", the most important of the various plans in the first group, was drafted in 1949 under the Socialist Cabinet of Tetsu Katayama. Although the plan was not officially adopted, it aimed to regain the 1930 - 1934 standard of living by the end of 1953 and to provide necessary policy measures. The plan laid special emphasis on the details of demand and supply of these items because of the extreme shortage of energy resources. Although a free-market mechanism was sought as an ultimate end, various direct controls on price and quantity of raw materials and foods and restrictions on private investment and imports were still regarded as effective measures for economic reconstruction. Annual planning targets were specified for national income and expenditure, production and foreign trade, balance between supply and demand for investment funds, and government revenues and expenditures. The plan also

emphasized United States aid and foreign capital inflow for reconstruction.

2. Five-Year Plan for Economic Self-Support, 1956 - 1960

"Five-Year Plan for Economic Self-Support, 1956 - 1960" was the first officially adopted and it was formulated under the Hatoyama Cabinet in 1955. The plan had two basic objectives: economic self-support and full employment. Because of the decline of procurement revenues after the Korean armistice and the rather gloomy export outlook at this time, the first objective seemed vital to gain a clear vision of Japan's economic development for the next five years. The increasing trend of underemployment, with an extremely high rate of increase expected in the working-age population, was another factor calling for strong planning of long-term economic policy. The plan assumed an average 5 percent growth rate of GNP during the planning period on the basis of the so-called "Colm Approach", in which the annual rate of increase in the labor force was assumed at approximately 2 percent (which was considered desirable from the point of view of employment policy), and the annual rate of increase in labor productivity at 3 percent. As for the international balance of payments, the plan's import requirement was first estimated by means of the ratio of imports to GNP; then the export target was derived on the basis of the world trade growth rate and the elasticity of Japanese exports to world

trade. Although detailed estimates were made on this broad assumption for major components of national accounts, for commodity production, for employment, etc., the plan underestimated the growth potential by taking labor as the most limiting factor of economic growth at that time and ignoring other more important limiting factors such as capital and foreign exchange. In regard to the private sector, the plan favored indirect controls through fiscal and monetary policy rather than the more direct controls relied on heavily by the 1949 - 53 plan.

### 3. New Long-Range Economic Plan, 1958 - 1962

Since shortly after the preparation of this plan, the growth rates of GNP and of exports became almost double the planned targets, the plan had to be replaced by more realistic one. The "New Long-Range Economic Plan", drafted in late 1958 (under the Kishi Cabinet) for the period of 1958-62, emphasized the role of the private economy as a driving force in economic growth and the importance of indirect controls through fiscal, monetary, and foreign exchange policy. It also stressed achieving a welfare state through full employment and a high standard of living. In regard to its planning technique, a method called "Alternative Growth Rates Approach" (suggested by Professor K. Okawa of Hitotsubashi University) was adopted. The method became more flexible than before, as it aims at selecting among

several alternatives an optimal rate of growth consistent with the constraints of a reasonable employment level, equilibrium in the international balance of payments, and availability of domestic saving. After experiments with several GNP growth rates, 6.5 percent was taken as the most reasonable target -- even though it was considered a little too ambitious, since at that time the economy happened to be in recession.

There were some serious underestimations, as enough consideration was not given to the strong upward trend that had been prevailing since around 1955 in production, investment, and exports. The assumed exports target of 10.5 percent growth annually was not seriously divergent from the actual performance of 12 percent, but the 4 percent assumption for the private investment target was far off from the actual 17.4 percent. And the actual growth rate of 10.5 percent of GNP in constant prices was so divergent from the assumed rate that this replacement plan was itself destined to be quickly replaced. Although very detailed commodity budgets had been built up for key products, specifying domestic output, imports, exports, and domestic consumption, the failure to take sufficient account of the basic economic growth potential in this period had made the detailed commodity analysis almost meaningless.

#### 4. Ten-Year Plan for Doubling National Income, 1960 - 1970

Furthermore, Mr. Hayato Ikeda's debut as the Prime Minister

in 1960 with his political slogan "Doubling worker's salary for coming ten years" accelerated the plan to be replaced by "Doubling National Income Plan" for the plan period of 1961 - 1970.

Under these circumstances, the formulation of the new plan began in June 1960, and after around a half year intensive study a draft prepared by the Economic Council, the advisory body attached to the Economic Planning Agency, was submitted to the Prime Minister on November 1, 1960. The draft was put to study by the new Cabinet jointly with the Policy Committee of the Liberal-Democratic Party (the ruling party) immediately after the November 20th general election, and were officially approved by the Cabinet on 27th December of the same year. It might be said that present plan preparation procedure was set up at the stage of this new plan formulation, for since then there has been no significant change in this procedure.

The new plan which aimed at doubling the national income for the course of coming ten years was motivated by the following three factors. First, catching up and enjoying the high standard of living in advanced western countries were the nation's dream. Second the peculiar future pattern of labour supply, i.e. a sharp increase in working-age population in the first half of the plan period and a drastic dwindling of increase in labour forces in the latter half of the plan period, required rapid economic growth for the creation of employment opportunity and an increase in labor productivity especially in the latter period. Third the



problem related to "differentials" in incomes among different groups of the people, in the regional income levels, in the productivity between large and small industry and in the wages, which was an old problem in Japanese economy and had caused the serious conflicts among social groups, should be resolved. Although there was much controversy on the measures of resolving the problem, the planners finally chose the way of so-called "baking large pie first" against the opponents way of "equal cutting the present pie first". The reasons for this choice were that; the faster economic growth is favourable to the promotion of labour mobility as well as the creation of employment opportunity which result in improving various differentials through the moving of labour forces from the traditional sectors to the modern industrial sector with high productivity, and in turn, such promotion of labour mobility is essential for further economic growth under the circumstances where the drastic fall in the increase rate of working-age population is expected.

To achieve this basic aim, the plan placed the emphasis on several objectives such as strengthening social overhead capital, providing inducements whereby a highly industrialized economic structure could be realized, promoting export trade and strengthening economic cooperation with developing countries and aiding the development of human abilities and the advancement of science and technology.

The feature of the plan related to plan implementation was

that the distinction between planning for the public sector and for the private sector was clearly drawn. Targets for various public sectors were clearly specified and the cumulative funds for the plan period were indicated and classified according to purpose. On the other hand, the guide post for private industry were simplified. The plan emphasized that the government's intention was not to exert control over private industries but to provide the information which would help them draw up their own long term projections in accordance with the long-term government policy. Such type of planning method that draws the distinction between planning for the public sector and for the private sector has been followed until recently with this plan as a turning point.

Unfortunately, however, such distinctive method also tended to make the plan rather unstable; the more the private sectors evaluate the plan's guide posts, the faster they expand their activities. Actually the business activities were stimulated by the announcement of rosy future prospects of the plan, and, for example, the 1970 level of private fixed capital formation in the plan was achieved in 1961, the very first year of the plan. On the contrary, the government fixed capital formation was kept in the pace of the plan's indication. As a result, one of the major objectives of the plan to strengthen the social overhead capital was met with a difficulty, for unbalance between private investment and government investment was accelerated towards more unfavourable direction.

Determination of the plan's quantitative targets began with the

adoption of an "Alternative Growth Rate Approach" as in the previous plan. After several experiments the rate of 7.2 percent was selected, on the assumption that with this rate GNP would double in ten years. Reflecting the aggressive attitude towards new investment of business circles, however, the original rate was changed to an increase of 9 percent for 1961 - 1963 and the plan stated that the doubling of national income should be attained in and around ten years. Despite of such political adjustment on possible economic growth path, the actual figure of economic growth rate in the first three years of plan periods amounted to 11 percent, thus exceeding the assumed growth rate of the plan considerably.

Another unexpected problem emerged during the period of such rapid economic growth was a sharp rise in consumer prices. In the plan, relative prices were assumed to change according to the economic development and structural changes of economy but the absolute level of their average was assumed to be stable. However, the consumer prices began to rise in 1960 and thereafter continued to rise at around 6 percent per annum, while the wholesale prices remained stable.

#### 5. Medium-Term Economic Plan, 1964 - 1968

In view of these developments, the Economic Council made extensive following-up studies of the Doubling National Income Plan in 1963, and issued a report late that year. In this report, the Council emphasized the need to formulate a new economic plan covering

a period of four or five years, not only because the projected figures in the Doubling National Income Plan had been considerably over-attained, but also because environments of the Japanese economy had changed substantially, requiring new policy measures. Outstanding among these changes were the shift to an open-door economy through the liberalization of foreign trade and the change from surplus to shortage in the labour market.

In accordance with this recommendation, the Government asked the Economic Council to prepare a new five year plan in early 1964. Accordingly, the Council worked out a draft plan covering the period from 1964 to 1968, and presented it to the Government in late 1964. Based on this, the Government officially adopted the "Medium-Term Economic Plan" on the 22nd of January, 1965.

The major aims of this plan are, first, to cope with the new situation such as labour shortage and the shift to an open-door economy; second, to remedy various imbalances that had emerged during the past period of rapid economic growth such as sharp rise in consumer prices, and third, to promote "social development" in order to recover a proper balance between economic and social progress of this country.

The most important feature of this plan was the method used in drawing up the plan. It was not until the Medium-term Economic Plan that rigorous econometric techniques were applied to the plan formulation and its implementation. The plan marked a turning point in the postwar history of quantitative economic planning, especially

in regard to consistency and operationality for planning purposes. Though this technique has been improved thereafter in the courses of followed revised plans such as the present plan "Basic Economic and Social Plan", of which technique would be explained in later chapter, the basic logics and structures have remained almost unchanged.

First the Economic Council began the plan drafting in the line of amendment of Doubling National Income Plan under the Ikeda Cabinet regime. In the midst of working out the draft, the Cabinet was replaced by the Prime Minister Sato who had the political slogan against the rapid economic growth and preferred to the stable economic growth and social development. Though, actually, the rate of economic growth under the Sato Cabinet regime was higher than that under the Ikeda Cabinet. Under this circumstance, the plan had to be replaced by the new plan "Economic and Social Development Plan" that was the very initiated plan by the Prime Minister Sato.

6. Economic and Social Development Plan, 1967 - 1971

In March 1967, "Economic and Social Development Plan" covering the period from 1967 to '71 was adopted officially by the Government.

At the time of Doubling National Income Plan there was a clear intention of taking growth policy, but in this plan the emphasis were placed on the remedy of imbalances and quality of life. The plan cleared its aim as follows "The ultimate aim of economic policy is to improve the nation's living both quantitatively and

qualitatively. In this plan, in order to pursue this aim, we selected the following items as major policy objectives, namely, (1) improving the efficiency of the economy, (2) securing price stability, and (3) promotion of social development".

The circumstances for economic development of Japan changed substantially due to a tightening of the labour market and a progress of trade liberalization. Meanwhile, adaptation of institutional set-up, customs and behavior of both the government and private firms to the changing circumstances was lagging, causing various imbalances. In order to achieve further development of economy and society in the coming decade, it was essential, first, to remedy various imbalances emerged in the course of rapid economic growth, and second, to cope with changes such as a shift towards open-door economy, intensification of the labour shortage and further progress of urbanization. Therefore, it was very important to promote modernization in various fields of the economy and the society.

The plan was especially anxious about the coming open-door economy. Particularly, the liberalization of international capital transactions was expected to pose many difficulties, because the business firms tended to invest so much aiming to raise their own market shares that business leaders themselves feared such tendency as "excessive competition", despite immediately after the deep recession in 1965, and thus the firms were obliged to depend so heavily on borrowed fund that the financial structure of business firms were deteriorated. Therefore the plan strongly requested to strengthen

industry's competitiveness in world markets through intensified effort for technical development and reorganization of domestic economic structure. In actual, the amalgamation of firms was stimulated as seen in steel industry, motor industry and banking business.

In order to secure price stability, the plan stressed that it was essential to improve the labour productivity of the economy through modernizing economic structure as well as maintaining stable economic growth. The plan aimed to slow down the increase rate of consumer prices from around 6 percent, the average annual increase rate in the past several years, to around 3 percent at the end of the plan period, compatible with the stable economic growth rate of 8.2 percent per annum.

The actual average growth rate of about 13 percent of GNP for the period of 1967 - 69 was again so divergent that the plan was obliged to be reviewed and revised. Since the rate of increase of the consumer prices during the same period was around 5 percent per annum, it might be said that the price policy intended in the plan also failed. Why was such discrepancy caused between the actual and the assumed, in spite of determining the future targets by using the rigorous econometric models? One of the reasons was that the members of the Economic Council considered very seriously on the difficulties of the coming open-door and labour shortage economy. Consequently, they underestimated such exogenous variables as world trade, Japan's competitiveness in the world market and growth

potential. Through the ex-post forecasting of the model simulation, it was verified that the largest error component was the underestimation of such exogenous variables. There were several excuses, of course; first, as the plan was formulated immediately after the deep recession of 1965, most people could not expect the sharp recovery of the economy; second, the planners were so timid on the announcement effects of the plan, considering the unfortunate experience in the Doubling National Income Plan; third, perhaps the most important, in the case of Economic and Social Development Plan it was strongly stressed that the economic plan should be policy-oriented, and not forecasting-oriented, therefore there was an increased consciousness that the planning was necessary to restrain economic growth from going too far and to correct the imbalances between economy and society, private sector and public sector and among various sectors of economy.

7. New Economic and Social Development Plan, 1970 - 1975

The New Economic and Social Development Plan (1970 - 1975), the draft of which was submitted by the Economic Council to the Prime Minister in April 1970, was formulated along the basic line of the Economic and Social Development Plan. It aimed at the realization of a balanced economic growth and a better living for the people in coping with new circumstances in the forthcoming years of the 1970s.

The most outstanding feature of the plan was to evaluate



positively the high potential growth capacity of Japanese economy and to aim at attaining simultaneously the high economic growth, price stability and social development. The plan assumed 10.6 percent average annual growth rate of GNP in the constant prices, and, compared with those of all preceding plans, the growth rate of this plan was the highest. The plan explained the reason of assuming such high growth rate as follows: "the economy has grown more than earlier expectations and the nation's external payment position has been strengthened at a quick pace." This implies that planners learned the experience in the old plan where they underestimated the growth potentials intentionally in order to suppress the economic expansion. In order to curb the strong economic growth trend, it was necessary for the government to have stronger intervention in resources allocation than before. In the old plan, however, there was no measures clearly indicated which would make this kind of change possible, and, as a result, the rapid economic growth took place along the growth pattern hitherto followed.

In the new plan, the strong growth trend in actual economy and the conspicuous improvement in the balance of payment positions were decisive for the planners to assume the high economic growth rate. Planners made conversations frankly with the model this time.

The plan advocated that the rate of increase of consumer prices fall gradually, from around 5 percent rise in the past several years to a level below 4 percent in the final year of the plan period. In the process of the high rate of economic growth in Japan, the

labour shortage caused the rise in wages and incomes. Due to the differences of the rises in productivity, the upward movements of prices were not uniform. The rise in wages and incomes had intensified the upward pressures on consumer prices. It was highly probable that such rising trend of prices would continue in the process of a high economic growth during the plan period. The plan did not choose the drastic measures to hold down the rise in prices by sharply lowering economic growth, because such measures would give some serious trade-off problems such as the excess capacity, unemployment and over surplus in balance of payment. These trade-off problems were checked by the model simulations and the balanced economic growth rate was selected under the boundary of tolerable rate of increase of consumer prices and excess capacity etc. In other word, in the new plan it might be said that the planning function as a generalized market research was emphasized in sharp contrast with the emphasis on the policy oriented function in the old plan.

The actual average annual growth rate of 8.9 percent for 1970 - 1972, however, is quite suggestive, as this implies, for the first time, the overestimation of the planned figures, which had never been seen in all preceding plans.

The above discussions on historical aspects of Japan's economic planning can be summarized in Table 1 which also includes the present official plan to be discussed in the next section.

Table 1. Selected features of economic plans in Japan

Name of Plan	Five-year Plan for Economic Self-Support	New Long-Range Economic Plan	Doubling National Income Plan	Medium-Term Economic Plan	Economic and Social Development Plan	New Economic and Social Development Plan	Basic Economic and Social Plan
Date published	December, 1955	December, 1957	December, 1960	January, 1965	March, 1967	April, 1970	February, 1973
Cabinet at the time of plan approved	Hatoyama	Kishi	Ikeda	Sato	Sato	Sato	Tanaka
Plan period (fiscal years)	1956-60	1958-62	1961-70	1964-68	1967-71	1970-75	1973-77
Performance prior to the plan	F.1952-55 8.6%	F.1953-57 7.3%	F.1956-60 9.1%	F.1960-64 11.3%	F.1962-66 10.0%	F.1965-69 12.7%	
Projection in the plan	F.1956-60 5.0%	F.1958-62 6.5%	F.1961-70 7.6%	F.1964-68 8.1%	F.1967-71 8.2%	F.1970-75 10.6%	F.1973-77 9.4%
Economic growth rate during the plan period	" 9.1%	" 10.1%	" 11.2%	" 11.4%	F.1967-71 11.2%	do.	do.
Method for projection	Colm method (labour x productivity)	Desirable balance chosen from 3 cases with different growth rates	Growth rate previously decided	Econometric model	do.	do.	do.
Aims	Self-support of the economy, Full employment	Maximization of growth, Improvement of national living, Full employment	do.	Rectifying imbalance	Balanced and steady economic development	Construction of admirable society through balanced economic growth	Promotion of national welfare and international collaboration
Major policy objectives	Modernization of production facilities, Promotion of international trade, Reduction of dependence on import, Discouraging consumption	Improvement of infrastructure, Heavy-industrialization, Promotion of exports, Encouraging savings	Improvement of social overhead capital, Improvement of industrial structure, Rectifying the dual structure of the economy and improvement of social stability	Modernization of low productivity sectors, Efficient use of labour force, Qualitative improvement of national living	Stabilization of prices, Improvement of economic efficiency, Promotion of social development	Improving economic efficiency from an international viewpoint, Securing price stability, Promotion of social development, Maintaining adequate economic growth and cultivating development foundations	Creating a comfortable environment, Ensuring a stable and comfortable life, Stabilization of prices, Promotion of international collaboration

III. Formulation of Objectives and Development Strategy -- The Case of the Present Plan (Basic Economic and Social Plan)

In New Economic and Social Development Plan, it was provided that the plan should be revised, if necessary, in its third year. However, the rapid change in domestic and international situation after the plan was made, requested fundamental policy shift, and has made it necessary not merely for revision but for an entirely new plan. (4)

The basic background, which requires a policy shift and therefore a new plan, consists of the following three major fields. The first is a change in the international and socioeconomic background. Especially, a change in the international economic balance resulted from rapid expanding economic strength of the EEC and Japan on the one hand, and growing shakiness of the U.S. position on the other, is accompanied with an incipient instability in the postwar world economic order, which has primarily been based on the IMF-GATT system, and consequent movement toward formation of a new world economic order. What can not also be overlooked are relaxation of East-West tensions -- as witnessed by China's admission to the United Nations, reestablishment of Sino-Japanese diplomatic relations, realization of a Viet Nam peace agreement, progress in peace diplomacy in Europe, and other developments -- and continuing failure to reduce the gap between so called countries of the north and countries of the south.

The second is the domestic socioeconomic structural change, and

is classified into the following three elements.

(1) Maldistribution of wealth

Expanding inequality in income distribution in spite of outstanding increase in average income level. And an inadequate stock of social overhead capital, as attested by a lagging behind of improvement of the living environment, including housing, in comparison to an abundance of productive capital accumulation.

(2) Expansion of external diseconomy

Accompanied with an increase in interaction among socioeconomic activities, various kind of external diseconomy, as observed by problem of environmental disruption and that of overcrowding and underpopulation, have been expanding.

(3) Emergence of limitedness

As the scale of production and consumption has increased, the problem of limiteness of natural resources, energy, environment capacity, etc., has arisen.

The third major change is observed in national consciousness.

One change in national consciousness has been its diversification and sophistication as the level of income has risen.

Another change has been the emergence of the desire for greater social justice and a rise in the desire for safety.

(Overall survey of national consciousness was undertaken as "National Preference Study" in conjunction with the drafting of this plan.)

It was required for the overall policy shift which could response

to the above mentioned structural change in both domestic and international situation. Prime Minister Kakuei Tanaka officially requested the Economic Council to draft a new plan in August 1972, and the Council worked out the draft and presented it to the government in early 1973. Based on this draft the government officially adopted the new plan called "Basic Economic and Social Plan" on 13th of February in 1973.

The Basic Economic and Social Plan aims at shifting policy from the past direction which was oriented toward high economic growth to the new direction which is oriented toward national welfare. For this purpose, it is necessary to remodel the Japanese socio-economic structure into one more compatible with new era at hand after reconsidering the whole range of systems and rules presently embodied therein. And the plan shows the following four principles on the basis of which the policy shift should be carried out.

(1) Respect for socioeconomic efficiency

To change the nature of economic activity from the pursuit of economic efficiency in the narrow sense of the term to a compatibility with pollution control, preservation of the natural environment, prevention of disorderly urban concentration.

(2) Securing social justice

To secure social justice through making income distribution more equitable and proceeding with equalization of educational, employment and other opportunities.

(3) Promotion of decentralization

To promote decentralization of decision making in order that the welfare policy will be implemented on the basis of selection by the regional or community residents.

(4) Promotion of international collaboration

To take the road of international collaboration for the purpose of contributing to the harmony and progress of mankind, as is fitting in view of international standing of Japan as the second ranking economic power in the Free World.

This plan, aiming at the simultaneous promotion of national welfare and international collaboration, indicates the basic guidelines for policy implementation in the first five years (F Y 1973 - 1977) of the long-term process of realization of a vigorous welfare society.

This plan has several features which are not found in the earlier plans. The first feature is that the plan gives targets to be attained within the period of the plan in detail and in quantitative term as much as possible (see Table 2). Since the government's role will become much more important and cover much wider fields for realization of welfare society, the targets are given as a detailed commitment to the people by the government's activity.

The second feature is that the plan indicates policy measures to be given particular emphasis in the first half of the planning period. Those are as follows.

Table 2 Targets to be Reached During the Period of the Plan

Area	Item	Standard
Creation of a rich environment Preservation of the environment	Air pollution due to sulfur oxides	Environmental Quality Standards, more stringent than those presently in force shall be established to avoid adverse effects on human health. (2) In the Big Three Bay Areas, the amount of discharge shall be reduced to about half of the FY 1970 level.
	Water pollution	(1) At least the present water quality standards or the provisional targets shall be met during the period of the Plan, with a view to restoration of a situation of no adverse effects on the health or living environments by 1985. (2) In the Big Three City Areas, the BOD discharge load will be reduced to about one-half of the 1970 level.
Living environment facilities	City parks	4.7 sq. m per capita (estimated figure for FY 1972, 3 sq. m; goal for FY 1985, 9 sq. m)
	Sewerage systems	Service to 42% of the population (estimated figure for FY 1972, 19%)
Nationwide transportation and communications network	Disposal of refuse	Within areas covered by plans: 100% sanitary disposal (FY 1975; estimated figure for FY 1972, 87%)
	Combustible refuse	100% disposal (FY 1980; estimated figure for FY 1972, 81%)
Improvement of the agricultural and forestal environments	Super Express (Shinkansen)	Extension to attain the total length of approx. 1,900 km in operation (construction target by FY 1985, about 7,000 km)
	National Expressways	Extension to attain the total length of approx. 3,100 km in operation (construction target by FY 1985, about 10,000 km)
Ensuring a comfortable, stable life Social security	Telephone subscription	Catching up with backlog demand on a nationwide scale
	Agricultural land	Doubling of hectareage which supports highly efficient farming (approx. 1.2 million ha. in FY 1972)
Ensuring a comfortable, stable life Social security	Reserve forests	Designation of 10% more reserve forest area (6.9 million ha. in FY 1972)
	Ratio of transfer income to national income	8.8% (estimated figure for FY 1972, 6.0%)
Ensuring a comfortable, stable life Social security	Pensions	From FY 1973, a standard monthly pension of ¥50,000, with further improvements thereafter
	National pension insurance	Setting of a level commensurate with that of the Employee's Pension Insurance

Area	Item	Standard
Housing	Non-contributory Old Age pension	¥5,000 a month in FY 1973, ¥10,000 a month in FY 1975, and further generous improvements thereafter
	Social welfare facilities	Setting such facilities on a footing that will make it possible to accommodate elderly bed-ridden people, the seriously mentally or physically handicapped, and others who need care in them
Employment environment	Publicly funded housing	Construction of 4 million new units
	Housing developments	Early completion of large-scale "new town" housing developments and other smaller projects already underway in the Tokyo and Osaka metropolitan areas covering approx. 30,000 ha. (to accommodate a total population of about 4 million) and commencement of new projects
Education, sports	5-day workweek	General adoption
	Raising of compulsory retirement age	General adoption of compulsory retirement at age 60 (presently 55)
Price stability	Educational facilities	Improvement of facilities for kindergarten, primary and secondary compulsory education, and higher education, as well as extension of medical colleges and university departments of medicine to cover all prefectures
	Community sports	Provision over a period of about 10 years of readily accessible sports facilities such as athletic grounds, gymnasiums, swimming pools, playgrounds, etc.
Promotion of international collaboration	Consumer prices	An average annual rise of not more than 5%
	Wholesale prices	Stable, unaccelerated rise
Promotion of international collaboration	Balance of international payments	A balanced basic account within 2-3 years
	Economic aid (Flow of financial resources)	Early realization within the period of the Plan of a level of the flow corresponding to 1% of gross national product
Promotion of international collaboration	Official development assistance	Raising of its ratio to GNP to the international level by an early date, attainment of the international goal of 0.7% over a longer period, and improvement of the terms and conditions of assistance

- Notes:
1. The Big Three Bay Areas—areas along Tokyo Bay, Osaka Bay, and northern part of Ise Bay
  2. The Big Three City Areas—the part of the Kanto Area along the coast, the Tokai coastline, and the Osaka-Kobe area
  3. BOD—biochemical oxygen demand, widely used as an index of water pollution



- (a) Pollution Control
- (b) Prevention of soaring of land prices
- (c) Improvement of social security
- (d) Achievement of external equilibrium

This is an attempt to put a priority among various targets with time schedule.

The third feature of this plan is to make explicit the desirable direction of long-term development of Japan's economic and social structure toward realization of vigorous welfare society up till 1990. The plan which covers the next five years (up till 1977) holds very important position to mark setting in motion of this long-term process. It was a fruitful results that Economic Planning Agency had newly developed a long-term planning model named COSMO (Comprehensive System Model) in order to foresee the direction of long-term development.

The fourth feature of the plan is to indicate various constraints which face on the desirable development of Japan's economy and society. Difficulties in desirable shift of Japanese industrial structure, trade-off relationship between expansion of production capacity and preservation of environment, constraints of supply of natural resources, especially energy and water, against economic development and some other items are shown explicitly in relation with the study to forecast long-term development.

The fifth feature is that the plan declared that it should be followed up by a system for steady implementation of policy ensemble

outlined in it. For this purpose, the plan provided that the Economic Council should conduct each year a follow-up study of progress being made and publish its findings in the form of an annual report. Arrangements will also be made to enable reflection of the findings of these reports in the actual management of the economy.

The following Table 3 shows the major indicators assumed in this plan.

Table 3. Medium-term Plan (Basic Economic and Social Plan)

	(% , thousand billion yen)						
	1960 F.Y.		1970 F.Y.		1960-70		1972-77
	Actual	Compo- sition	Actual	Compo- sition	annual growth rate	Estimate	annual growth rate
Tr	0.6		3.2		18.3	12.3	22.0
Si	0.4		2.7		20.9	10.2	-
(Tr/y)	4.5		5.3		-	8.8	0.8
N <sub>L</sub>	45332.5		51695.0		1.3	54120.0	8.04
T <sub>wm</sub>	1,184		2,565		8.04	4,309	14.3
pV	16.2	100.0	73.2	100.0	16.3	182.9	100.0
pcC	9.1	55.9	37.6	51.3	15.3	95.2	52.1
piGE	1.2	7.5	6.2	8.5	17.6	23.1	12.6
PiP	3.2	19.6	14.6	19.9	16.6	27.7	15.2
PeE	1.8	11.1	8.7	11.8	17.0	20.8	11.4
PmM	1.8	11.0	7.7	10.6	15.8	18.6	16.7
V	20.3	100.0	57.4	100.0	11.0	105.3	100.0
C	12.0	58.7	28.5	49.6	9.1	51.1	48.5
Ip	3.3	16.2	13.3	22.6	14.8	22.8	21.6
Ih	0.8	4.1	3.4	5.9	15.1	8.0	7.6
Pc	75.8		131.9		5.7	186.7	4.9
Pjp	95.5		109.2		1.4	124.5	2.3
w	138		968		13.4	2217	12.3
u	1.5		1.2			(0.8)	
Bf	△0.1		23.7			61(59)	

#### IV. Process of Planning and Planning Machinery

The feature of planning process in Japan is that the Economic Council, comprizing the learned and experienced in university, business circles, trade union, etc., formulates the draft plan with the collaboration of the government bodies such as Economic Planning Agency, and the draft plan is approved in its almost original version by the Cabinet after consultations with Economic Policy Committee of Liberal-Democratic Party (the present ruling party).

It means that the Economic Council, though the advisory body attached to the Economic Planning Agency, has broad responsibility for the plan preparation. It is responsible for selecting plan objectives and measures, which requires highly political judgement, conciliating the conflicts among different interest groups, and all of the technical problems such as exploring growth possibilities and presenting alternative drafts. Recently, moreover, it has expanded its role into the field of reviewing the plan implementation.

In actual planning process, the Planning Bureau of the Economic Planning Agency organizes all planning process. (See the organization chart of Table 4) All the central government bodies participate in plan preparation and all of them are Cabinet members (See Table 5). Therefore the collaboration in the first stage of plan formulation is very closely made between the Planning Bureau and other government bodies, and in the second stage the collaboration is made between government bodies and different social groups such as business,

famer's circles, etc. Here it might be necessary to explain why such collaboration procedure is taken.

First, economic ministries and agencies in Japan will be roughly classified into the following three categories; (a) bodies which will make budget. (Ministry of Finance) (b) bodies which will put into practice individual economic policies and plans (Ministry of International Trade and Industry, Ministry of Agriculture, Ministry of Construction, etc.) (c) bodies which will plan, promote and coordinate the economic policies and plannings which will form the basis for carrying above (a) and (b) into effect. Economic Planning Agency falls under (c). Therefore, from the viewpoint of both smooth plan preparation and effective plan implementation, it is essential for the Planning Bureau of the Economic Planning Agency to collaborate with other government bodies. In other words, as in the final stage of plan preparation other government bodies have the veto against the draft at the Cabinet meeting, at least the advanced coordination on the contents of the draft is necessary.

Second, the members of the Economic Council comprises learned and experienced experts from university, business circles, trade union etc. (See Table 6) They are not qualified as the representatives of their circles, but experts on the planning. Therefore the Economic Council is not the very place for the negotiation of their interests. Then the collaboration between various social groups and corresponding "vertical" government bodies, which falls in (b) of above categories and through which interest groups participate in plan preparation

implicitly, is necessary, and this type of consultation with the private sector should be pointed out as one of the features of planning process in Japan.

The Planning Bureau makes the initial explorations of growth possibilities due to the various kinds of simulations using Medium-Term Econometric Model. The consequences of several alternative development paths are examined by means of detailed calculations, involving the use of conventional methods and Input-Output Model, to estimate the output of the various sectors of the economy and to check main balances such as international balance of payments so that the Government can choose the best alternative most in accord with the policy objectives. All these materials are presented to the Economic Council. In the case of the Basic Economic and Social Plan, the present plan, the Economic Council has major two subcommittees, the General Committee and the Research Committee. (See Table 6)

In the General Committee, the basic problems such as the policy objectives are discussed on the basis of these materials and finally the choice is made on policy objectives and development path of the economy. In the Research Committee, the technical aspects of planning instruments are discussed. For example, the Econometric Methods Committee, a subcommittee of the Research Committee, develops the new econometric techniques and evaluates the results of model simulations from the aspects of econometric method. After the discussion and study, these sub-committees feedback their comments and advise to the Planning Bureau. In the process of such interdependent feedback, the Planning

Bureau and the Economic Council refine their draft plan. In the course of the feedback process, the consultation is also made with other government bodies and private sectors. An early draft of the plan is sent for comment to all the central government bodies. A new draft is then made and submitted to the Economic Council. After the final discussion by the Economic Council, the final draft is sent for approval to the Cabinet. Meanwhile the EPA makes consultation with the Economic Policy Committee of the Liberal-Democratic Party on the final draft. Although the EPA is not obliged to accept the advice of the Economic Policy Committee, it generally does so. Because the Liberal-Democratic Party is the present ruling party. In Japan the draft of the plan has never been sent for approval to Parliament. In other words, the medium-term economic plan in Japan is a sort of management directive in the Government level, and not the one of legislative level in Parliament, although after published the plan is sent to Parliament as background information of comprehensive economic and social development policy.

Table 4 ORGANIZATION CHART OF ECONOMIC PLANNING AGENCY

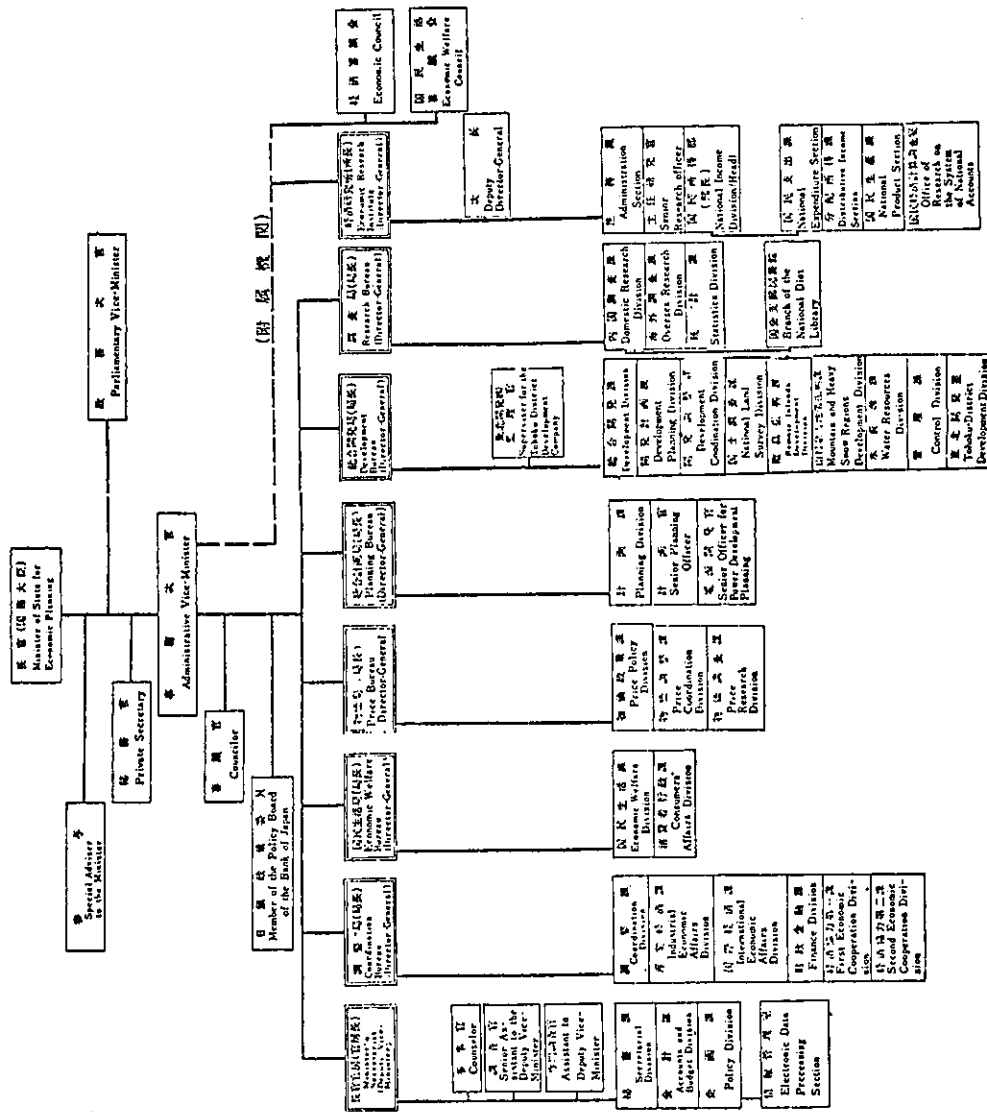




Table 5: ORGANIZATIONAL CHARTS OF JAPANESE GOVERNMENT

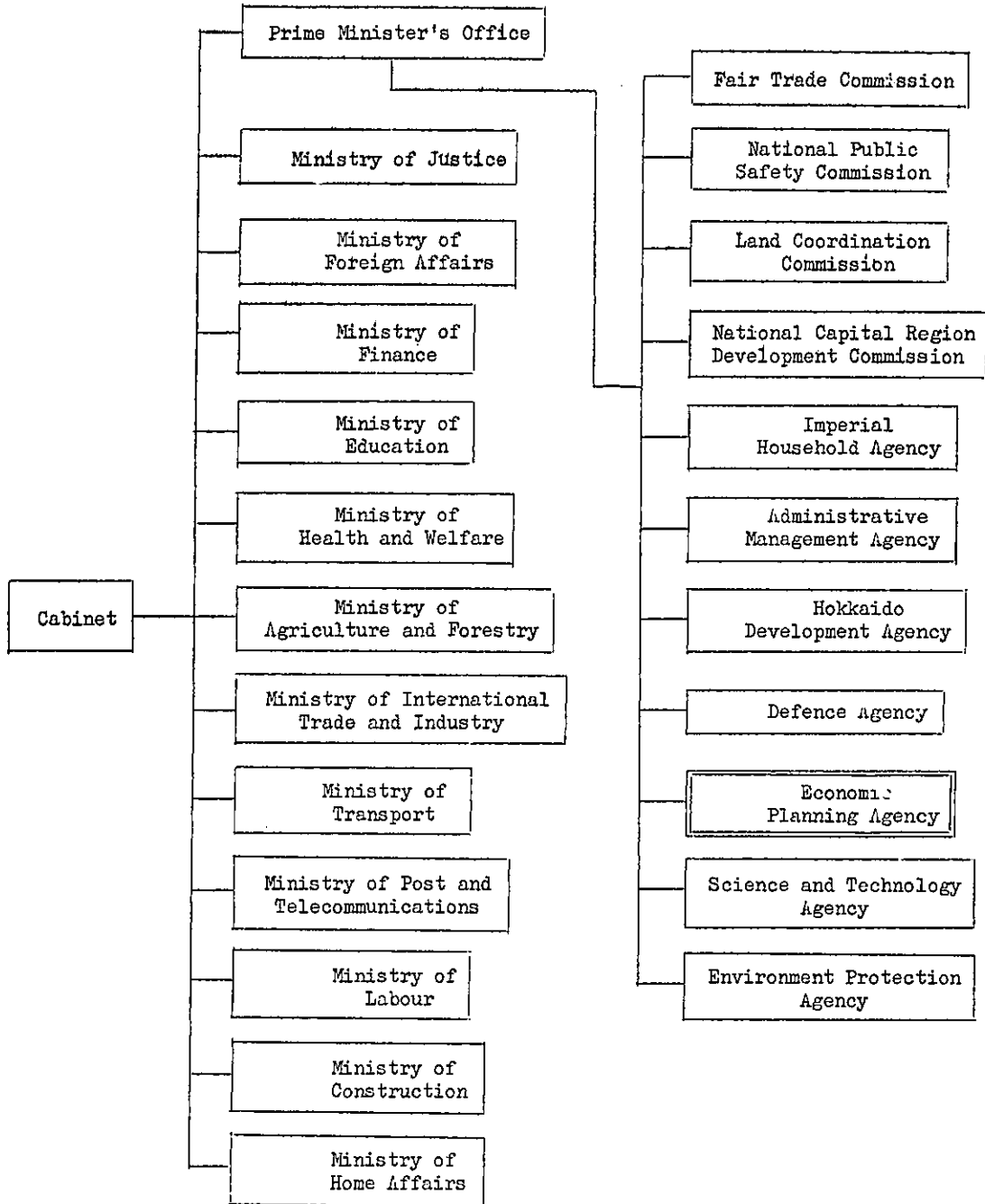
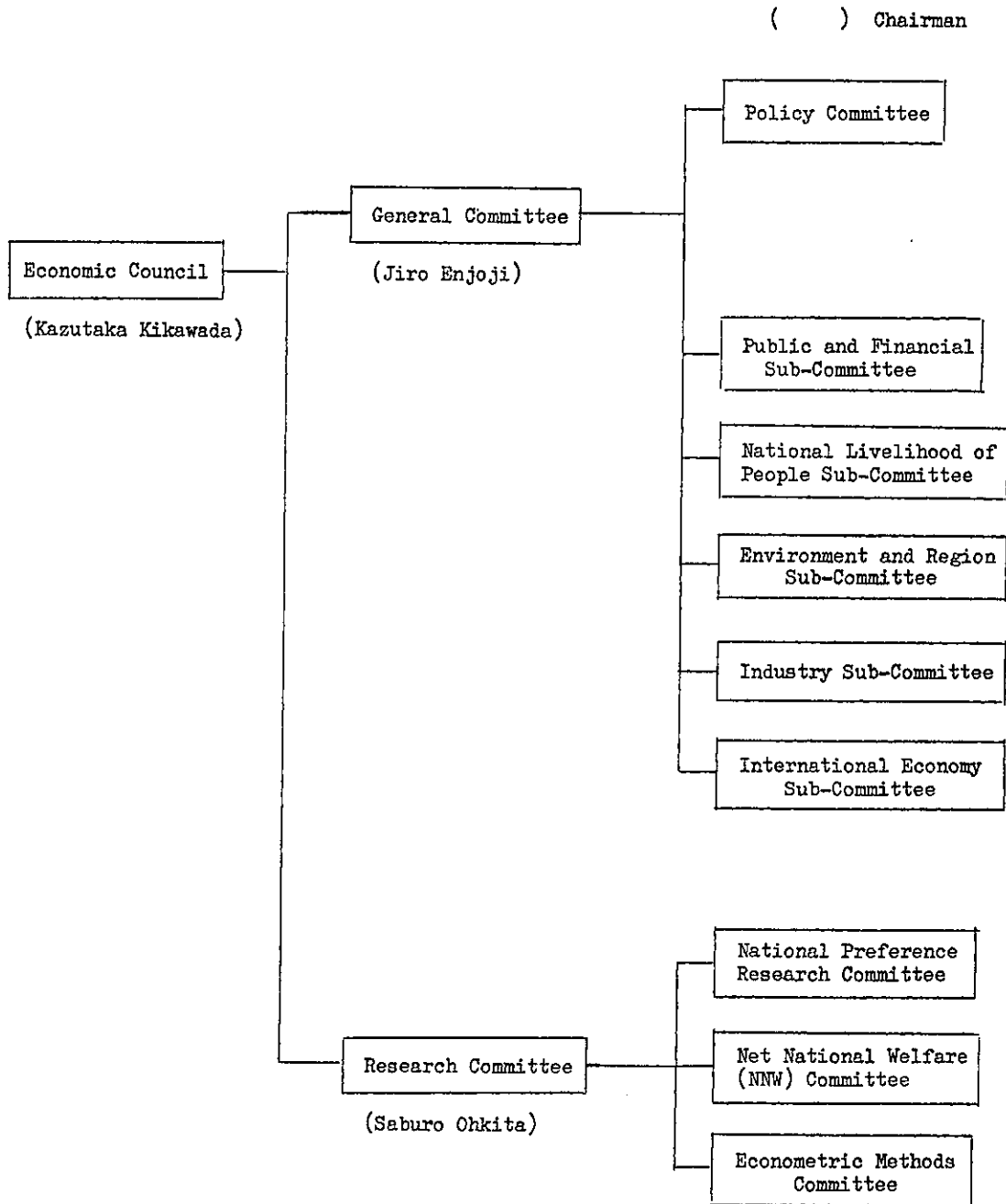


Table 6. Organization Chart of Economic Council



### List of Members of Economic Council

Hideo Aoyama	Professor, Kyoto University
Koichiro Asakai	Adviser, Ministry of Foreign Affairs
Seizi Amai	Chairman, All Japan Labor Union Conference
Makoto Ichikawa	President, General Council of Trade Unions of Japan
Syuzo Inaba	Chairman, Economic Research Association
Hiroki Imazato	President, Nippon Seiko Co., Ltd.
Yoshizane Iwasa	President, The Fuji Bank Ltd.
Koshichi Ueno	Vice President, Kansai Electric Power Co., Ltd.
Hideo Edo	President, Mitsui Real Estate Development Co., Ltd.
Jiro Enjoji	President, The Nihon Keizai Shimbun (Japan Economic Press)
Hideko Ohama	President, Better Living Information Center
Takekazu Ogura	Chairman, Institute of Developing Economies
Kunio Odaka	Emeritus Professor, Tokyo University
Kazutaka Kikawada	President, Tokyo Electric Power Co., Ltd.
Kazuyuki Kono	President, The Taiyo Bank Ltd.
Michikazu Kono	Vice President, Bank of Japan
Minoru Segawa	Chairman, The Nomura Securities Co., Ltd.
Eika Takayama	Emeritus Professor, Tokyo University
Jime Takagi	President, The Shoko Chukin Bank
Motoo Tsuchikawa	Chairman, Nagoya Rail Road Co., Ltd.
Seiichi Tohata	Emeritus Professor, Tokyo University
Toshio Doko	President, Tokyo Shibaura Electric Co., Ltd.

Shigeo Nagano	Chairman, Nippon Steel Corporation
Sohei Nakayama	Counselor, The Industrial Bank of Japan Ltd.
Ichiro Nakayama	Emeritus Professor, Hitotsubashi University
Norishige Hasegawa	President, Sumitomo Chemical Co., Ltd.
Kiichiro Hirata	Governor, The Corporation for the Reallocation of Industry and the Development of Coal Mining Areas
Shigeo Horie	President, Institute for International Studies and Training
Teizo Horikoshi	Vice President, Federation of Economic Organization
Tatsuzo Mizukami	Senior Adviser to Board, Mitsui Bussan Co., Ltd.

## V. Instruments for Plan Implementation

In a free market economy where the decision-making is decentralized, well designed planning procedure itself is an instrument for the implementation of economic policies as well as for its formulation. Individual decision makers are able to take more rational decisions compatible with the desired pattern of future economic and social development of the nation as a whole, if they are better informed the interdependences of the domestic economy and of the government's general intentions in the course of planning process. One may say that the implementation of the plan is ready to be ensured if the planners succeed in organizing well designed planning procedure and in presenting the consistent framework of policy objectives and instruments. In other words, this is the educational role of the plan. For instance in public sector in the traditional economic policy making system the piecemeal approach to economic policy was pursued by the individual decision makers. Without the comprehensive planning of total transportation system the budget for the road construction was increased by the pressure of one social group, and the budget for the railroad construction was also increased by the pressure of the other social group. In planning, however, all objectives are translated into quantitative targets and, because of the interdependence of economic variables, all targets have to be taken into account simultaneously in the formulation of policy measures. In this process, the use of rigorous econometric models are quite effective for the purpose.

Then it becomes possible to replace the traditional piecemeal approach by the systematic government action to economic policy. This approach adds the new dimension to the economic policy in general acknowledging that consistent policies can be designed only if the targets of government's wish to pursue are taken into account simultaneously and the consequences of the policy measures to be taken are known with sufficient accuracy. Therefore, nowadays, individual government bodies can not achieve their own tasks without knowing the interactions to other policy objectives of their actions. It is also the case with the private sector. The private firms have recognized the importance of long-term business planning under the circumstances of the sustained economic growth and rapid structural change. The government plan is an important basis for such business planning.

Arrangement regarding the relationship between the public and private sectors was first made explicitly in Doubling National Income Plan. Thereafter planners have avoided to introduce strong elements into the private sector and stated explicitly in the plans that the figures for the private sector are only estimates and that the direct responsibility of making plans and implementing them rest with the private firms themselves. Government plans also provide guideposts for the decisions to be made by the private firms and the broad lines of policy which influence industries in indirect ways. Therefore the main instrument to control the business activity is the aggregate demand control policy, although for the promotion of the industrial

structural change the selective financial and tax methods are employed partly to a limited extent. This, in turn, makes private firms sensitive on the figure of planned economic growth rate which they take as a signal of the government intention for economic policy.

Regarding the plan of public sector, each central government body has the obligation to gear its long-term policy to the plan, because the plan is officially approved by the Cabinet. Therefore the plan has the fairly strong planning elements for the public sector, although the intermediate targets are not indicated. In Basic Economic and Social Plan the government investment and social security programs are most strategic factors for the attainment of the desired welfare society. The total cumulative amounts of government investment for the plan periods is assumed 90,000 billion yen, and the cumulative amounts to be invested to individual items such as roads, ports and harbors, housing, land conservation, etc. are also shown in the plan. In the strict sense of planning, the amounts of individual items to be invested for five years are determined by corresponding laws along the line of the plan, but the intermediate amounts are neither indicated at this stage. Annual amounts to be invested remain to be determined in the annual budgeting stage of each year. As for the social security programs, the target to be reached in the final year of the plan period is shown 8.8 percent in terms of the ratio of current transfers from general government to households to national income. The concrete long term plan of social security program remains to be set up as soon as possible in line with the objectives

drawn in the Basic Economic and Social Plan.

Here again, the existence of a plan should, in itself, help to eliminate inconsistencies within the public sector since the various public organs can then take their economic decisions with full knowledge of the objectives and targets of central policy. At least, consequently, the plan targets on public sector will be considered as normative by the officials concerned with budget formulation and execution. In Japan the government budget is ruled by the single year budgeting principle by Budget Act. Then there is no long-term government budget. The targets drawn in the plan, however, is considered as the guide post for the formulation of annual budget, especially in determination of the government investment budget. The determination of total size of the annual government expenditure are related with the medium economic plan through another channel. This channel is worked out by the Coordination Bureau of the EPA in the form of annual economic plan.

The Coordination Bureau submits to the Cabinet at the end of year the annual plan for the coming year, which is called the economic outlook and basic policy. The economic outlook and basic policy are closely related with annual budget. The government revenues expected from taxes and other resources are estimated from the economic outlook, which includes the GNP growth rate, major components of national expenditures and of national income distribution. The policy priorities of government expenditures are also suggested by the economic outlook and basic policy. The economic outlook is not a



pure economic forecast of the coming year, but includes the government policy efforts to keep the economy towards desired direction in the projection. The targets in a medium economic plan are made use of as the guide post for such government policy efforts. The relationship between the medium term plans and the annual outlook is a specific part of the problem of how the annual outlook will be made, in quantitative sense. Some ones assert that the annual outlook should be a pure forecast, but others support the current method for the reason that the government outlook should include the government intentions. After the approval by the Cabinet, the annual budget and annual plan are submitted to the Parliament; the former for the approval and the latter as a background material of annual budget for discussion.

On the general relationships between medium-term plans and annual plans, there are two different views. One is the warning index formula and the other is the revolving method of the medium term plan. The former has the strong direction of carrying on the execution of economic policy along the line of the medium term plan, and the latter keeps the position that the objectives of the plan should be changed according to the changes in the economic situation. From the former point of view, it would be desirable to estimate the medium term economic growth potential and, based upon such potential growth path, effective demands should be controlled. Although unduly and not systematic, in Japan medium term plans and annual plans are related nearly along this line.

The Basic Economic and Social Plan clearly stated that "The drafting of this plan represents the point of departure for a policy shift the aim of which is attainment of a vigorous welfare society, and it is of utmost importance that the public understand the aim of this plan and that its goals be fully achieved. --- It will also be necessary, in the event that there is substantial divergence between real developments in the Japanese economy and society and the course envisioned in the plan, to ascertain whether such divergence is due to change in external factors, to mistaken projections, or to tardiness in implementing the policies outlined in the plan. This will be done by the Economic Council, which will conduct each year a follow-up study of progress being made and publish its findings in the form of an annual report". Due to this declaration, the Economic Council set up the sub-committee named "Follow Up Committee" and last autumn it published the first annual report. This means The Economic Council extended its role into the field of the plan implementation.

## VI. Methods for Formulation of Consistent Development Targets [8], [3]

Although a number of official economic plans were formulated after the war in Japan as mentioned in the brief history of planning, it was not until the Medium-Term Economic Plan (1964 - 1968) that rigorous econometric techniques were applied to the plan formulation and its implementation. [2], [13] Though this technique has improved thereafter in the course of the following revised plans, the basic logics and structures have remained almost unchanged. The most important features of the econometric planning model system as compared with the traditional approach are; a) the adoption of a Tinbergen-type policy model, with policy instruments and objective variables explicitly formulated; b) a more rigorous econometric approach in estimating structural parameters; c) a check-up mechanism on the relationship between (i) long-term and medium-term models and (ii) macro-and sectoral models; d) flexibility in deriving various alternative plans through computerized policy simulations, and e) operability in following-up and revising the plan in rolling-plan system.

### a. Policy Model

Now we shall briefly examine these features. As widely known, it is a distinctive feature of econometric model to specify explicitly (i) data or uncontrolled variables, (ii) policy instruments, (iii) endogenous objective and (iv) irrelevant

variables. Prior to the Medium-Term Plan, there had been no such explicit distinctions and their mutual interdependence had almost been ignored. Thus it had been quite difficult for the planners to evaluate the quantitative effects of individual policy instruments.

b. Econometric Method

As for the second feature, it is quite obvious that the econometric method has a definite advantage over the traditional method because of its neutrality in estimating structural relationships. In other words, the latter approach usually relying on so called expert guesses and judgements which are not necessarily independent from interest groups, is very likely to be biased particularly in the case of the official planning involving various conflicting political preferences.

c. Check-up Mechanism

The third feature on check-up mechanism is important as the planning objectives need be examined from various aspects, such as long-term and mid-term, macro-and sectoral view points for maintaining overall consistency. As described later, a medium-term macro-model, dealing mostly with aggregative demand, and an inter-industry model for sectoral output and factor input projection occupies a central position in our system, and these two models are linked together. For estimating longer-perspective on growth potential a two-sector growth model has been developed which is

mostly concerned with the supply side of the economy, consisting of primary and non-primary sectors. A more disaggregated long-term growth model is also now being developed, aiming at multi-sectoral optimal growth with turnpike property. 11 Another type of disaggregated long-term model has been developed which is discussed later.

d. Flexibility related to Computer Simulation

The flexibility for computer simulation forms another important feature of econometric approach. The latest achievement in computer capacity has facilitated to produce quite easily various alternative plans from the same econometric model. Thus it makes possible a kind of conversational use of the model at the request of various groups with different social preferences. This operational neutrality has proved to be essential to scientific policy-making.

e. Rolling Plan System

The last important merit in econometric approach is the advantage in implementation and revision of the plan. The deviations between actual and predicted values can be easily analyzed by distinguishing their causes in quantitative terms into those for data, policy instruments and model itself. This type of approach also facilitates a "rolling forecasting system" in which the plan is periodically revised on the more updated and realistic assumptions on data and policy variables.

The planning model itself can also be periodically improved in this system.

As details of model structures and results of projection are given in the 4th report by the Committee on Econometric Methods.[3], we shall only deal with the basic features of the present planning models.

In the following we shall discuss mostly on the officially used models in the formulation of the Basic Economic and Social Plan.

1. Long-Term Projection Models

a. Two-Sector Long-Term Model[12]

As noted above, Two-Sector Growth Model was constructed by Prof. Ueno and his group in 1964 in the context to the Medium-Term Economic Plan and it has been developed further jointly by the Planning Bureau and Economic Research Institute of EPA. This annual model has two sectors: primary sector and non-primary sector and is based on long-term historical time series for 1906 - 1968 (excluding 1938 - 1953). Production functions for the two sectors and saving function have played an important role in forecasting the growth potential of the Japanese economy. This model was elaborated further in collaboration with Japan Economic Research Center by introducing additional structural equations for business investment, prices and demand for money. The model was employed for long-term projection for 1985. [2], [12]

Although the model was not officially used in the present plan, the results served much as a reference for long-term forecasting.

b. Comprehensive System Model

In formulating the Basic Economic and Social Plan, reference was made to the results of simulations done with the Comprehensive System Model (annual model) newly developed by the Economic Planning Agency as a tool for indicating long-term developmental trends to approximately 1990. Rather than being a model which explains short-term changes in the economy and is intended for simple forecasting, the Comprehensive System Model is a long-term, econometric model designed to yield a consistent understanding of the economy and the society as well as an outlook on how policy management in such fields as (a) controlling pollution, (b) strengthening the social overhead capital, (c) improving housing conditions, (d) expanding social security services, (e) shortening working hours, and (f) securing an equilibrium in the international balance of payments affects on the long-term economic structure.

The first major feature of this model is that it is constructed to perform coordinated analysis of the demand structure and supply structure for each industry. The second feature is that the variables relating to pollution are introduced into the model to make it possible to grasp the interrelation between pollution-control activities and economic activity. The third

feature is that it is designed so as to make it possible to grasp the direct and indirect influences of the social overhead capital upon both supply and demand aspects. The fourth feature is that it is possible with the model to analyze the effects which the various policy managements noted above will have on the long-term trends in consumption, investment, imports and exports, and other areas.

## 2. Medium-Term Macro Model - 1973

### (1) Objectives

The Medium-Term Macro- Model - 1973' has provided the foundation in the formation of a macro-economic frame-work in the Basic Economic and Social Plan. It is a Keynesian-type demand-oriented policy model mainly designed to consistently forecast what a most desired state of the national economy will be like in the target year under the combined set of data and policy variables. The model has been used also for systematic follow-up analysis of deviations between planned and actual performances in the course of implementation of the plan. [10]

### (2) Structure of the Model

The Model is composed of 35 structural equations and 37 identities. Its structural parameters, in principle, are based on semi-annual data centering national accounts and related statistics from FY 1954 to 1970.

In estimating the structural parameters, two-stage least



squares method was employed. In the Model there are 117 variables of which 72 are endogenous variables and the others, 45, are exogenous variables. Major endogenous variables are as follows: GNP and GNE with components (in nominal and real terms), national income and its distribution, wage rate, various kinds of deflators and many other items falling on the private sector of the national income accounts; potential GNP, capital stock, labor demands and other items relating to production; interest rates, increase/decrease of bank loans and other monetary variables; and demand/supply gap of GNP, unemployment rate, surplus of trade balance, balance of government revenue and expenditure and other balance items.

Exogenous variables are classified into policy variables and data variables. Among major policy variables are government fixed capital formation, government consumption, transfer income, social insurance contribution, current subsidies, official discount rate, Bank of Japan credit, increase or decrease of government bonds owned by financial institutions, charges on public utilities, reduction of direct taxes on households, corporate tax rate, indirect tax ratio to GNP and exchange rate of the currency; and variables relating to world trade, import price and labor force are given. In addition, 26 predetermined endogenous variables are introduced in order to explain the dynamic path of the economy.

The model can be divided, into five blocks: (1) the real

expenditure block, (2) the price-wage-labor block, (3) the current expenditure-income distribution block, (4) the monetary block and (5) the production block. The financial block and the production block are rather recent development. Associated with the introduction of these two blocks, the other ones have been necessarily improved as these five blocks are closely interrelated.

### 3. Interindustry Model [ 7 ]

#### (1) Objectives

In the Basic Economic and Social Plan, the target figures by industrial sector were estimated in consistent with the macro target figures with "Interindustry Model-1973". The principal purposes of this Model are; first; to estimate demands (intermediate demand and final demand), production, import, employment, capital stocks, etc., by industrial sector respectively, maintaining consistency with the aggregate estimates of final demand derived from the Medium-Term Macro Model; second, to check the aggregate estimates on production, import, employment, etc., in their feasibility from the aspect of sectoral basis and third, to analyze effects, by industry, from allocation of government investment and foreign trade policies. Although the estimates for aggregative final demand are given by the Medium-Term Macro Model, an experimental study has been attempted in integrating both macro- and interindustry models in order to

assess both long-term growth potential and fiscal-monetary demand management. [6], (Chapt. 5 of [2] )

(2) Structure of the Model

Table 7 presents a structural outline of the Interindustry Model. It is basically a static and open Leontief model in which output, import and value added, etc., are estimated by industrial sector on a basis of sectoral final demands and input co-efficients. In the first step, the aggregate expenditures by final demand components (private consumption expenditure, fixed investment by private enterprises, export and, etc., all given in real term) derived from the Macro Model are divided into 60 sectors by using several kinds of econometric sub-models or converter matrix such as the consumption function by commodity group and the export function by commodity group, etc.

In the next step, by giving the values of those divided final demand, the values of intermediate products and imports by sector are computed through the input coefficient matrix adjusted for forecasting use and through sectoral import functions by means of an iterative method of convergence calculation. In the final step, by giving the values of those total output by sector, demands for fixed capital stocks and workers of twenty sectors are estimated through the econometric sub-models such as private fixed investment functions and labor demand functions.

As indicated above, the model is characterized by the followings:

(1) it is linked with the Medium-Term Macro Model in use, (2) various econometric sub-models are utilized to divide aggregate final demand components into different sectors and to estimate capital and labor requirements by sector, (3) the input co-efficients are adjusted for forecasting use, taking account of their time trend, and (4) total output and imports by sector are consistently calculated through the sectoral balance equations for demand and supply and import functions by means of iterative calculation.

In addition, the Model can be utilized for policy making in economic planning. For example, breakdowns of government consumption expenditure for public health and education and of public investments such as those in projects related to road, port, river and mountain conservation, transportation and communication, are all available as policy variables and they can be used for detailed policy simulations; further, it is so designed as to adjust some of the parameters of import functions as policy parameters. Thus the impacts of trade liberalization can be analyzed in details.

It is also possible through the use of the sub-model to estimate the commodity-wise production in terms of physical units and production indexes classified by industry.

In the present version the basic data on production and import were revised on the basis of 1965 prices (obtained from Interindustry Table in 1965) to maintain the consistency with the Macro Model and also input coefficients and parameters such as converters were up-dated to certain extent.

Lastly, it needs to be mentioned that the model has been expanded, after the formulation of the present plan, to include interindustry price-cost relationship with special reference to pollution impact analysis at 60 sector-level. Over 6-year period the impacts of pollution control were analyzed by 6 different types of pollutant. The time pattern of expansionary impact of anti-pollution investment and contractionary effect of price increase by internalization of external costs were analyzed separately over the planning period by different sectors. [9]

Table 7 The Simplified System of Interindustry Model

The system of equations of the model can be simplified for illustration purposes as indicated below.

$$(1) C_i + G_i + I_i + J_i + E_i = F_{di} \quad (i, j = 1, 2, \dots, 60)$$

$$(2) X_i + M_i = \sum_j a_{ij} X_j + F_{di}$$

$$(3) M_i = f_i (X_i + M_i)$$

$$(4) \sum_i X_{i(j)} = X_j \quad (j = 1, 2, \dots, 20)$$

$$(5) I_{pj} = f_j (X_j, K_{pj-1})$$

$$(6) K_{pj} = K_{pj-1} + I_{pj} - R_{pj}$$

$$(7) L_j = f_j (X_j, K_{pj-1}, L_{j-1})$$

$C_i$  : Consumption expenditure by type of product, on 60-sector level

$G_i$  : Government purchases of goods and services by type of product, do.

$I_i$  : Gross fixed investment by private enterprises and personal residential construction, by type of product, do.

$J_i$  : Change in inventories by type of product, do.

$E_i$  : Exports of goods and services by type of product, do.

$F_{di}$  : Final demand by type of product, do.

$M_i$  : Imports of goods and services by type of product, do.

$X_i$  : Gross output by industry, do.

$X_j$  : Gross output by industry, on 20-sector level

$I_{pj}$  : Private fixed investment, do.

$R_{pj}$  : Replacement, do.

$K_{pj}$  : Gross private capital stock by industrial use, do.

$L_j$  : Employment by industry, do.

$a_{ij}$  : Input-output coefficient, on 60-sector level

## C O N T E N T S

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— The Case of the Present Plan (Basic Economic and Social Plan)
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- V. Instruments for Plan Implementation
- VI. Methods for Formulation of Consistent Development Targets

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