ECONOMIC DEVELOPMENT AND ECONOMIC PLANNING

by

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This paper is written as a report of my research work at the Center for International Studies, Massachusetts Institute of Technology. Owing very much to the activities of the Center (Professor M. Millikan, Director) I have arranged the problems of economic development and its future planning in the light of international comparison and thus made the standpoint of the Japanese economy clear.

The reason that I considered this problem was to propose a substantial project for the theory of economic development which is now aiming at systemization of itself, and thus from the practical point of view, propose a theoretical policy to the present economic policy which seems very unstable now having not been totally realistic.

This paper would not have been accomplished if there had not been useful guidances and comments from many economists here at the Center and the Economics Department of the Institute. There have been so many people to whom I owe thanks, that I can hardly write all their names. Above all, I am very much obliged to Professor E. E. Hagen who has been so very cordial in helping my study in spite of
his own busy daily work. If there is anything useful in this report, it is due to the great help of these people and not to my own effort.

However, all opinions mentioned here in this report are quite personal and have nothing to do with the Center, the Economic Planning Agency of Japan to which I belong, or the Rockefeller Foundation who has been kind enough to support my study.
In men, for example, a usual and convenient measure of growth is height, but along with increase in height, some changes in weight, shape, intellectual and physical capacities, glandular activity, and a host of other aspects of body structure and functioning. Moreover, height by itself is frequently a misleading measure of growth, particularly when comparison is made between men of different cultures.

C. P. Kindlesberger
Chapter I
INTRODUCTORY

The Purpose of the Study

The tendency to manage the economic activity by means of a long-range project deliberately has become much more common nowadays. And we cannot ignore the development of theoretical exploration in this field behind this tendency or along with it.

Studies titled with the name of economic development, economic growth or economic planning become the urgent ones which the people who study or have interest in economics have to face.

Modern economics that was established by F. Quesnay for the first time and was polished theoretically as a social science by A. Smith, through D. Ricardo and R. Malthus, has been criticised completely by K. Marx and his successors on the one hand, and at the same time it has been deepened skillfully by Lord J. M. Keynes and his school on the other hand.

But, after the time of the Neo-classical school, economics became more and more "economics of economics" to such an extent that it devoted itself to the work of "zenith". Needless to say, the fact must be highly appreciated
that this Neo-classical school and its immediate successors succeeded in deepening and in widening the problems which their forerunners brought forward, making the tools and methods of economics elegant in theory. But, in spite of these highly laudable contributions to economics, their attitude brought the theory a certain kind of danger that might force economics to lose its principal objectives, as when applied pragmatically.

The theory of economic development, defending economics from this danger, has appeared bringing up the social significance of economics once again.

Here in this report I can not refer to the history of the theory of economic development further, but, for the time being, I would like to suggest the recent book by Meier and Baldwin, Economic Development which summarizes the general history dexterously. In it, they trace the history from Classical-school (A. Smith, D. Ricardo, T. R. Malthus and J. S. Mill) through Marxian-school (K. Marx, F. Engels and N. Lenin) Neo-classical school (A. Marshall) J. Schumpeter to the post-Keynesian (L. Harrod and E. D. Domar). They seem to have succeeded in making the points of these theories are clear, although there are some insufficient explanations (such as a lack of proper appraisal for F. Quesnay's achievements and incomplete interpretation of K. Marx's Reproduction-table).
It is my opinion that the history of the theory of economic development can be divided into two parts; before and after Schumpeter. And hereafter, when I use the phrase "the theory of economic development" I mean the theory of post-Schumpeter, in other words, in its narrowest sense.

According to this classification, we may regard Harrod and Domar who are both post-Keynesian as the forerunner of the theory of economic development. But, from the theoretical point of view, in the analysis of the early post-Keynesian, their objectives were limited, not only historically but also regionally. (This means merely a natural conclusion of the proposition that the theory is variable as the object changes historically, and it does not mean underestimating their contributions to the theory of economic development.) Meier and Baldwin write as follows: "Most economists have analyzed the development problem with a vision derived from the experience of Western capitalistic countries where rapid growth was already under way." 1

The people who have brought maturity in the field of the theory of economic development with traditional ways of thinking and faced the practical problems, have been those who devoted themselves to the problems of the

transition from ruin to rehabilitation after the War and in the time of innovation. A stratum of this group spreads widely and has different political standpoints and stresses different theoretical points such as sociological, psychological or technical, so that we can hardly regard them as a single group.

I will refer to these different standpoints and different policies which they have proposed so far. But, in spite of their different points, there seems to be a common "ring of debate."

First, we have to take account of the practical features of these groups. The pedants, the transcendentalists and any others who had had no reality could never have attracted these modern people. The transition from war to peace, dramatic reivalry between capitalism and socialism, conspicuous divergence between the advanced countries and the underdeveloped countries, unexpected technical progress, formidable regularity entwined about business cycles; these realities of this living world have forced economic study to have reality. Economics has no meaning without "reality."

Second, we will see the enlargement of the fields of economics. In the case of the old "economics of development,"
the objects of study were limited within Western capitalism. They mainly dealt with the development which appeared along with business cycles. Even when dealing with other foreign countries, they regarded these countries abroad as markets of Western countries. Although it is true that, some economists deal with the problem merely from their own country's development point of view, or regard foreign countries merely as markets of the Western countries, it becomes more popular nowadays to take account of the problem of development of underdeveloped countries themselves, or as the problem of group-area or group of common interest.

This means that, as a matter of course, people theoretically become more interested not only in the process of the business cycle but also in the problems which proceeded the business cycle: such as how to bring continuous growth from stagnation or as to which sector should we invest primarily.

The third is the tendency that the economists are coming to use not only economics but also many other adjoining social and natural sciences in analyzing and systematizing the objectives. This is quite natural when we think of recent phases of broadening objectives and phenomena becoming more complex. And thus, the borderline
between economics and other sciences becomes vague, and this trend will continue further.

For example, in modern economics, we need the extensive help of mathematics in discovering and applying the regularity of given functions. Today, we can say that economics itself is being "econometricized" rather than that econometrics is a part of economics. Further, economics needs understanding of mechanical engineering to advance the mathematical analysis; of the mechanical system as a driving force of development and also understanding of discoveries of new energy such as atomic power and so forth. These kindred sciences are becoming more and more indispensable today. Ideological economics is no longer of use.

Moreover, as the objectives enlarge, especially as the interest of economists are directed to underdeveloped countries, there appear, with tremendous persistence, non-economic factors sometimes promoting and sometimes interrupting development twined about economic structure. To understand these functions, we need the help of sociology and psychology.

As an inevitable consequence of such study, the emphasis on history has become flourishing. It is required that
we observe economic phenomena not only in modern dynamic capitalism but also in the long-range history.

This contact with other sciences has organized research efforts and cooperation among researchers in the field of economics. The majority of the fruitful contributions of recent works in the theory of economic development have been done by systematic research organizations. For instance, we have divisions concerned with the U.N., CIS of MIT, or the RCEDCC of Chicago University (Research Center in Economic Development and Cultural Change) etc. as its example.²

Fourth, it may be said that the economics of development ends its task in the form of political proposals for government or for a group of nations. For instance, we have the Millikan-Rostow Proposal as a private proposal, U.N. proposals as groups and almost every country has its own program for future development whatever it might be called: plan, project or program. These facts show that the last chapter of the economics of development should be applied to proposals.

The theories of development, standing on various interests, are varied and abundant. However, this never means that the key for solving the development problems

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² About these organizations, see Wolf and Sufrin's Capital Formation and Foreign Investment in Underdeveloped Areas, p. 114-117.
has been found already. Everything is, as Professor Kindleberger says\textsuperscript{3} too complicated and the problems which remain unsolved or require more careful investigation come out one after another. Moreover, it seems that the more we proceed the more the questions arise, in this field of science. The role of the "theory of development" is endless and unfinished as long as the very simple but very obstinate desires of human beings exist; those of increasing their income and raising their living standards.

My following considerations, facing these phenomena just mentioned, are neither to criticise them nor to present a new proposal instead of more theories. It must be recognized that "Anyone who claims to understand economic development in toto, or to have found the key to the secret of growth, is almost certainly wrong."\textsuperscript{4}

The author's intention is merely to touch upon things which these people have not considered seriously or to rearrange the materials from other aspects that they have not tried.

Outline of the Study

This paper consists of three parts.


First, I shall examine what we should consider in placing Japanese economy properly in the course of economic development. To deal with this problem, we have to learn the attitudes of various economists on the theoretical history of economic development in evaluating the process and pattern of economic growth country by country. There, we have to examine the measuring method of development briefly. And then, I would like to present to the readers an hypothesis: "Japan is neither an advanced country nor an underdeveloped one, but is a 'semi-advanced' country which has its own specific features and patterns of economic development."

We need not be too rigid in this step (in Part I) because we are just advancing it as a hypothesis which will be augmented in the following parts by case studies.

The next step (Part II) is to make an industrial comparison.

The economics of development have been lacking in substantial analysis of industry so far. But, the theory of development will never reach full maturity without having due industrial analysis. Although there have been many studies on industry so far, few of them have been done from the comparative study point of view, placing the industry
in the course of economic development as a whole. Here in this part, I will make an international comparison of industry taking the iron and steel industry as an example. This is one case study and is limited to only three countries. As it will be suggested later, we have to add more case studies as many as possible, not only in industries but also in countries.

Therefore, the international comparison which I am trying to make here is not a final conclusion but merely a tentative trial. I would like to compare the iron and steel industries of the three countries using Professor Hagen's OFRID as a tool of analysis and then examine to what extent the hypothesis "Japan is a semi-advanced country" is evident.

The third step (Part III) is to suggest further study concerned with this theme and then to present some basic principles in making economic plans in a semi-advanced country if the hypothesis is to be proved correct principally in the second part.

The point in this part (Part III) is that: There are "generalities" and "specifics" in every national economy, and so should there be in economic planning.

Planning is always the last chapter of the theory of development. The theory which stresses the importance
of the "Invisible Hand" has still some reality even now. But, there may exist a philosophy which relies on the "Human Hand" more than the "Invisible Hand" or they may be one who believes our action to make the "Invisible Hand" more effective. The author himself believes it is the time of "How planning" and not "Why planning."
Chapter II
TOO MANY PROBLEMS

Confusion in Literature

In order to solve the problems of economic development, we have to understand, first of all, by what standard we can measure the degree of development. Today, it has become a common sense to classify it by the words advanced and underdeveloped countries. But, it is troublesome to define what these words mean.

The definition itself, I believe, is rather meaningless. (Arguing the differences between developed, progressive, and advanced or distinguishing underdeveloped or less-developed from backward etc.) However, we should realize the content of these words from the point of view that "policy depends on the objectives."

Here we meet with some confusion.

I have always had an interest in the group in which our modern economists have included Japanese economy. In this point, I have been annoyed by their views. Let me take some examples from the discriptions of three famous scholars in the world.
Professor Samuelson regards Japan as being "medium level" by using Staley's data from the viewpoint that a distinction between developed and underdeveloped is made mainly by the level of per capita income. It looks like it is very understandable. But, he says in another part of the same book, that Japan has become a "first rank" industrialized country, marking a rapid growth in a short history.

Professor Hagen defines economic development as not a matter of the level of per capita income but of growth (particularly, continuous growth), so that the Japanese economy is highly appreciated. He, referring to this point, says, "In this important respect, Japan and Colombia are more nearly like the United States than like Burma or Egypt: their difference from the United States is one of degree, from Burma or Egypt one in kind."

Professor Kindleberger, who is also one of the brilliant economists of our time, regards Japan as an underdeveloped

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2. Samuelson, Economics, p. 753.
country from the viewpoint of the level of per capita income on the one hand, and also regards it as an advanced one from the point of investment quality. He says, "Yet, it is troublesome that Japan, which we regard as having been through the development process, has such a low income per capita. Is Japan developed or not? With $200 per capita of income in 1953, it ranked with Mexico, Yugoslavia, and Costa Rica as an underdeveloped country; and yet it has scale, undergone transformation, and formed capital in cumulative fashion, which is the essence of the developmental process."

It is certainly unfair to cite some lines independent to a whole story, yet we feel some confusion in these expressions as far as Japanese economy is concerned.

Fortunately or unfortunately, I could not find this time the literature in which Japan is defined as a typical underdeveloped country, yet it is very possible judging from my personal contacts with some foreigners (and also with some Japanese).

But, the problem is not to which group Japan has belonged but why and by what criteria. In other words, the problem is not the result but the reason.

case of Professor Samuelson, hesitation in regard to Japan as an advanced country comes from his analytical point of view, and Professor Hagen's view is derived from his evaluation of motivation and continuation. Professor Kindleberger has met some troubles in deciding whether it is an advanced or an underdeveloped country from his international competition point of view.

I would not like to go further about these views. My intention is merely to point out the difficulties and complexity of the problem.

How Approach the Problem

Now, what shall we regard as the criteria?

The next table shows typical features of the three groups (advanced, semi-advanced, and underdeveloped countries) by simplifying the points which some representative economists have emphasized. This simplifying is done by my own judgement and it does not mean that these economists themselves have arranged their views in this way.6

As you see in the second column, the criteria which determine the distinction between advanced, semi-advanced

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6. I owe very much to the discussion with Professor Itagaki in making this table. See also, Y. Itagaki and J. Sakamoto, "The Problems of Underdeveloped Countries" in Introductory to Economics, (Tokyo, 1958) and Y. Itagaki "Some Notes on the Controversy Concerning Boeke's 'Dualistic Theory'" (Draft. CIS, MIT, 1958).
As you see in the second column, the criteria which determine the distinction between advanced, semi-advanced and underdeveloped countries are different for each economist.

These criteria can be classified into some groups by some standards. For instance, Professor Itagaki has classified them in the following groups; economic approach, sociological approach and international relations approach.

Economic approach means, by his classification, the methodology based on income analysis so that it begins with the concept of per capita income. The economists of the U.N. and many others of the modern Keynesian school belong to this group. They discuss the problem of development by quantitative concepts such as income level and then propose economic program such as to what extent should the rate of savings be raised or how much should be spent as investment in order ultimately to raise the level of per capita income. Patterns of development are determined also by those factors concerned with "income determination."

In contrast to this view, some people emphasize socio-political factors which promote or interrupt the development, especially in underdeveloped countries, much
more than purely economic factors, denying the importance of the "income determination theory." These people are called the school of "sociological approach" by Professor Itagaki. Boeke and Furnival are examples.

The third view, "international relations approach," stands on a viewpoint that development of a given country can never be determined by its own economic structures or by its socio-political factors but is influenced strongly by its relative position in international relations. They discuss the problem of development from a point of view that development of underdeveloped countries is determined not only by the current economic policies of advanced countries but also by the past colonial policies of imperialism.

This classification may have some dangers of leading to formalism although it is convenient to understand the differences of patterns and structures of economic development. But, we have to pay attention to the fact that today, as a result of advancement in the theory of development, almost none of the economists emphasizes the economic factors solely. Now a new tendency can be seen among a group of keenly interested economists who try to get economic (more or less quantitative) expression for socio-political factors.
For example, Professors Higgins and Hagen, who may be classified in the school of "economic approach" by Professor Itagaki's classification, show strong interest in socio-political factors of economic development, and search the relationship between economic factors and noneconomic factors; through Indonesia by Professor Higgins and through Japan, Colombia and Burma by Professor Hagen. The tendency to overemphasize some economic factors and to make policy by a too simple quantitative model (such as once seen in literature of the early U.N.) has already disappeared. Professor Higgins says that "the final task will be to unite the economic and sociological approaches in a study of more deep-seated factors in economic growth." 7

It becomes quite foolish to measure a degree of economic development with a few simplified quantitative criteria in a day when economic studies are done by coordination of people in many other fields of science and culture. There would have to be many "exceptions" in every country if we had them classified by only a few criteria.

Therefore, although it may be rather troublesome, we have to apply these criteria briefly at first, then proceed to a case study, and finally re-examine those criteria which we used at the beginning. There is no short-cut way in learning.

I will arrange some aspects of approaching the problem by appraising the contributions of our pioneers. These aspects are: (1) Quantitative aspects of stages of development (2) Motivation and initial stage of development (3) Factor endowment and mechanism of movement (4) Non-economic factors and (5) International relations.

Quantitative Aspects of Stages of Development

Everyone who has learned economics knows that List, Hildegrand, Bucher and Wagemann established their theories.

8 In order to discuss these five subjects, some fundamental factors relating to development have to be arranged. Following OFRID (Outlinge of Factors Relating to Industry Development), we may make OFRED (Outline of Factors Relating to Economic Development), like this:

(1) Population (number, density, growth rate, birth rate, death rate)
(2) Land (area, cultivated area, land productivity, area per capita).
(3) GHP or NNP (gross, net, per capita, growth rate).
(4) Capital formation (gross, proportion to GNP, proportion of inventory, capital co-efficient).
(5) Consumption (gross, per capita, proportion to GNP, growth rate).
(6) Industrial Structure (proportion of industry by production and employment).
(7) Foreign trade (Export--gross in term of $, proportion to world export structure and growth rate).
(8) Foreign trade (Import--gross in term of $, propensity to GNP, import structure).
(9) Labor force (total force, rate of labor force, unemployment, rate of unemployment and hours of working).
(10) Others (Consumption per capita, of energy, steel, textile and calories; Engel coefficient, construction of residence, road conditions).
(11) Noneconomic factors (Illiteracy, physician per population, educational expenditure, military expenditure, circulation rate of newspaper etc).

Though there remain many doubts, the author tried to arrange the data in "appendix."
by making some "economic stages" in discussing the development (through the world they faced was quite different from today's in its nature) and also knows that these theories have failed to explain the real problem, being faced with too many exceptions.

Nothing is explained when we say that the economic stage shift from "lower (or earlier) stage" to "higher (or later) stage." The words "low" or "high" are relative concepts, much more is intermediate stage. It is impossible to point out the intermediate point as something absolute. Where is a midway point between New York and San Francisco; Chicago? New Orleans? or somewhere in the desert?

After them (Hildebrand and others), three economists have made other important classifications by using the same method (stage-theory). They are W. Hoffmann with "degree of industrialization"; C. Clark with "industrial composition"; and S. Kuznets with "income comparison." They all have tried to express the stages by certain quantitative factors.

Hoffmann established his theory regarding manufactures as fundamental promotor of development and emphasizing the shift from agriculture to manufacturing industry in economy as a whole in the course of development.
C. Clark, also taking account of the transition of industry as Hoffmann, stressed the shift from primary industry to secondary and then to tertiary rather than the shift in the manufacturing industry.

These two theories--Hoffmann's and Clark's--are stage-theories to some extent. But, they are quite different from the former paying attention to quantifying the economic factors in modern terms and thus succeeded in leading to new development theories.

However, they only found a clue to a new field, and the problem of proceeding with the study has been left to their successors; the problem such as why development began? what mechanism they have? how varied they are?

Professor Kuznets is the first man who appeared in this field by analysing the national income of various countries. He, being more careful than Clark, pursues not only the general features of industrialization but also the factor endowment, domestic conditions and some international comparison.

On this background mentioned above, many economists try to develop the study of this field nowadays.
The methodology of classifying countries into advanced and underdeveloped (and into semi-advanced), is to some extent a kind of "stage-theory," but not in a rigid sense. Again, the words "advanced" and "underdeveloped" are relative concepts and have no meaning by themselves. And more than that these words do not always show the stage of development but they show some fundamental features of development, in other words, some structural features. In this respect, quantitative analysis has begun to have an important role.  

When we use income level (as a whole or per capita), for instance, as a criterion of classification, the result implies some stage of development. However, income level itself shows almost nothing, though it is basically one of the fundamental procedures to approach the problem. As we see in Professor Kindleberger's indecision, classification by per capita income has less meaning, and it

9. Every economist since Quesnay had or has had an interest in making a kind of "stage-theory" or in using a certain quantitative expression. K. Marx, who paid attention to the process of industrialization as others did, tried to demonstrate quantitative economic model (with such terms as "Organische Zusammensetzung" and "Erweiterte Re-produktion"), regarding the problem of the shift of economic systems. Lenin developed his theory in the international phase by "Imperialism."

Marx's theory, especially his development one, is as Schumpeter remarked, highly notable in this field, although it has often been misunderstood or overemphasized dogmatically or politically both by his successor and his opponents. It is difficult to take up the purely economic aspects apart from political propaganda and prejudices. As for noneconomic factors, Marx and Engels also contributed theoretically to the theory (e.g. "zur Kritik Der Politischen Ökonomie"). But I will not deliberately refer to them at this time.
may annoy Professor Samuelson who regards it as fundamental to face the fact that Soviet Russia is placed in the middle-group (near to underdeveloped).

After World War II when the problem of economic development in underdeveloped countries had arisen in the economists group such as the U.N., the argument that underdeveloped countries are defined as low income countries had prevailed. But, such crude arguments have already disappeared even in the U.N.

Besides the growth of the rate of income, its distribution, its reversion, its continuity and the mechanism of its growth have come to be counted as basic problems. And furthermore, critics of starting from national income have been arisen among psychologists and sociologists who insist that such methodology as starting from income analysis only leads to a wrong conclusion like "everything is resolved by increasing income level" which is especially unadoptable in underdeveloped countries.

I myself think that we have to start from income analysis wherever its conclusion may be found. On this quantitative understanding the discussion of many problems, as will be mentioned later, must be done. National income (as a whole or per capita) is observed as aggregate to these various factors, each of which has important meaning itself.  

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10. When we use income level, the distinction between gross and net, economy as a whole and per capita, average and in special groups, etc. must be made clear case by case. Usually, in making comparison, net income per capita is used.
The difficulties in getting figures for international comparison are often discussed by economists; like (1) the basis of income theory is not universal. (2) differences in original data—nature, definition, method of calculation, etc. (3) differences of value for goods and services and also for noneconomic factors. (4) reliability in original data, especially in underdeveloped countries. (5) difficulties of price comparison at a given time, especially in the case of exchange rate determination.

Thus, quantitative analysis includes many difficulties, yet it seems to be fundamental in this field of study.

Motivation and Initial Step of Development

One of the remarkable tendencies of recent study in the field of economic development is to stress the importance of the motivation and initial step of development.

Those people who study in this manner are never contented with such a simple approach as classifying advanced and underdeveloped merely on the basis of the national income level. They understand development as something historic, dynamic and continuous. In this respect Professor Hagen says, "By economic growth I mean continuing rise in per capita income." And Meier-Baldwin write, "In defining economic development as a process whereby an economy's real national income increases over a long period of time,

<table>
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<tr>
<th>Source</th>
<th>Criterion</th>
<th>Advanced country</th>
<th>Semi-advanced</th>
<th>Underdeveloped</th>
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<td>Leffmann</td>
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<td>3-4</td>
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<tr>
<td>A.H., Staley,</td>
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<td>More than $450</td>
<td>$150-450</td>
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<td>Samelson</td>
<td>Agricultural population is less than 30%</td>
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<td>Singer</td>
<td>Population component by industry</td>
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<td>Pattern of export</td>
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<td>Nurkse, Clark</td>
<td>Condition of capital</td>
<td>Over capital (high income, low</td>
<td>Difficulties in capital formation (medium income, high savings and high productivity)</td>
<td></td>
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<td></td>
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<td>savings and high productivity)</td>
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<tr>
<td>Viner</td>
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<tr>
<td>Thompson</td>
<td>Growth rate of population</td>
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<td></td>
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<td>low death rate)</td>
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<td>Nurkse, UN Emerson</td>
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<td></td>
<td>Spirit for development</td>
<td>Modern and maturity</td>
<td>Modern and developing</td>
<td>Pre-modern or stagnant</td>
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<td></td>
<td>Social structure</td>
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<td>Homogenous (dual society)</td>
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<td>Adaptance for competition</td>
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<td>Marxists</td>
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<tr>
<td>Hegen, Rostow</td>
<td>Process of growth</td>
<td>Continuous growth (maturity + durable consumers goods &amp; services)</td>
<td>Continuous growth (take-off + continuous growth)</td>
<td>Stagnant (the traditional society + pre-conditions for take-off)</td>
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</table>
we should underscore for special attention the words 'process', 'real national income' and 'long period'." 12

This methodology, as a matter of course, has such typical features as (1) history is carefully investigated (2) the facts are not only collected and arranged but also knitted logically (3) pays attention to social phenomena as well as economic phenomena and (4) attaches importance to the initial stage and transition period.

Although it becomes urgent both in advanced countries and underdeveloped ones today, the problem of development has a different meaning to them. In advanced countries, the point is how to maintain an optimum growth continuously, and in underdeveloped countries, is how to begin and to accelerate the initial growth. Consequently, it is again a matter of course that economists who attach importance to motivation and process have come from those who have had interests in the problem of underdeveloped countries.

In this respect, the work of the CIS staff of MIT may be highly appreciated, where Professor Millikan is in charge of development studies in various countries (or groups).

Here Professor Rostow analyzes the process of development dividing it into Traditional society, Pre-condition, Take-off, Maturity, and Durable consumers goods and thus established his so called "take-off theory." He emphasizes the stage of take-off where the development starts regularly. His analysis has characteristics in pursuing innovation, grouping industries into three groups; primary growth sectors, supplementary growth sectors and derived growth sectors, the first of which has been emphasized in the time of take-off. His theory resulted in many political proposals such as the "Millikan-Rostow Proposal." To make his incompletely effective numerous facts from underdeveloped countries will undoubtedly be considered and arranged.

Professor Hagen shifts his interest from his early model of purely economic analysis to various noneconomic factors in the course of economic development, taking evidences in the history of England, Japan, Colombia, and Burma. He aims to establish the "Economics of Transition." He uses many terms of psychology and sociology, transferring them into the terms of economics in addition to his profound knowledge in modern economics. Although his theory


14. Millikan and Rostow A Proposal: Key to an Effective Foreign Policy.
has not been fully systematized yet, it is worth attention. His analysis begins at the point where continuous growth begins and tries to find the barriers of growth and how to take them out of normal development. 15

Thus current studies at the CIS include various fields concerned with the problem of development.

Factor Endowment and Mechanism of Development

It is common in analyzing economic activities to regard some factors as "given."

It is also common, in that case, to regard land and population as given. But, this is not always true in the case of development study, saying nothing about static analysis. History does not always present evidences that the wider the land is, the more the advantages for development and that the law of diminishing returns works just as theory.

The size of land does not determine development itself but just determines the method of development. It is important, to make economics progressive, to know that the size of the land is advantageous only in a constant condition and that we can get the same effect even in a smaller land if we change the method of production (e.g., by technical progress).

The same pertains to population. The opinion that population changes as natural phenomena with no connection with socio-economic factors has disappeared today. But, there still remains a view that the abundance of population disturbs economic development. To say that low income per capita has been caused by abundance of population is a kind of "resultant." It has no meaning by itself. On the contrary, population promotes economic development by presenting labor forces and by maintaining consumption. And even in this case, the number of population itself has less meaning than other factors concerned with population: not its natural sides like its structure by ages, or by sex, birth rate, death rate, but other socio-economic sides like adaptance to labor market, regional mobility, class structure, attitude towards consumption are more important. As I will mention in Part III, it is nothing but a foolish political slogan to say about "narrowness of 1% (territory) and surplus population." Although the case is more complicated in underdeveloped countries than in Japan, yet the situation is the same.

Consequently, essential factors to the economic development must be sought from other aspects. 16

At first, we can take account of natural resources. It is true that the more kinds or the more rich resources a country possesses the more favorable its development. It is especially true in the country where the continuous growth has already begun. Still, it is a relative matter as are land and population. The problem is not the amount of reserves but the ability to develop them, in other words, not the existence but the method. India, whose steel industry is less developed than the U.K., Japan or West Germany, is one of the richest countries in reserves of natural resources.

Therefore, we have to take another factor endowment as necessary for economic development: consumption function, saving ratio, mobility of capital, wideness of market, social over-head capital, etc. It is important to understand these factors not individually but in correlation; to understand the mechanism of integration.

In the theories of development, it is generally said that "in order to raise national income, we have to increase investment. In order to increase investment, we have to raise saving ratio. And, in order to raise the saving ratio, we have to cut consumption."

This is a logic of development which is called the problem of capital formation. This proposition, however,
includes many problems which modern economists challenge from various aspects.

Here, I will refer only to some phases of the problems. At first, I will pick up the problem of social overhead capital.

General investment is required for development, but before that, some amount of "accumulation of investment" is required. This is the problem of "Ursprüngliche Akkumulation" which classical school and Marx suggested. The problem has been developed by recent economists in the problem of developing underdeveloped countries relating its possibilities and investment criteria. That is as follows; we can not bring economy to continuous growth unless there exists a certain amount of accumulation of capital, because if we lack it, investment brings only a temporary effect. Rosenstein-Rodan's "Big-push" theory emphasises this point.¹⁷

Social overhead costs mean physically such basic investment as railways, road construction or power development. The sum of these investments offers a wide market on the demand side, and simultaneously it offers capital goods and technology on the supply side and also raises labor mobility. ¹⁸


¹⁸. E.g., Railway network in the U.S., San-kin-kotai or Sakoku in Japan (we may include Fukoku-Kyōhei in this concept).
Measures of capital coefficient or investment criteria must be done together with the study of this overhead capital.

Secondly we must consider the relationships of consumption, saving and investment. Capital formation, the promoter of economic development, is determined by saving which is determined by consumption level. In this aspect, repression of consumption often becomes a top economic policy in underdeveloped countries, just as some economists insisted in early capitalism. But, this is rather a political slogan. The opposite is true; the size of consumption determines the rate of savings. Consumption comes first and saving follows.

In other words, in order to estimate (or to determine) the rate of income growth, we have to estimate the level of consumption first, but not the saving ratio. Estimation of consumption is more important than estimation of saving (investment ability) to estimate the capital formation. If we understand this relation mentioned here, the problem of capital shortage in underdeveloped countries can easily be understood. It is often said that there is no possibility for raising savings by urgent need of consumption. This high rate of consumption can not be cut by force. It has its own reasonable ground.

In underdeveloped countries, it is hard to raise savings and much harder to attain a certain level of capital accumulation, because of 1) stagnation in consumption in low level 2) a vicious circle of low consumption and low level of income 3) social conditions which disturb the change of living manner and 4) demonstration effect. There is a dilemma; to repress consumption, we have to increase consumption beforehand.


20. Incremental income is often consumed in leisure-way disturbed by social restrictions to save them in underdeveloped areas.
We cannot fully comprehend the theory of development as long as we consider these factors independently. Only by observing these factors correctly, can we estimate (or predict) the future direction of market, capital formation, standard of living and so forth.

This will be made clear by doing a case study.

Let me take a brief example. (Suppose the case study to be in the steel industry.) In India, the shortage of capital is supplemented externally, having not raised national savings, and this characterizes the steel industry of India. In Japan, private steel makers were established by mercantile capital on the one hand, and governmental steel plants were constructed by "upper forces" on the other hand. And this duality in the initial stages has become a fundamental feature of the industry since then. In the United States the steel industry has grown up on an affluent social overhead capital and consumption market.

At any rate, these features will be made clear by throwing light upon those factors mentioned above.

Noneconomic Factors

As the fields of economics are enlarged, the border line between economics and other sciences becomes more and more vague. Especially as the econometric methods come to be used more in observing quantitatively social phenomena and individual economic behaviors, this tendency
becomes stronger, though the subjectivity of economics must be kept distinctive.

But, at the same time, we have to pay attention to noneconomic factors which influence, or are influenced by economic development. "There is danger that an economist who ignores social and political factors will attribute to economic forces differences that are not due to economic forces, and will therefore err in his economic analysis. Even though he is not doing research into noneconomic factors, he must understand them, and keep them in mind. The danger that error will result from ignoring them seems to me more serious in the study of economic growth than in any other area of economic research." 21

They cover wide fields: psychological, social and political factors, interrelation among personality characteristics, systems of belief, and social structure (society as a system); motivations, values, world view, traditionalism, religion, nationalism, kinship structure, class structure, legal system, political system, communication pattern and so forth.

The relation and combination of these factors are so complicated that it is hard to touch upon all of these factors here in brief.

The study of history is required to investigate these factors.

Let's use the origin of the steel industry for example. In the case of India, we can see the Indian desire to satisfy their nationalism and to have a "dignity" as a modern nation by constructing this industry. In the case of the origin of the Japanese steel industry we can also see the same disposition in "Fukoku-Kyohei" policy which was used as a slogan to "Enrich the Empire and strengthen the military power" opposing foreign oppression. In the case of the United States, we can see now something like pride in leadership of the free world in this industry (it is also connected with a military purpose to a some extent).

Furthermore, if we look into industry we will find many noneconomic factors promote or interrupt development; such as class structure, social order (which influences the mobility of labor), family system and conception of labor (which affects the wage system or the promoting system) and education or training (which cause differences of skill and nonskill). Or we can see the same thing in "entrepreneurship" which, as Schumpeter suggests, performs an important role in economic development. This "entrepreneurship" has relations not only with personality but also with social structure (school-clan or family system).

Thus the role of the human being which is disregarded in the study of economic development so far, is essential for development.

23. Abegglen, Japanese Factory; Warner and Abeglen, "Big Business Leaders in America."
International Relations

International relations also have an important meaning in determining the growth of economy as well as other factors mentioned above.

These factors influence development from various points; market problems, capital formation, loan-and-lending money, political alliance, etc. We have plenty of literature on this problem.

The classical theory of development, which is based on international division of labor (the theory of comparative advantage cost), presumes some "idealistic" terms, such as mobility of economic functions, equality of marginal productivity of both private and public capital, optimum distributions of labor and resources, free movement of international capital, all of which more or less were lost today.

This principle of free competition in the world trade is faced with some troubles. J.S. Mill's "the benefit of international trade—a more efficient employment of the productive forces of the world", in other words, the phrase that "Unhampered trade promotes a mutually profitable international division of labor, greatly enhances the potential real national product of all countries, and makes possible higher standards of living all over the globe" is a principle which operates only in a case where there is no great divergence in development of various countries.

Here, arises a possibility of protection (the problem which is old but still new!).

The protection is allowed only for a brief period when something is required to maintain (or at least not to worsen) the situation of employment without changing the normal course of development. This protection must be removed gradually (the sooner the removal the better), because the industry which needs protection is often either a "declining" one in an advanced country or in a semi-advanced country or a "hopeless" one in an underdeveloped country.

There is a case where protection policy is approved to prevent the terms of trade from getting worse. But this policy should be adopted parallel with a change of trade terms in such a manner that it will change to more favorable terms changing economic structure in the future.

Anyway, protection policy must be adopted only as temporary aid but not as a permanent one. Protection, by its nature, interrupts or stops development. Particularly, it would be clumsy to protect all industries exhaustively or to try to keep relative prices constant. Changes of relative prices symbolize development, and specialization to a particular industry promises the development.

There is an exception, the case of an infant industry. For example, protection may be allowed to a certain kind of industry in the sense of social over head capital or "big-push" and to a young industry which
has the possibility of competing with foreign countries in the future world market.

As we will see later, the protection policy in Japanese steel industry brought considerable effects to its development, though originally it was aimed at military purposes. But, if the policy would have continued, it would have destroyed the advantages of international division of labor.

In the case of India, it is questionable whether further protection policy for the industry would be effective or not from the viewpoint of international division of labor, in spite of its rich natural resources. Professor Kindleberger says "It is not completely clear that India will ultimately have a comparative advantage in steel-making." He also says "A significant open question is whether Indian entrepreneurship and labor will be efficient in import-competing industries, along with natural resources." 25

These are phases of the whole problem. There are many other phases which will be illustrated by the following case study: the role of foreign capital, export as capital formation, multiple effects of export, etc.

There are also many noneconomic factors in this field. For instance, a protection policy may be introduced for internationally military purposes, or an aid-fund may be expended regardless of its commercial profit. Noneconomic forces bring development sometimes. (E.g., "A fire on the opposite bank" brought boom to Japanese industry after World War I and during the Korean War.)

26. There remain many problems in this field. For instance, we face the problem of "nationalism" or "colonialism" (which relate to the problem of the divergence of development between advanced countries and underdeveloped ones).

Or, some social factor like this: Prof. Itagaki, citing Boeke's theory, points out that the profit of foreign trade (if there is) never falls into indigenous capital but only into Overseas Chinese and Western capital. These are interesting and important.
Chapter III

Hypothesis: Japan as a Semi-advanced Country

Before I make the case study, I would like to suggest in this chapter, what the Japanese economy looks like. Here, I present a hypothesis: Japan is a semi-advanced country. By doing a case study, I will examine it.

Duality in the Economic Structure

It is often said that Japanese economy has a dual character. What is duality? We can define it roughly as follows:

Japan is one of the most advanced countries in a certain sense, having made rapid growth since its capitalism began.

However, in spite of this rapid growth (it may well be said owing to instead of in spite of) there still remains a lot of backwardness. Two parts—the advanced and the underdeveloped—co-exist in the country like a double exposure. This co-existence has never disappeared as the economy has grown. On the contrary, the co-existence itself has become a center of development. The word "semi-advanced" is not a concept of time (something like a stage) but means this duality in economic structure, which of course, should be realized dynamically and historically.

1. Duality here, is duality neither in Doeko's sense nor in Itagaki's or Sakaoto's sense. "Economic Survey" of Japan (1957) used this word and the word middle-advanced (sound unscientific!). But they are either too sociological or too economic. It must be developed further.
This very duality is the most remarkable feature of the Japanese economy, which I call a semi-advanced country.

Let's begin by general observations.

Some large scale industries in Japan have possessed eminently modern facilities and highest class technology. But at the same time, besides these industries, there exist a number of small scale industries and agricultural enterprises with lower—and often extremely low—level of facilities. Economic activities are done in the most modern way in the modern building on the one hand, and in the most antiquated way in the dark shade between these modern buildings.

This curious co-existence of two quite different types, without the older being swept away by the new, makes the frame of Japanese economy. What does this mean?

GNP of Japan in 1956 reached the level of 928.7 billion yen in the production of which 42.5 million workers had engaged, according to official statistics.

Of this 42.5 million workers, 42% were paid workers and the remainder (58%) was self-employed and family workers. A paid worker is one who is nominally employed by modern labor contract, A self-employed is formally a "master" of an enterprise, but he is actually an owner, a manager and a laborer at the same time. Even when he has his workers, he is like a "boss." And, a family-worker
is functionally a laborer who works in production, but he is usually employed without modern contracts and is commonly paid remuneration not as a wage, but as an allowance from an employer (often his, or her, patriarch) and, to our surprise, he sometimes gets no pecuniary reward. And yet, their labor is not easy to do, and labor time is not short. Hard and long labor is often forced by invisible pressure, such as that "the longer he stays at his work shop, the better off he is."

These two categories (self-employed and family-worker) can also be seen sometimes in advanced countries, but they are few and usually get proper wages working as complemental workers. In Japan (and much more in underdeveloped countries) the proportion of these two groups to total employment shows a high ratio making a typical feature of this country.

Moreover, even among paid laborers who are in modern employment relations, most of them have worked in the medium and small scale enterprises. According to official statistics, 60 per cent of the total employees of all industries (except agriculture) were working in the medium and small scale enterprises (enterprise with under 29 workers) in 1954. If we count agriculture, the percentage will show 75 per cent.
Even among the enterprises with more than 30 workers, there is still a certain number of those who work irregularly without modern labor contracts, mainly as temporary workers. If we exclude them from a group of modern and stable laborers, nearly 80 per cent of the total workers in Japan have been working in pre-modern enterprises. Whereas, the workers who engage in the enterprises with more than 300 workers occupy only 10 per cent of all workers. The remaining 10 per cent shift from one to another according to the business cycle (absorbed in large industries in boom, and discharged and absorbed in small scale enterprises or in agriculture in recession).

Value added per capita (productivity) in the lowest in agriculture and the highest in capitalistic sectors; roughly speaking, the proportions are: agriculture 1. small scale enterprises (pre-modern sector) 2. medium enterprises 4. and large scale enterprises (capitalistic sector) 6.

Judging from these figures, we may divide the total production of Japan in 1956 as follows:

- produced by pre-modern sector 55%
- produced by medium sector 15%
- produced by capitalistic sector 30%

These figures themselves show a typical feature of Japanese economy--its duality. We can say the same thing about the capital
invested in these sectors. The amount of capital put into the
capitalistic sectors counted more than that of others.

If we look into the industry itself, we will see remarkable
differences. In the modern enterprises (mainly large scale in-
dustry) 1) the entrepreneur tries to raise the technical level in
order to compete with others both in domestic and international
markets 2) having large scale capacity, the industries become
rather capital-intensive 3) capital-labor ratio (fixed capital
per worker) is higher than others, (that means labor-saving type).
4) Although the level of wages is determined in a capitalistic
way (by productivity and balance of power between labor and
capital) and is higher than in pre-modern sectors, the level of
wages itself cannot usually accompany the growth of productivity
and remain relatively low in international standards, being
attracted by low wages in pre-modern sectors. Low productivity
is covered by this in the world market.

On the contrary, the workers who have missed chances to get
jobs in these modern sectors flow into small scale industries or
into agriculture (pre-modern sectors) where 1) they are labor-
intensive 2) relatively uninterested in technology because of high
propensity to labor, so that less capital is needed and consequently
production remains on a small scale, making a vicious circle.
3) though it looks like a high capital-labor ratio because of the low wage, the ratio is actually low because of the low efficiency of capital and low productivity. 4) Wages are usually low, determined not by living costs (necessary to reproduce) but by the demand-and-supply of the laborer. The reasons the workers stay in these sectors in spite of low wages are: attachment for the work-shop, obligation in the family system, lack of skill on the worker's side or lack of jobs to re-enter. Workers often work overtime of their own accord to cover basic needs, or sometimes lower the efficiencies of labor during working time. 2

This problem includes many difficulties as we see in literature; the problems of under-employment or disguised unemployment. It can not be resolved only by raising the rate of growth. The amount of unemployment, in the Western concept, has no meaning in this case.

Anyway, the coexistence of advanced conditions and backwardness in every field of the same economy is a fundamental fact which must be made clear in the following lines.

This duality in Japanese economy can also be seen in the field of foreign trade. Low level of wages, as we mentioned before, 1) means relatively small consumption and 2) has raised the saving ratio--and hence investment level--and has brought a high growth rate of income 3) capital accumulation in the domestic consumption

2. So that the length of working time (long or short) has no connection with manner (assiduity or idleness).
market is kept in low, and the foreign market is required as a
demander for consumer goods and as a supplier of capital goods.
4) And these situations made it necessary to protect capital goods
producers by government and to have slight and continuous inflation. 3
These relation will be illustrated later, and here I will touch
briefly on the duality of foreign trade.

There are two types of commodities in the exported goods of
Japan. One is the commodity produced by labor-intensive industries
such as the textile and small miscellaneous products which are exported
to the advanced countries as the United States and Canada. The
other is the commodity produced in the capital-intensive industries
as steel, machine and chemical products, which are exported to the
underdeveloped areas such as South East Asia. These relations
(showing the duality clearly) may be roughly summarized as follows:
(in 1 billion dollars)

<table>
<thead>
<tr>
<th></th>
<th>Export to advanced countries</th>
<th>Export to underdeveloped countries</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>labor-intensive goods</td>
<td>0.2</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>capital-intensive goods</td>
<td>1.3</td>
<td>0.2</td>
<td>1.5</td>
</tr>
<tr>
<td>total</td>
<td>1.5</td>
<td>1.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

From where does this duality in the foreign trade field come?

Does it come from the special location of Japan who stands
between the advanced and underdeveloped areas? It is true in some
commodities (like chemical fertilizer), covering disadvantages of

3. Professor Tsuru points out that slight and continuous inflation
helped Japanese economy to maintain rapid growth. Tsuru and Ohkawa
Economic Growth of Japan. (Tokyo, 1956).
production costs by the advantage of transportation costs. But, this is only one phase of the problem.

The main reason is that labor-intensive commodities have advantages for exporting to advanced countries where the wage level is relatively high and where the industries are capital-intensive, while capital-intensive commodities have advantages for the underdeveloped countries where the wage level is relatively low and capital cost is higher than in Japan and where industries are labor-intensive.

Thus, this duality in the field of foreign trade is connected with the duality in the other fields mentioned above.

Specialization in export is needed; specialization not in a single commodity (or the same type of commodity) but in two quite different types of commodities. This is also one of the main characteristics of foreign trade in a semi-advanced country.

At any rate, these various "dualities" have supplemented each other economically and noneconomically, and this coexistence has sustained the economic development of Japan.

Duality and Development

What is the mechanism of development under such dual economy?

It is often said that the key of development is in export attainability which means the import capacity needed to maintain domestic consumption and investment. This would easily be understood
if we think of a function of export in capital formation, propensity of import, multiple effect of foreign trade, etc.

In the United States where reproduction can be maintained or be enlarged stably within its indigenous market, the domestic market is substantially more important than the export market. Particularly the domestic consumption market has decisive influences on its economic growth and stability. (I do not deny the importance of the capital-export of this country.)

In monocultural underdeveloped countries, the export market is important in a sense to secure fiscal revenue (by custom duty) and to get necessary capital for economic development plans.

But in the case of semi-advanced countries (like the Netherlands, Italy, and Japan) export, lacking a suitable domestic market, must cover imports which consist of some basic raw materials and living necessities (like food) physically, and thus they can promote their economic growth by gaining capital formation.

Export has also important meanings from the employment point of view.

In Japan, like other advanced countries, the growth of national income preceded the growth of population when the economy shifted from feudalism to capitalism and when a new relation between capital and labor was established. But after the income has attained a certain level and productivity has increased rapidly, the population increase turns out to be an obstacle.
to development. Particularly in rural areas, the productivity remained lower than in urban areas, and the relatively surplus population gradually increased as disguised unemployment. And this relatively surplus population has kept productivity low in rural areas and they float between the rural (in agriculture or in disguised condition) and urban areas (in small industries or as temporary workers).

In general, the population has a close relation to income growth. Sometimes it promotes and sometimes interrupts the growth of income according to the stages of economic development. In the long-run, population keeps equilibrium with economic growth, and neither the pressure of over-population nor the shortage of population can continue permanently.

At the beginning of (or before) continuous growth, surplus population increases in certain sectors because of differences in productivity. In that case, if there were a lack of mobility in laborers then surplus population would become in turn, disguised unemployment. At any rate, population is relative.

Turning to the population problem in Japan, there is a possibility that it may become worse for several coming years. According to the recent Economic Plan, the population component in Japan becomes the old-age-type; with a decline in birth rate and a further decline
in the death rate. The increase of the labor-population is faster than that of the total population. (During the coming five years, the population is expected to increase by 6 per cent and the labor population by 12 per cent.) It is said that the employment situation will not be improved from its present condition unless at least 6 to 7 per cent of growth is maintained.

In this respect, the problem of export becomes urgent in Japan. Although they have a common slogan, "Export or Death", the ways of increasing exportation are different between the United Kingdom, the Netherlands, Italy and Japan.

Increase of exportation depends on the rate of growth of productivity, and an increase of output by additional labor and capital as far as other factors are constant. There are two ways to increase productivity: dividing it into productivity of capital and that of labor, to increase capital productivity where labor is abundant and to increase labor productivity where labor is limited when compared with capital availability. In those countries as the United Kingdom or the Netherlands where the level of technology has attained a certain level, investment in equipment is well done and where labor productivity has come to a limit, the only way to increase export (to increase output) is to increase the supply of labor forces.
In underdeveloped countries, both increase in capital supply and increase of productivity (of labor and capital) is needed in order to supply jobs to abundant labor forces and in order to increase export to emerge from monoculture.

The case of Japan is more complex. 1) They have to absorb new additional labor forces on the one hand and also have to raise productivity which saves laborers on the other. 2) Though labor forces are abundant they lack mobility (lack of skill, training, or residence) 3) Capital is not short, but maldistributed. Capital interest is higher than in advanced countries.

In this context, "dual specialization" in exports based on the duality mentioned above, has become an important principle of export policy in Japan.

Duality in import also exists though hindered by some factors (as dollar shortage, dollar maldistribution, tariff policy, etc). The proportion of import to national income in Japan is not so high as in the United Kingdom and Netherlands, but import propensity of raw materials and capital goods is the highest among them. Japan exports capital goods to underdeveloped countries on the one hand, and imports them from the advanced on the other. And usually rapid economic growth accompanies an increase of import. 4

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4. In the long-run, the increase of import paralleled (or sometimes lagged behind) with the increase of export (or output). But sometimes it preceeds export (because of the time-lag and the different propensities among various commodities), which causes radical policies in remedying imbalance of international payment.
This relationship between export-import and economic growth brings many troublesome problems as we will discuss later.

At any rate, this "duality" seen through every field—in production, employment, consumption, investment and in foreign trade—is a fundamental feature of Japanese economy. It has sometimes supported and sometimes disturbed the economic growth making it what it now is—a semi-advanced country.
If the research worker asks himself why he is interested in doing an industry study in the first place, or what an industry study can teach him which relates to some other part of his career, he should be able to arrive at a meaningful research purpose.

E.E. Hagen
Industry Selected

The way to make a future developing program the most effective is to base it on an accurate diagnosis of present conditions. The significance of present conditions will be most clear if they are compared with conditions in other countries at various stages of development.

There are many ways to make an international comparison theoretically, and studies of the methodology are now under way in many fields. I would like to know if the hypothesis that "Japan is a semi-advanced country" to which I have referred briefly in the former chapter, is true with respect to an individual industry, and, at the same time, to know how the semi-advanced status of the industry is connected with the semi-advanced condition of the economy as a whole.

According to my first plan, I intended to take up several industries of several countries at least, but, here, for the time being, I will analyze the iron and steel industries of three countries: of the U.S., Japan and India. I have selected these three countries as examples of an advanced country, a semi-advanced and an underdeveloped.

Before making the comparison, I would like to explain the reason that I have selected this industry (the steel industry) as the first case study.

The first reason is its historical features.

It is in the relatively modern times that the steel industry has made a continuous growth as a modern industry and has come to play an important role in the course of economic development of a given country, although it originated in very early times. The steel industry, in spite of its short history has become essential in the modern economy and it is
interesting to examine the mutual influences between the steel industry and the national economy as a whole. This may make a sharp contrast with other industries such as the textile. Moreover, the initial background of its development differs from country to country and these differences cause fundamental differences of today. Although there have been many works which have dealt with this industry in concise and in an over-all manner, very few of them investigate its historical features and deal with it as a problem of development.

Second, the development mechanism of the steel industry is different not only from the other industries of the same country but also from the steel industries of foreign countries, each of which reflects the fundamental features of a country. The industry can develop only when it makes good use of given conditions of the country, and, contrariwise, it can never develop as long as it cannot use them or fails to do so. Here, the abundance of data in this industry will be very useful in analyzing and comparing the processes and causes of economic development.

The steel industry is one of the most progressive and largest scale industries in the modern world. It would be a reasonable argument to say that it would be better to analyze and compare the most stagnant or the smallest industry to note the differences between advanced countries and underdeveloped. But, it can also be said that even in studying the most advanced industry, we can observe a degree of backwardness in the case of semi-advanced or underdeveloped countries.

Third, this case study will provide evidence pertaining to the international relations of national economies. The modern steel industry connects various countries, providing an international commodity to the
world market on the one hand, and using various materials of various areas on the other.

In this context, it is also hoped that some suggestions on the problem of international division of labor and the current world policies.

And finally, from an analytical point of view, data and statistics have been relatively well arranged in the case of the steel industry. This is because (1) steel has been developed as an international commodity (2) the quality of steel as a commodity can be classified easier than other commodities and (3) enterprises are larger and more rationalized (this means high coverage in statistics having high availability).

**Limitation of a Case Study**

Needless to say, this is only one of a number of case studies; which means an insufficiency for making a complete international comparison. The limitations of a case study of the steel industry are as follows:

First, the steel industry is, as I mentioned before, relatively younger than others such as the textile industry, so that it would be insufficient to analyze a wide range of the problems of economic development only by this case study, even though it may provide some fundamental factors of development, especially in the initial stage of development.

Second, although the industry reflects the features of the country to some extent (presenting those typical ones), it may also present an "exceptional" case. (The importance of the industry in the national economy having changed as time passed.) We cannot distinguish the "typical" and the "exceptional" by only one case study.
Third, about statistics. Even though the steel industry has well arranged statistics as mentioned above, still they are uncertain especially in the case of price comparison. (I have already mentioned general difficulties before.) Generally speaking, the statistics concerned with production are more accurate than those of income and interest which are often modified by management's point of view.

Professor Hagen points out the difficulties of industrial comparison in his book. He says, "the term an industry is an indefinite and elusive one. Even the most careful verbal descriptions of the industry, its product, and the types of labor it employs may not prevent ambiguity. Any research worker soon finds that the differences in industrial structure between different countries and in the meaning of words to different persons are such that any simple phrase used to define an industry, for example, the iron and steel industry--has significantly different meanings not only in different countries but also to different individuals in the same country..."

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CHAP. II. ANALYSIS OF HAGEN'S OFRID

OFRID (Outline of Factors Relating to Industry Development)

There are many methods to approach and analyze the problems of an industry, such as explaining current changes, describing it historically, or comparing international relations statically. In any case, we approach the problem from the viewpoint of capital, labor, market, technology, or management. Which method is the most effective depends on the object of the study, but in the case of international comparison, we have to touch upon all of these factors to some extent to get even a rough notion about the problem.

This procedure (of making an overall rough observation), though being the first step of the study, is basic and the most complicated in arranging the materials concerned.

Professor Hagen presents a methodology of industrial study applicable mainly in the case of underdeveloped countries, yet it seems to be most convenient to adopt his OFRID to get a general view of the iron and steel industries of three countries. OFRID is also helpful in establishing some theoretical models later. So, I begin with this OFRID.

OFRID, as Professor Hagen himself says, is so general that we have to change the research items case by case in analyzing a particular industry. I have tried to keep his original forms as far as possible. It may look rough to some extent on the one hand, but it will also deserve to get a general bird's-eye-view of the industries on the other hand, though it may possibly give an axiomatic impression by some kind of formalism.

OFRID consists of 16 items which I will explain item by item in the following analysis. The items are:
Identification (classification, products, process, present capacity, coverage of the study, etc.)

Origin of the Industry (when, where, by whom, and what for, brief description, general background, etc.)

Location (actual location, initial location, causes of change in location, etc.)

Size of firms composing the industry (size of capital and capacity, etc.)

Size of industry (capacity and production, etc.)

Income creation in the industry (distribution of aggregated revenues, relations among distributive shares, etc.)

Production method and costs (costs distribution, capital coefficient

Supply (sources of raw materials, historical development, etc.)

Markets and marketing channels and policies (market composition, market channels, price policies, etc.)

Labor and labor relations (number of workers, their background, labor relations, labor unions, etc.)

Research (general features, etc.)

Finance and Financial Organization (evolution, organization, etc.)

Internal administrative organization and practice (general description, etc.)

Interfirm relationships (types of competition, etc.)

Industry-government relations (general relations, regulations)

Economic and social significance of the industry (contribution to national income, international economic effects, social effects, etc.)

note: 1. parenthesis show main problems involved in each item. Originally, Hagen explains in detail.

2. in the following pages, U.S. is abbreviated as U.S., Japan as J, and India as I.

General Description

The steel industries of these three countries belong to the largest scale industries in each country, providing basic raw materials for other industries and using a wide range of raw materials and labor. Thus they have become the centers of industrialization in each country. However, in spite of this common important role in their economic fields, they
have developed in different ways, having been based on different conditions and histories.

The steel industry of the U.S., the largest among these three, has developed in a relatively short period. Although the first successful blast furnace and iron works began operation at Saugus, Massachusetts in 1641, the real development started around the middle of the nineteenth century. From the very early part of the twentieth century strong competition and many mergers developed, and the industry has grown greatly since that time.

In 1954, there were 255 firms engaged in making steel whose 430 plants have an annual total capacity of 113 million tons of ingot steel. There are 260 blast furnaces with a total capacity of 64 million tons of pig iron and ferroalloys a year. They basically use domestic materials supplemented by imported ones. A total of more than $9 billion is invested in the industry and nearly 650,000 workers engage in the production. The industry provides its products both to the consumers' market (the largest) and the capital goods' market and for export (the smallest).

The leading producer is the United States Steel Corporation, which accounts for almost one-third of the nation's output. Bethlehem comes next, and then the Republic Steel Co. All of the biggest group are completely integrated companies.

The steel industry of Japan had begun to develop around the middle of the nineteenth century, but it was operated by small producers, mainly for defense use. The real development began on the basis of social overhead capital and light industrialization nearly 30 years after the Meiji Restoration. Since then, the industry has made a rapid growth parallel to the rapid growth of national income in this country.
In 1954, there were about 421 companies in the industry having 9.5 million tons capacity of ingot production. The Yawata Co., producing 2 million tons of ingot, is the largest. Following this, five integrated companies have 70% of the nation's total output. These six large integrated companies have 70% of the nation's total output. These six large integrated companies, though having developed in different manners, constitute an oligopoly and thus dominate the whole industry.

The market consists of three parts, as in the case of the U.S.A.—consumers', capital goods', and export, of which capital goods has the largest proportion; but export also plays an important role, having about 20% of the total production.

The steel industry of India, the oldest but the smallest among the three, has long suffered a low level of production faced with small-scale demands. The production, which is about 1.5 million tons of steel ingot, is almost dominated by two integrated steel companies. The larger is Tata and the smaller is Indian Iron and Steel (formerly the Bengal Co.). The production is expected to develop rapidly hereafter as the industrialization goes on according to the Five-Year Plan. This additional production will be done much more by State's new plants which are aided by both Western and Soviet-bloc countries.

The next table shows the production levels of these three countries.

<table>
<thead>
<tr>
<th></th>
<th>U.S.A.</th>
<th>Japan</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>production in (ingot, 1000 tons)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1939</td>
<td>47,898</td>
<td>6,696</td>
<td>1,067</td>
</tr>
<tr>
<td>1957</td>
<td>102,253</td>
<td>12,570</td>
<td>1,710</td>
</tr>
<tr>
<td>1960 (forecast)</td>
<td>138,000</td>
<td>20,150</td>
<td>6,000</td>
</tr>
</tbody>
</table>
| steel consumption per capita (1952-1954 average, kg.) | 540 | 69 | 5.1
Source: Figures for production are from the UN annual statistics. Production forecasts are from OEEC, European Steel Trends (1950) for U.S. and from New Long-Range Economic Plan for Japan and from the Second Five-Year Plan for India. Figures of consumption per capita were calculated from these data mentioned above.

1. Identification

Here, I use the international standards to classify the industry as far as possible. Physical unit of steel in which steel output is stated is metric tons.

There are few statistical problems in the case of the industry as a whole. But, in the case of individual companies, they are rather troublesome; for instance, let us take the balance sheet of a company which covers usually all items of production. Some include the figures of raw materials which they produce in the same enterprise in addition to pig iron, steel ingots, and ordinary finished steel (many of them produce raw materials in the U.S., but few do in Japan since World War II), some do transportation work by themselves (many of the Lake-side steel companies in the U.S., or iron ore boat in Japan) and some produce special steel besides ordinary finished steel or other by-products such as town-gas, coke, cement and chemical products, some of which are sold outside and some are consumed in the home factories. Also, in the case of the U.S. and Japan, investment for mine and transportation facilities abroad is included in the balance sheet.

Especially, we have to be very careful in arranging and aggregating the figures when (1) we use an input-output analysis or (2) we study the industry historically (it is a history of merger and consolidation).

2. Origin of Industry

The origin of the steel industry in the U.S. is relatively clear.¹

¹. The first successful blast furnace and iron works began operation at Saugus, Mass. in 1641, V. Stanley, American Industry (1957), p. 52.
The process of making steel and classification of company by process it covers are as follows:

\[
\begin{align*}
\text{(raw materials)} & \quad \text{(iron)} & \quad \text{(steel)} & \quad \text{(rolling -- fabrication)} \\
\text{coal-cokes} & \quad + & \quad \text{iron ore} & \quad + & \quad \text{lime and others} & \quad \text{\rightarrow} & \quad \text{pig iron} & \quad + & \quad \text{scrap} & \quad \text{\rightarrow} & \quad \text{steel ingot} \\
& & & & & & & & & & \quad \text{ordinary} & \quad \text{alloy} \\
& & & & & & & & & & \quad \text{finished} & \quad \text{special steel} \\
\text{(transportation)} & \quad \text{(by-products)} & \quad \text{gas, cement, chemical products} & \quad \text{Other process} & \quad \text{(machine, etc.)}
\end{align*}
\]

Degree of integration of companies

(Classification of Company

\[\begin{align*}
\text{integrated company (U.S.)} & \quad \text{integrated company (J), (I)} \\
\text{semi-integrated company (U.S.) (J)} & \quad \text{non-integrated co. (U.S.) (J)}
\end{align*}\]

having a young history and having been developed as a capitalistic organization from the beginning. But we cannot tell any particular time of their origins in the cases of India and Japan; both of them have records that they used iron more than 2000 years ago, though we cannot regard them as industries in the common sense. We have to begin with the start of capitalism. But, here again, we meet another question; when did capitalism start in these two countries?

In Japan, there had existed many small iron-making factories operated by hans for the purpose of defense use before the Meiji Restoration. The fact that the industry had been fostered by rulers (daimyo) to defend their land in the Tokugawa era as well as the fact that the Meiji government
protected the industry from the viewpoint of "Fukoku-kyohei" (Enriching the Empire and strengthening the military force), determined the nature of the industry of Japan.

Information is abundant, as we will see later, concerning the history of the industry; the ways of management, labor relations, etc. At the same time, we have to notice the fact that the Government (and han before the Meiji Restoration) had learned much from foreign countries (France, England, Germany, and the U.S. after the war) which has also influenced the development pattern of the industry.

Usually the establishment of the Kamaishi Factory (early Meiji) is regarded as the first step, but a continuous growth began when the Yawata Iron Plant started as a governmental enterprise in 1901. So, the steel industry of Japan has about sixty years' history. 2

In the case of India, though there existed a record that an attempt was made to start an iron factory on a commercial basis in 1779, the first production of pig iron was made by the Bengal Iron Co. in 1919. It was common both to India and Japan that the attempt had to be repeated before the first success on a commercial basis. And the causes of failure common to India and Japan: shortage in capital, lack of knowledge, narrowness of market, etc. are ones which are not seen in the history of the American steel industry, where everything seemed to start more smoothly than the others. 3

2. Japan Iron and Steel Association celebrated its hundredth anniversary in 1957. T. Ohsima built a blast furnace for the first time at Nanbu-han in 1857.

3. The U.S. Steel Corp. (the biggest in the U.S.) was established in 1901. Before that time (1850-1898), many small firms competed. In India, Tata Co. (the largest) was established in 1907. But it was not until 1933 that production of steel exceeded 500,000 tons.
3. Location of Firms and Industry

In the case of India, firms are initially located according to the source of raw materials. In addition to closeness to raw materials, they have also transportation facilities and have a market to some extent in the hinterland. The raw materials (coal and ore) are produced in the interior of India and the import of materials is small, so that the condition of harbors has less importance in India than in other countries (like Japan). Later when the new governmental plants were planned in its Five-Year Plan, not only the source of materials but market structure and technical pattern of production were considered in choosing the location.

In the case of Japan, location was determined both by domestic and import materials at first; Kamaishi for iron ore, Yawata and Wanishi for domestic coal, and Yawata also is considered convenient for importing coal from China. In contrast to these integrated companies mentioned above (before the war, they all belonged to Yawata Seitetsu Co. owned by private and government half and half), semi-integrated companies are located at places where it is convenient to import steel scrap from the U.S., as Kobe (Kobe-I.S. Co., Kawasaki Co.) and Osaka (Sumitomo). Another private integrated company (formerly semi-integrated), Nihon-Kokan is also located near a harbor (Yokohama). These places have, at the same time, markets in the hinterland.

But later as the propensity to import has risen, particularly from the U.S., the condition of harbors becomes a more and more important factor in determining the location of the industry (e.g., Chiba Plant of Kawasaki Co.). In addition, the problem of water supply has also become an important factor recently in Japan.
In the U.S. it has been considered favorable from the beginning of the industry's history to locate near Pittsburgh-Youngstown and the Great Lakes where materials (coal, ore, and scrap), transportation facilities, and markets have been available. Thus a great steel production area was formed there. Then gradually, together with the shift of material resources both domestic and imported, the industry has shifted to the South and then, with other industries, to the West. Therefore, location in the U.S. is determined not only by material conditions but also by the market.

There are two tendencies recently: one is that the location pull of raw materials (especially coal) has weakened with technical changes (sintering operation, use of oxygen, increase of fuel efficiency). The importance of the market has increased. The other is that the businessmen prefer to enlarge the old plant or build a new one nearby rather than to construct a new plant in a new area, because construction cost is higher than enlargement cost. For instance,

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost per ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. new plant</td>
<td>$300-330 (cost of constructing an integrated plant with a capacity of 2.5 million tons.)</td>
</tr>
<tr>
<td>enlargement</td>
<td>$180 (in the case of constructing in an existing area)</td>
</tr>
<tr>
<td>replacement</td>
<td>$16 (only by improving open-hearth)</td>
</tr>
<tr>
<td>J. new plant</td>
<td>$158 (cost of constructing new integrated plant of a capacity of 1 million tons)</td>
</tr>
<tr>
<td>enlargement</td>
<td>$100 (constructing in existing area)</td>
</tr>
<tr>
<td>I. new plant</td>
<td>1317 rupees (new plant by Five-Year Plan)</td>
</tr>
<tr>
<td>enlargement</td>
<td>320 rupees (in case of Tata)</td>
</tr>
<tr>
<td></td>
<td>816 rupees (in case of IISC)</td>
</tr>
</tbody>
</table>

4. Rigidly speaking, the first place where the industry developed was the Eastern region—Massachusetts, Pennsylvania, and New Jersey.

5. Within this area, shift from coal area to sources of scrap can be seen (by technical change).
4. Size of Firms and of the Industry

The size of the steel industry is huge compared with other industries. Whatever measure we may adopt, say output in tons or pounds, or the number of employees, or the value of capital, this industry belongs to the largest group among industries. The reasons are:

1. Physically, the product is large and heavy
2. It is a material-processing industry, thus the production and transportation facilities are required to be large-scale
3. The demand for the product becomes larger as the industrialization of the national economy goes on
4. This fact makes mass production advantages
5. Hence, the investment scale becomes large having a relatively high organic composition of capital
6. The number of workers, in spite of low proportion to total capital, becomes large in total.

In all of these countries, the steel industry is on an overwhelmingly large scale compared with other industries, even though there are differences among these three countries. The production level of the U.S. is ten times larger than that of Japan, and sixty times that of India. The capacity of companies also varies among these countries: U.S. Steel, the largest in the U.S. (35 million tons in ingot production in 1954) is 32 times the size of Tata, the largest in India, and 15 times that of Yawata Co., the largest in Japan (capacity of 2.2 million tons in 1954).

However, the differences in size in these three countries are not so important as the differences in kind which are determined not only by the size of the market but also by the nature of the industries in each country.

So far, I have talked in the present tense. From an historical point of view, we can observe, contrary to what might be expected, the
fact that the U.S. made the most rapid growth in steel production among these three. In the past twenty years, the production of steel increased 270% in the U.S., 180% in Japan and 170% in India. This difference is the result of various factors operating during the development, as we will see in the following lines.

Attention should be paid to the differences in the distribution of companies by size.

The differences in total capacity does not mean a comparable difference in the number of firms. For instance, there are more firms per quantity of production in Japan when compared with the U.S. In other words, capacity per plant in Japan is smaller than in the U.S. 6

<table>
<thead>
<tr>
<th></th>
<th>Number of firms</th>
<th>Number of plants</th>
<th>firms with capacity of over 20,000 tons</th>
<th>their total capacity (1000 tons)</th>
<th>average capacity in tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.</td>
<td>421</td>
<td>536</td>
<td>42</td>
<td>9,481</td>
<td>226</td>
</tr>
<tr>
<td>U.S.</td>
<td>255</td>
<td>430</td>
<td>74</td>
<td>112,655</td>
<td>1523</td>
</tr>
</tbody>
</table>

By the way, there are 19 plants (more than 10% of the total plants) which have capacity of more than two million tons in ingot production per annum in the U.S. The Yawata is the only one who produces more than two million tons in Japan (2.2 million tons), and Tata of India has a capacity of 1.1 million tons. 7

In the case of India, though the statistics are not accurate, the production is concentrated in the Tata and the Indian Iron & Steel Co. (IISC).


7. Yawata of Japan is approximately equal to Colorado Fuel & Iron Corp. (the 9th of the U.S.) or Wheeling Steel Corp. (the 10th) in capacity.
This means that in the U.S. rapid growth has been sustained by rapid growth of market. And there have been stronger movements toward consolidation than in Japan, where many small-scale firms exist as the "safety devices" of large firms, and, in India, the industry has not yet entered into a continuous growth, so that the market remains small. 8

6. Income Creation in the Industry

General features of income creation is shown in the component of total cost, though there are many difficulties in comparing the figures, which differ in their accuracy.

The ratio of value added to total production in Japan is only 30% because of the high proportion of raw materials and services. The ratio is almost twice as large both in the U.S. (55.6) and India (57.5).

<table>
<thead>
<tr>
<th></th>
<th>Value Added</th>
<th>Labor Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material</td>
<td>Value Added</td>
<td>(Labor Cost)</td>
<td></td>
</tr>
<tr>
<td>U.S. (1954-56)</td>
<td>41.4</td>
<td>34.0</td>
<td>100.0</td>
</tr>
<tr>
<td>J. (1935)</td>
<td>69.0</td>
<td>31.0</td>
<td>100.0</td>
</tr>
<tr>
<td>(1954)</td>
<td>70.5</td>
<td>29.5</td>
<td>100.0</td>
</tr>
<tr>
<td>I. (1950)</td>
<td>72.5</td>
<td>27.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Roughly speaking, Japanese industry covers its disadvantages in raw materials by relatively low level of labor cost.

The distribution of value added is calculated as follows (percentage to total sales):

<table>
<thead>
<tr>
<th></th>
<th>Depreciation</th>
<th>Interest</th>
<th>Tax</th>
<th>Net Profit</th>
<th>Gross Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. 1953</td>
<td>5.7</td>
<td>0.5</td>
<td>6.1</td>
<td>11.0</td>
<td>23.3</td>
</tr>
<tr>
<td>1954</td>
<td>6.3</td>
<td>0.5</td>
<td>6.1</td>
<td>11.1</td>
<td>23.3</td>
</tr>
<tr>
<td>1955</td>
<td>6.1</td>
<td>0.4</td>
<td>10.9</td>
<td>9.7</td>
<td>27.1</td>
</tr>
<tr>
<td>1956</td>
<td>5.7</td>
<td>0.4</td>
<td>9.7</td>
<td>8.5</td>
<td>24.3</td>
</tr>
<tr>
<td>J. 1935</td>
<td>2.5</td>
<td>0.9</td>
<td>0.6</td>
<td>13.3</td>
<td>17.3</td>
</tr>
<tr>
<td>1953</td>
<td>2.6</td>
<td>1.1</td>
<td>1.8</td>
<td>5.8x</td>
<td>9.5</td>
</tr>
<tr>
<td>1954</td>
<td>3.5</td>
<td>1.0</td>
<td>0.7</td>
<td>2.1</td>
<td>9.5</td>
</tr>
<tr>
<td>1955</td>
<td>4.8</td>
<td>0.7</td>
<td>1.2</td>
<td>3.4</td>
<td>13.1</td>
</tr>
<tr>
<td>1956</td>
<td>4.7</td>
<td>3.0</td>
<td>3.3</td>
<td>4.5</td>
<td>16.2</td>
</tr>
</tbody>
</table>

Source: Number of samples are 8 (1935), 33 (1953), 40-41 (1954-56) in Japan and about 52 in the U.S. From T. Shimamura, "Economics of the Steel Industry," 1958, Tokyo. Original data same as the former table.

8. In the U.S. rapid growth was also stimulated by mass production in a single plant by a single product (having sufficient market).
The profit rate (the rate of the sum of depreciation, interest, tax, and net profit to total capital used) in the U.S. is usually higher than in Japan. Though in both countries the rate of profit fluctuates yearly, it is a little more stable in the U.S. than in Japan.

The ratio of depreciation of Japan is, though rising gradually recently, still lower than that of the U.S. In the prewar period the depreciation and tax rates were kept low by government aid. The ratio of interest (about 0.5 in the U.S. and more than 3.5 in Japan, except in 1935) is higher in Japan because of high reliance on outside finance. This suggests a future course as follows: the control of materials both in production and transportation by the steel manufacturer seems to be necessary to lower the high cost of raw materials, but there is a limitation in doing so in Japan because of the naturally poor condition of raw materials compared with the U.S. and India. So, in order to raise the rate of value added and undistributed profit, there is no way except to increase sales and to keep prices stable, and more than that, to raise productivity more rapidly than wages. To lessen the labor cost directly is not desirable either politically or theoretically (and not domestically or internationally).

Consequently, from a national economy point of view, the only way to change the disadvantages in capital structure into some advantages in the world market is not to sell crude products but to add more fabricated processes. We have to make the most of our factor endowment in a national economy as a whole. As far as we try to solve the problem in an individual sector, we may not be able to get rid of both high rate of interest and pressure of labor.

7. Production Methods and Costs

Production methods are physically common to these three countries:
namely, iron ore and coke = pig iron + scrap = steel ingot = (rolled and fabricated) finished steel. And from this process, four types of makers come out: namely, as shown on page 62, integrated company, semi-integrated company (with open-hearth) non-integrated company, and electric furnace company. The integrated company is the most modern among them.

In India, Tata (the largest) and the Indian Iron and Steel Co. (the second in size, whose capacity is about one-third of Tata) are both integrated companies. The proportion of these two companies to total production is very high because the other manufacturers are small. The fact that the production of pig iron exceeds that of steel ingots in India shows that (1) this country has natural advantages in pig iron production having rich ore and coal (2) the scrap market is young because of the small market of steel (3) and because the use of iron relative to steel is still high (low level of machine production).

The production method in Japan has long been characterized by the coexistence of the integrated companies and the semi-integrated ones. This has been due to the easy importation of American scrap and relatively low labor cost in semi-integrated companies. But, the situation has gradually changed in the postwar period. These companies are losing their advantages now, because of decrease in American scrap supply and increase in the demand.

The main semi-integrated companies have changed to integrated companies by constructing blast furnaces themselves (Kawasaki Co.) or by merging with small pig iron makers (Sumitomo Co.).

But unlike in the U.S., even this change of the production method (from semi-integrated to integrated) cannot eliminate the disadvantages

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9. Indian Iron & Steel Co. is a merger of IISC (same name), iron producer, and the Steel Co. of Bengal.
of steel production in this country. The elimination can be done only by additional processing. And this suggests continuing the existence of the major groups of production, the "Keiretsu" system.

The process of ingot production is similar in these three countries; the open hearth occupies the majority. But the kinds of fuel are different; coal in India; coal, oil and electric power in Japan; oil and gas in the U.S. This depends on the natural condition of raw materials. Electric furnaces in Japan may appear curious in view of the high cost of fuel in this country. In fact, these are small-scale industries which use seasonally cheap power generated by torrents in the mountain areas and which are so-called "marginal producers."

The conditions of raw materials are different in these three countries, so are the components of costs.

The raw material costs both in the U.S. and Japan have risen to a relatively high level compared with other commodities. Especially in Japan, it is true because: (1) production costs of pig iron have risen because of the higher prices of iron ore and coal; (2) demand for pig iron, hence for coal and ore, increased relatively according to the decrease in the scrap supply; (3) the production of pig iron is monopolized by large producers; (4) technological progress is made more in the fabrication fields than iron and ingot making process; and (5) in pre-war times, raw materials were sometimes gotten by non-economic forces such as colonialism.

Another important point concerned with production methods is the problem of capital investment and its efficiency. It is a troublesome problem because of many existing difficulties like estimation of actual investment, exchange rate, the definition of depreciation, etc. And in
addition to these difficulties, the history of the industry (merger and acquisitions) makes the calculation complex.

The purpose of the use of the capital coefficient is to judge roughly the efficiency of the capital of some groups of industry or the national economy as a whole to some extent and in the long range. And from a theoretical point of view, it is questionable whether to use this concept in analyzing an individual industry.

Generally speaking, this concept shows (1) the efficiency of a capital in different times or of capital of the same kind in different places and (2) the differences of "Organische Zussamensetzung" between different kinds of capital. And therefore the capital coefficient changes for many reasons. Though we cannot compare the figures on the same basis we may roughly say as follows; the capital coefficient increases (+) or decreases (-) with the following changes:

- Rapid growth
- Increase in growth rate
- Shift to high "Organische Zussamensetzung"
- Over capacity
- Technical progress
- Operation degree (high)
- Changes in relative price
- Change in inventory (increase)

Of course it differs according to the kind of capital. Some studies have attempted to calculate capital coefficients individually in these countries. But they are not uniform enough to be compared on the same basis here.

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10. It is hard to calculate because we need long-run observation. Short-run observation (or static) is easier but dangerous.

Another method of comparison of production efficiency is to use some physical consumption per unit (e.g., coal consumption per ton of iron). This method is usually used to observe technical changes historically in the same country but not to compare different countries, because both quality and the price of input materials are different in each country.

For example, ore and coke consumption per unit in Japan is lower than that of the U.S. That the size of a blast furnace in Japan is smaller than that of one in the U.S. has one reason. (Generally, the larger the capacity is, the higher the efficiency, but, for the Japanese steel industry it is not always true, because they have to collect the same kind of ore from various places to fit a single unit.) But the fact that Japanese industry uses higher quality of ore than the U.S. is a main reason.

Fuel consumption per unit in Japanese open hearths is also lower than in the U.S. In this case we have to take into account the price level of the fuel used.

<table>
<thead>
<tr>
<th>Material consumption per ton of pig iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>ore (ton)</td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>J.</td>
</tr>
</tbody>
</table>

If the low price per unit of material can cover the disadvantages of high consumption per unit, then the advantages of low consumption will disappear no matter how low it is. We can be proud of technical progress only when low consumption of material per unit is gained on the same price level with the same quality of materials.

8. Supply

Supply suggested in Hagen's OFRID is mainly the input of materials to which I have referred so far. We can summarize it as follows:
1. Different conditions of raw materials. The poorest in Japan; abundant but not utilized in India. The U.S. is the richest, though the propensity to import is increasing recently as domestic resources are exhausted and as many other industries shift to the South and West.

<table>
<thead>
<tr>
<th>Material</th>
<th>U.S.</th>
<th>J.</th>
<th>I.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ore</td>
<td>3,000 (Fe 65%)</td>
<td>62</td>
<td>9,347</td>
<td>53,918</td>
</tr>
<tr>
<td>Coal</td>
<td>2,028,000</td>
<td>16,218</td>
<td>62,113</td>
<td>6,528,730</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Import of ore (1957)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of total consumption</td>
</tr>
<tr>
<td>U.S.</td>
<td>25%</td>
</tr>
<tr>
<td>J.</td>
<td>73%</td>
</tr>
</tbody>
</table>

2. In the long run, costs of raw materials continue to go up, especially in Japan. And raw material costs to total production costs are the largest in Japan because of high material costs and low labor costs.

<table>
<thead>
<tr>
<th>Country</th>
<th>Current price of raw materials (early 1958)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coal</td>
</tr>
<tr>
<td></td>
<td>import</td>
</tr>
<tr>
<td>U.S.</td>
<td>7.76-8.54</td>
</tr>
<tr>
<td>J.</td>
<td>24.44</td>
</tr>
</tbody>
</table>

3. Channels in getting raw materials are different in each case. In the U.S., many steel manufacturers have their own mines and transportation facilities. Japan had the same system before the war, but not now. In India, iron ore is managed by the STC, a government organization.

4. The U.S. and Japan now invest abroad to secure new sources of materials. Generally speaking, every government cooperates with private
firms in securing raw materials.

9. Markets and Market Channels and Policies

The order of the amount of sales is the same as the order of the amount of production: the U.S. first and India last.

The problems are market structure, channels of distribution, and price policies. International comparison becomes more vivid at this point than with respect to other factors mentioned so far, where the differences are largely due to natural conditions.

At first, let us observe steel consumption by demand sector. (Classification of industries is not exactly the same. But it is not necessary to get a general comparison.)

In the U.S. the domestic market is overwhelming, with few exports. In the domestic market, automobiles occupy almost 22% of the total market. The next is household goods and containers which hold about 10%. In other words, steel consumption is directly connected with consumption (in an economic sense). Private house construction occupies 10% of the total market. Here the affluent society of America sustains the steel industry. The steel industry will maintain stability as long as consumption in the American economy keeps stability. This obviously shows the pattern of an advanced country.

On the contrary, the Japanese steel market depends on both exports (15% of total sold) and the domestic market (85% of total). The majority of the domestic market is occupied by capital goods sectors such as railways construction and machinery. The proportion of automobiles, electric appliances, containers and other durable consumer goods is much smaller than in the U.S., though it has been increasing rapidly in recent times. This corresponds to the specific structure of this country: high investment and low consumption. This pattern of market structure lacks stability,
having too much weight on a "marginal" export market and lacking consumption in the domestic market.

Component of market (1955) (%)

<table>
<thead>
<tr>
<th></th>
<th>for export</th>
<th>domestic market</th>
<th>consumption</th>
<th>dealers</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>4.2</td>
<td>31.0</td>
<td>48.8</td>
<td>16.0</td>
</tr>
<tr>
<td>J.</td>
<td>14.5</td>
<td>30.0</td>
<td>40.9</td>
<td>14.6</td>
</tr>
</tbody>
</table>

In the case of India, the market is narrower than in the other two, having little consumption connected with personal expenditure. The market of capital goods is also underdeveloped and concentrated in agriculture, public construction, railway and defense sectors, lacking proper markets in manufactures, especially in the machine industry. This is one of the main features in an underdeveloped country.

This market structure is connected with the structure of various types of products. In the U.S. sheet and pipe (particularly thin plate) have a high proportion, and bar, frame, and wire rod have a low proportion. In Japan, the majority is occupied by semi-finished steel, rails, frame, bar and thick plate. In India, semi-finished has a high proportion and many kinds cover the remainder but in a small amount each.

As for channels of distribution, intermediaries deal with about 15-20% of the total distribution both in the U.S. and Japan. This percentage is a little higher in the U.S. than in Japan; of the additional sales to dealers in the U.S., one-third is distributed to oil areas and the remainder to residences and households through dealers. On the contrary, in India

12. Transportation changes its pattern according to economic development. In underdeveloped countries, railroads come first, and in advanced countries automobiles are the leading facility. In the U.S. the consumption of steel in the railway sector was 10% of the total consumption 30 years ago. It has declined to only 3-4% now. On the contrary, steel consumption in the automobile sector is about 20% now, which was only a low percentage 30 years ago.

In India in 1954, railways alone were allocated one-third of finished steel production, and government's offtake may be estimated at 40% of the larger annual supply.
steel is distributed by a State Cooperative in order to secure the necessary amount for basic sectors that is essential for development plans. This is a type seen in the early stage of economic development.

In spite of a high consumption rate in consumers goods, direct sales occupy 75-80% of the total distribution and only 15-20% is sold through dealers in the U.S. This is due to the fact that the production of these durable consumer goods (electric appliances, automobiles, etc.) is concentrated in a few large manufacturers in the U.S. The majority of the large steel companies, like U.S. Steel, sell their products directly to their customers. The exception is Colorado Fuel & Iron Co. in the West, who for regional reasons does not do so.

In Japan, the proportion of direct sales is also high, as in the which U.S. But this is because the production of capital goods makes the main market for steel, is concentrated in a few large manufacturers. So, if the consumption of steel shifts to consumer goods from capital goods in the future, the weight of direct sales will decrease in Japan.

The similarity of this proportion between the U.S. and Japan, however, is only formal. The nature of dealers is different in these two countries. In the case of the U.S., they are highly developed capitalistic enterprises having some modern process machines and seem to be productive intermediaries, while in Japan, they are mercantile, getting only differences between buy-and-sell. They often have only an abacus, a desk and a telephone, but no processing machines, no transportation facilities, and sometimes even no storage facilities. The competition among these dealers is extremely hard. A number of them, connected with Zaibatsu or local Zaibatsu or independent, live and die as a cushion for makers in the fluctuation of business cycles. These
old merchant dealers, unlike modern industry, illustrate a remarkable feature of the Japanese steel industry—its semi-advancedness.

In the U.S. half of the dealers are also connected with a large producer. Still they are independent and are not subordinated to producer. The distinct sales field between direct sale and dealers is made clear.

In India, as we mentioned before, the government controls the distribution of steel products.

10. Labor and labor relations

Steel industries in these three countries are more capital-intensive than other industries of the same country. The ratio of labor to capital or output is relatively low compared with others. Labor is hard and skill is required, so that the wage is high. The majority of laborers are male and permanent workers. Labor consciousness is strong and the rate of organizing unions is one of the highest among the industries. These are common. But they have their own special characteristics.

The reason that the Japanese steel industry can compete with others in spite of low value added and high raw materials in the cost component, is that wages are low in Japan. The proportion of labor cost to total cost is smaller than in the U.S. even though in Japan they use relatively more laborers than in the U.S. This relatively low level of wages has sustained the Japanese industries as one of the leading factors (if not the only one), saying nothing of its moral value. I am not insisting on keeping this low level of wages, but just showing the fact as a fundamental feature of a semi-advanced country. The physical productivity of Japan is one-third that of the U.S., which is a composite of many factors, and is meaningless by itself. The way of combination with
capital (equipment and technology) is relative and is determined by many factors.

<table>
<thead>
<tr>
<th></th>
<th>wage</th>
<th>productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>2.70</td>
<td>205.3 tons</td>
</tr>
<tr>
<td>J.</td>
<td>0.38</td>
<td>68.4 tons</td>
</tr>
</tbody>
</table>

The source of labor in the U.S. is usually from fresh graduates, negroes or immigrants who adopt the modern manner, and transfer of labor from other industries. Workers can change their jobs freely according to their preference regardless of their social background.

In Japan the workers came from second and third sons of farmers before and during the war. But recently they came from fresh graduates and from other industries in urban areas. This change is because a high technical level is required and a training system attached to the firms has developed recently, and not because the supply of labor from agriculture has decreased. (It is true that modernization of agriculture has reduced the number of laborers required, but increase in the productivity of secondary industry preceded it.) The reason is not in the supply side but in the demand side. In this respect, the problem of employment is not that of disguised unemployment but that of skill, training or education as a whole. (Of course, this must be made clear by further case studies.)

As innovations have occurred the openings for those who were trained in the traditional skills have become fewer and instead there has been a growing tendency for firms to train their own technicians in special training schools attached to the factories. They have lost their jobs and transferred to smaller enterprises (usually to subordinated firms) or, if they remain
in the same firms, they are transferred to "miscellaneous workers". In addition to this, there are a lot of casual and temporary workers in the case of Japan. This is of course because of the low level of wages and the over-supply of labor.

It is not easy to compare the intensity of work in different countries. It is quite possible to compare hours of work, and we know that these have decreased steadily in the U.S., but not in postwar Japan. But this tells us nothing about the intensity with which work is done in the two countries. One way of making a comparison may be to compare the rates of industrial injury and the fact that this rate is much higher in Japan may indicate that the Japanese work with greater intensity.

The wage system of Japan is different from that of the U.S.; the former's is "reward" and the latter's "contractual". But as far as the wage system of regular workers in a large factory is concerned, it is gradually Americanizing. A peculiar wage system such as Abegglen has suggested is now disappearing rapidly from the large-scale industries but still remains in small steel enterprises; here again, we find divergence between large and small-scale industries.

The level of wages, the wage systems, and the balance of demand-supply of labor forces have also close relations to productivity. For example, in the case of the U.S. there is a tendency that labor productivity declines as the employment situation comes closer to full employment.

13. This reward type of salary is based ideologically on physical and social need rather than on ability. There is a similar request in India. "Wages will be set not on the 'market value' of labor but on the basis of the workers' physical and social needs as human beings." Rosen, "The Industrial Change in India," p. 147.


15. Security systems and insurance systems are still very different in these countries.

(note that the U.S. is the nearest to full employment among these countries), there being less competition.

On the contrary, in Japan where competition among laborers is severe, improvement of productivity is often requested beyond their abilities. In the case of Indian steel industry, it is rather peculiar: the productivity is disturbed by a wage system which is made more favorable than others by the power of the labor unions. 17

Labor movements are active and the rate of organizing unions is the highest among various industries in these three countries, yet their ideology, world view, concepts of "productivity" are quite different from each other.

Thus the problem of employment and labor must be analyzed from the national economic point of view.

11. Research: Exploration of Changes in Products or Methods

There are three types of research work (1) technical research for improving production methods in adoption of new machines and technology (2) economic research for marketing new sales possibilities and finding new channels and policies (3) managerial research concerned with improving administration and management.

These three types of research have been encouraged in all of the three countries. That in the U.S. is most effective and the most large-scale. It is difficult to measure how much capital has been invested in this field. In estimating the cost for technical research, investment before adopting mass production can be regarded as cost for research, or even the distinction between commercial and research (test) is not always clear, and in the case of market research, costs may be regarded as advertisement to some extent. 18

17. Rosen, Industrial Change in India, p. 151.

18. It is said that 1% of total sold is spent on research work in the U.S. and 0.5% in Japan. But this is not clear.
In the U.S. the military forces have a strong interest in technical research. The firms themselves have strong interests in this field and they cooperate with each other or with private institutes directly and indirectly (by donating funds or facilities), whereas in Japan, the government spends little on technical research and almost nothing on economic or management research. The research is done individually within a firm or small circle (in the case of Zaibatsu). Coordination between firm and university or institute, or other firms is very scarce and unsystematic. If they need, they ask for coordination or help from foreign firms. This is, of course, due to the fact that the steel industry has not yet developed fully. This may be said as follows: the entrepreneurs pay little attention to basic research and they prefer to rely on the results which have already been tested in a foreign country rather than invest in their own research which is still risky and far from commercial standards, and this seems to them to be the safest way to compete with others.

In India, the interest in research is high and urgent because of the present low level of technology and education. They still depend on foreign countries (on the U.K., before the war, and on the U.S. after the war). Both the government and private firms work hard in technical research, led by the Council of Scientific and Industrial Research which has seven public institutes working on a cooperative basis actively. They receive help from universities, both domestic and abroad, and from the Point Four Program also. Particularly, in India, training facilities for technicians in the foreman class, which are scarce at present, are most urgently needed.

12. Finance, Financial Organization and Practice

The steel industry in India, like the steel industry in early Japan, depends on the external capital and the government and also on foreign aid both in capital formation and in technological fields, being weak as a modern industry. In early times, the rich class managed the industry with the aid of foreigners (Management Agency System), but it is gradually being controlled by their own government, receiving aid both from the Western and Soviet bloc. The fact that outside reliance is high shows not only the weakness of monetary system but also underdeveloped condition of the economy as a whole.

Since 1949, the steel industry of Japan has stood on its own feet without direct protection of the government, which was a fundamental feature of the industry until that time. The growth was stimulated by the Korean War and the boom in 1955-57. However, the industry is not exempt from the shortage of self-finance and burdens of short-run debts. Thus it is an indirectly subsidized industry.

The proportion of borrowed (short-term) money to total capital expenditure is less than 5% in the U.S. and more than 10% in Japan.

Sources of debt are stocks and shares and private financial institutions in the U.S., and government and special institutions in prewar Japan. These special institutions lent money at cheaper interest than private banks. Immediately after the war they borrowed from government, special public banks and foreign aid, but gradually the weight shifted to stock markets. This is a general type but individually they have different structures. Anyway, there has been a strong reliance on governmental or other public institutions.
Having these financial channels, personal connections with money lenders are different among these countries. In the U.S., the connection is personal. But in Japan there have been many managers who came from government fields. Particularly in the Yawata and Fuji Co, which were once governmental enterprises, more than half of the managers are from the government. In the so-called Zaibatsu companies, like the Sumitomo Steel Co., although the number of managers who had a connection with the government is less than in the Yawata or Fuji companies, some of them have been sent from the Zaibatsu bank to consolidate Zaibatsu as a whole.

The cases in which the managers of the steel industry take governmental positions are often seen both in the U.S. and Japan.

13. Internal Administrative Organization and Practice

The main character of management and the way of thinking by managers is individualistic (personal) in the U.S., whereas in India and Japan, they are rather bureaucratic historically.

The case of the U.S. is purely capitalistic and its personality has recently been influenced by oligopoly (but still in a capitalistic way). In Japan, the growth of the steel industry from the beginning of its history was often stimulated by non-economic forces. It was supported by the government or by militaristic necessity. This feature still remains/fundamental one, even after the steel companies became private enterprises. Bureaucracy and formalism in management can often be seen, though they are gradually disappearing through the introduction of American-style management. Organization is gradually following a line system, but a personal order system still remains, especially in small enterprises. In human relations, strong connections with government (Fuji and Yawata) or with Zaibatsu (Sumitomo and others) prevail. Human relations in a firm follow the same pattern.
This tendency, that human relations are based on pre-modern ways, accordingly brings strong responsibility (favorable side) and sometimes troublesome sectionalism, such as a family-clan or a school-clan (unfavorable side) into public matters. Friction between individuals is not always personal but usually is connected with friction between clans. One's position is not always determined by one's ability but determined often by non-economic factors. In this respect, technicians take relatively lower positions and their promotions are usually behind those of the non-technical management staff. Few of them have chances to become part of the executive staff (though this trend is diminishing lately). The same things can be seen in the case of non-public school graduates.

In the transition from such old-fashioned management to modern, confusions sometimes occur; formalism on line-system, sectionalism in work division, friction between traditionalism and revolutionaryism, etc. In order to eliminate these confusions, many controller or guard systems are adopted by many firms today, but sometimes corruption or something non-economic/unfair happens because of uncorrected sectionalism. The competition to get these controlling positions is severe.

Recently, as a result of technical advances, standardization of work, and mechanization of office work are gradually developing, and consequently management is improving. Still, they bring harder work or are inefficient because of their crudeness.

In India, the divergence between staff and laborers is quite large in every field. This disturbs development of the industry. From this point of view, the main management policy is to diminish this gap.

Anyway, management in advanced countries is more efficient; it has less personal relations and it puts more importance on technology (technician) than the underdeveloped countries.
It is the same in the case of promotion and recruiting in the U.S. They are based on one's ability without considering personal relationships such as family relations, race, social class or school.20

But in Japan they are, as Abegglen described vividly,21 strongly based on the family system and other social orders. They put more importance on working time than efficiency (ability) and more on "clan" (school, social order) than working time. These characteristics are the result of unequal and incomplete education system which are typical features of backward countries.

In the recruiting examination or registration which is also dominated by many non-economic factors, similar evidences are not difficult to find both in Japan and India.

The reason for the long working hours in Japan is a mixture of necessity and affection for his workshop. The responsibility for deficient work is not made systematically clear, and it is often resolved by "coordinate responsibility" which is sometimes misunderstood as a good custom.

14. Interfirm Relations

The steel industry is more or less concentrated and systematized. This is due to the fact that (1) the process of steel making is a single systematic production from raw materials through transportation, iron making, steel making and to the final products. They need technically large facilities and large capital, so that it is profitable to integrate these stages into one or a few production systems. (2) It is also profitable for capital from its mobilization point of view. And historically the steel industry is organized by leading capital.

20. It is true that even in the U.S. many distinctions such as race, social elite, etc. exist. Yet they are exceptional or negligible in comparison with Japan and India.

In Japan the government took the initiative, and in the U.S. some major interested groups did in the early stages of its history.\textsuperscript{22} Usually organization of industry is connected with finance mechanisms.

There are differences in each country. In the U.S., the integrated companies monopolize 94\% of the pig iron and 87\% of steel; and companies with production capacities of more than four million tons per year cover 79.9\% of the pig iron, 72.3\% of the steel and 75\% of finished steel of the total production. The organization movement has been most active in the U.S., especially from 1898 to 1910, and the largest trust, the U.S. Steel Co. was organized in 1901. It was a holding company at first, producing 44\% of the iron ore, 42\% of the pig iron, and 66\% of the steel of the total production.\textsuperscript{23}

In spite of a strong trend toward monopoly in the U.S. there are also strong anti-trust and anti-monopoly powers which tend to prevent complete monopoly, hence competition between a small number of companies becomes severe. The situation is one of oligopoly. (The competition between a small number of large firms and a larger number of small producers is also hard.)

The competition in production, transportation, and sales (service and quality) among large companies is extremely hard. However, oligopoly results in a stabilized price (by price leadership system), and they cooperate in developing natural resources and deciding labor policies.

The problem is to what extent they can cooperate in setting a proper price. In this respect, Adams says, the industry stands at an important crossroad,


\textsuperscript{23} Organization of the U.S. Steel Corp. was completed before World War I.
competition or regulation. 24

Now about Japan. In early times the steel industry was monopolized by Nittetsu, a governmental enterprise, which was protected and encouraged by government power both in getting raw materials and in securing markets. After the Japan-Russian War and then prompted by World War II, private enterprises also developed wonderfully, such as Nihon-Kokan, Sumitomo, Kawasaki, and Kobe S. Co. But the government always had had a policy of "encouraging an integrated producer (Nittetsu)," so that Nittetsu monopolized the industry substantially. 25

After World War II, Nittetsu was divided by MacArthur's regime into two private firms, Yawata and Fuji Co., which are the two largest manufacturers now.

The private manufacturers who were not integrated companies (except Nihon-Kokan) and were called Kansai Semi-integrated Companies Group before the War, also have become integrated companies today. And today six big firms dominate the steel industry. These six are: Yawata, Fuji, Nihon-Kokan, Sumitomo, Kawasaki, and Kobe Steel Co.

These six, with many subordinated firms, compete with each other severely, making a characteristic "Keiretsu-ka" (Japanese-style oligopoly). This "Keiretsu-ka" stands not only on its technical basis (supplying raw materials to the subordinated firms) but also on its historical origin. This type of oligopoly has high flexibility in business fluctuations.

In India, from the beginning of its history, steel production has been monopolized by two large private enterprises, the Tata and IISCO.

24. Adams, op. cit., pp. 191-196 and also pp. 167-184. In the steel industry of the U.S., price policy has for many years centered around the movement of basing-point system (single, then multiple) price leadership, administered price, and price stability. The problem is complex, yet it is more stable in Japan and India.

25. About trust and cartel movements in Japan, see D. Sugaya, Steel Industry of Japan, Tokyo, 1957.
But the Indian government is now encouraging state enterprises and is planning to construct three state plants, each with more than a million tons of production capacity per year (Rourkela, Bhilai and Durgapur) in the Second Five-Year Plan, and after construction of these three plants, the total production capacity of India (six million tons in 1960) will be divided half and half into public and private enterprises.

Another problem of the Indian organization is keeping a balance between raw material, pig iron, steel and finished steel, in which the finishing process seems to be lagging behind the others.

15. Industry-Government Relations

In a country where the economy is not yet well developed, the steel industry needs government management or protection to make a continuous growth from the beginning.

In the U.S., where the steel industry developed on the free enterprise system, having a proper market and accumulating necessary capital, the government neither meddled with management of the private enterprises nor did it direct protection of them. On the contrary, the government stands as a supervisor of the steel industry rather than as its protector, because of a strong disposition toward monopoly. For instance, the government has supervised steel prices to protect consumers rather than manufacturers.

Of course, this does not mean that the government is indifferent to the industry. Protection of patents and aid to research work are most developed among these three countries. Sometimes protection has been done from the military point of view; for instance, the government helped in enlarging the capacity by modifying the tax system to allow a special depreciation during the War, and at times after the War it spent to help construction.
In Japan, the government has protected the industry directly and also indirectly from the beginning through governmental management, securing raw materials, subsidies, tariff protection, governmental purchases, technical advice, etc. Today, there remain only a few direct measures of protection, yet indirect means of protection, such as securing finance, are stronger than in the U.S.

In India, the industry resembles the early stages of the Japanese steel industry. The Indian government encourages the steel industry as the key of industrialization, and has given it one of the most important roles in the Five-Year Plan. The government itself plans to have its own plants. In this way, the Indian government controls and protects technical problems, price policy, developing raw materials, and so forth. It is often stated that the government seems to over-emphasize the development plan of the steel industry. The relation between government and private firms is closest here, sometimes to such an extent that it disturbed rather than helped the expansion of private firms by controlling prices.

16. Economic and Social Significance of the Industry

The steel industry is on the largest scale as a single industry in every national economy, not only because its products have a wide range of uses, both as capital goods and consumers goods, but also because it uses a great amount of raw materials, intermediate goods, transportation facilities, and much land. It also possesses large facilities and employs a large number of laborers. It has close connections with many other fields in the national economy.

Steel consumption per capita was 540 kg. in the U.S., 69 kg. in Japan, and 5.4 kg. in India; in other words that in the U.S. is 100 times as large, and in Japan 13 times as large as in India. For reference, the
national income per capita was $1870 in the U.S., $190 in Japan and $60 in India; in other words, the U.S. per capita income was 31 times and the Japanese was 3 times larger than India's. (These figures are annual averages of 1952-1954).

Although there is a close relation between national income and steel consumption per capita (the higher the income, the higher the consumption of steel), the relation is not proportional. The difference comes from the difference of industrialisation and the efficiency of steel consumption. The amount of steel consumption per capita is, like national income per capita, rather meaningless by itself. It is merely one of the evidences of development. The important thing is its relative position in the national economy.

The steel industry is connected with other industries. On the input side, it is the largest consumer of coal and one of the largest consumers of power and oil. On the import side raw materials imported in the steel industry constitute 7-10% of the total imports in Japan, but are very low in the U.S. and India. In employment, 6-7% of the total workers directly have been engaged in steel making in Japan. In value added, the steel industry has also a large proportion. (The proportion of value added of steel production to total industries was 8.1% in Japan in 1955 and 12.7% in the U.S. in 1952). In exports, steel constituted 4.4% of total exports of the U.S. and 13.0% of Japan (in 1955).

These figures also have little meaning by themselves. They have to be observed in relation to other factors such as domestic consumption, its efficiency, market stability, etc. These show the degree of importance of the industry, and there we will see differences between advanced and underdeveloped countries, to which I will refer in the next chapter.

Anyway, the steel industry has an important role in the present
economy. Because it is so important in the economic field, the social value of the industry is also rising. Roughly speaking, the steel industry in the U.S. is now at maturity and in Japan in transition and in India at the beginning of industrialization.

Finally we find the striking fact that many underdeveloped countries are hastening to develop the steel industry as a symbol of the "dignity" of modern nations (unfortunately sometimes without considering its economic justification).
CHAPTER III. JAPANESE INDUSTRY

Summarized Matrix of Hagen's OFRID

Hagen's OFRID is intended as a guide to basic and general research. Economists and politicians have to develop OFRID to diagnose and write a prescription.

We can summarize OFRID (1-16) in a matrix as follows on the next page.

The most remarkable feature is the differences in the histories of these three steel industries. Not only the origins and initial stages, but their motivations are quite different, and this has determined their present characters decisively.

As we have repeated often, the fact that the Japanese industry had been developed by the government under the slogan of "Fukoku-kyohei" has had notable influence on the entrepreneurship of today's businessmen, on the ways of financing, and on many other policies.

It is said, as in other countries, that the steel industry is "King or Mendicant." But, at least in Japan, this is true only in a sense that the steel industry fluctuates more sharply in the business cycle than other industries. From a political point of view, the steel industry has been protected most carefully, as "King" and never as Mendicant. It has had large-scale enterprises and strong influence on others like a King together with a bureaucracy or monopoly.

However, the fact that this King-like character penetrated into its history is not solely due to its origin and motivation. It has also been brought about by factor endowment. Growth

---

1 Some people in the U.S. say, "Prince or pauper" instead of "King or Mendicant."
cannot be kept continuous only by motivation; it needs a favorable environment.

What have been favorable factors among factor endowment for steel industries in these countries?

Matrix of Iron-Steel Industry

<table>
<thead>
<tr>
<th>Item</th>
<th>Advanced country (U.S.A.)</th>
<th>Semi-advanced (Japan)</th>
<th>Underdeveloped (India)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>In the natural course of development.</td>
<td>Industrialization &amp; military purpose (Fukoku-kyohei)</td>
<td>Industrialization To have &quot;dignity&quot;</td>
</tr>
<tr>
<td>Given conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td>Self-sufficient, well developed. Rich. Import of ore is rising.</td>
<td>Depends on import (Asia--pre-war) (U.S.--post-war)</td>
<td>Rich reserves but underdeveloped</td>
</tr>
<tr>
<td>Labor</td>
<td>Limited and expensive. High Skilled High mobility</td>
<td>Abundant but limited in skilled laborers, insufficient mobility</td>
<td>Abundant and cheap but unskilled, less mobility</td>
</tr>
<tr>
<td>Market</td>
<td>Big, Depends on consumer durable goods.</td>
<td>Medium size and unstable, depends on military use (prewar) &amp; export (postwar)</td>
<td>Stable but small Depends on Gov't expenditure.</td>
</tr>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Stable and highly developed.</td>
<td>Medium level (propensity to foreign tech.) co-existence of &quot;extremes&quot;</td>
<td>Underdeveloped</td>
</tr>
<tr>
<td>Capital Structure</td>
<td>Capital-intensive</td>
<td>Co-existence of two.</td>
<td>Labor-intensive</td>
</tr>
<tr>
<td>Price</td>
<td>Free price system and stable (single basing)</td>
<td>Supported price (prewar) Free price (after war)</td>
<td>Controlled price (dual price system; sales price &amp; retention)</td>
</tr>
</tbody>
</table>
Let us look at the demand side. Demand is larger in advanced countries than in underdeveloped. They are all sensitive to business fluctuation, even the U.S. In the U.S. the industry has suffered sharp fluctuations of production and profit. But the price has kept stable even in recession, so that the industry has been able to minimize the deficit and to recover quickly in boom. The Japanese steel industry lacks stability not only in markets (especially in export) but also in price. In India, the industry seems to have fewer fluctuations, but this is because the government gave subsidies or compensated for variations in prices. These differences in stability are connected to their market patterns; in the U.S. the industry depends on durable consumers goods which are unstable because of their high income elasticity; in Japan on military use in pre-war times, and on export in the postwar period (both unstable); and in
India the total demand is too small, though the market is stable through support by government purchase.

What about the supply side? From the viewpoint of natural resources, the U.S. is the most favored. It has abundant domestic resources and is well developed, having advanced technology, equipment, and transportation facilities. Recently, the propensity to import foreign ore is increasing, but there is a little uneasiness about developing resources abroad, since the industry has plenty of capital and technology at home, and since the sources of raw materials are secure and transportation cost is low. The problem is how to match the developing plan with that of underdeveloped countries, both economically and noneconomically. Japan, lacking domestic production, has depended on imports almost from the beginning. Before the war, she imported ore and coal forcibly from China and South East Asia (scrap was imported from the U.S. at low price), but since the war the propensity to import has increased substantially, since these previous advantages had been lost. It is true that the quality of imported materials has been raised by changing the source to the U.S., but the relative price of these raw materials has gone up. This is thought to be an obstruction to the growth of this industry in the near future, in spite of technical progress.

In India, natural resources are enough to meet demand, yet they are under-developed by lack of capital, technology and transportation facilities.

Labor situations are also dissimilar. They all have contributed to development in their own ways; in the U.S., labor is expensive generally but has high mobility, it is well educated and trained. Therefore, this scarce labor is fully utilized. Because of this shortage in supply, wages go up and the entrepreneurs are stimulated to adopt new technology which will save labor uses.

On the contrary, in Japan, in spite of the abundance of labor, it lacks mobility, so that sometimes, "shortage in abundance" happens. The reasons for lack of mobility are (1) the divergence in wage level is very wide by occupation and by district (2) a deficiency of dwelling places (3) lack of proper skill, training and education (4) family relations and other non-economic factors, which resist change. In this respect, the employment problem of Japan is not that of demand-and-supply but that of education and social policy.

This special character of Japanese employment-abundant, but short in a necessary phase or place—is connected with its peculiar production system and technology. In the center, wages go up and competition with foreign countries is hard, so that industry becomes more and more capital-intensive by adopting new machinery, equipment and technology, whereas in outside fields within the steel industry labor is abundant and cheap,
so that the progress of technology is limited. Differentials in wage, technology and income are meaningful quantitively and qualitatively; this corresponds to the co-existence of quite different types of groups.

The case of India is more troublesome. The class structure, deficiency or dwellings, lack of skill and education, and bad weather are obstacles to labor mobility. But what is worse, population is too abundant and labor is too cheap. The motivation for adopting new technology is weak. But within this field, changes happen gradually--by the growth of labor unions, wages of non-skilled laborers become relatively lucrative (wage differentials are lessening, so that, in contrast to Japan, mechanization proceeds at the fringe rather than in the center of the economy.

Capital mobility, essential to development, is highest in the U.S. In Japan, there were shortages at first which were covered by government aid. Today, enough capital is available overall but availability is unbalanced for some firms and areas. In India, it is short in amount, so that they still depend on foreign capital.

As we mentioned so far, the patterns and mechanisms of development differ in each country; the three countries have quite different types of factor endowment. Every country has its own specialty in every field: in technology, in labor, in capital,

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3 Rosen C., *Industrial Change in India*, p. 147. He says that the hypothesis of an "unlimited" supply of labor does not hold true economically in the organized manufacturing sector in India.
in price mechanism and so forth.

Then, what is the characteristic feature of Japanese industry?

Historical Features

The fact that the steel industry of Japan has been developed by the government under the slogan of Fukoku-kyohei (Enriching the Empire and Strengthening Military Power) has influenced many sides of the industry. Its influences remain strong even today when the enterprises have become private enterprises. Once, the budget for enlarging capacity in Yawata-Seitetsu-sho (state enterprise) was determined not by economic debates but by the balance of power between the army and navy, or between political parties. A similar thing is happening even today: government expenditures on the steel industry are sometimes decided by the balance between former state enterprises (Fuji and Yawata) and Zaibatsu-kaisha (Sumitomo, Kawasaki and Kobe).

The fact that it has been developed by government power means that the course of development is accelerated artificially, in other words, in a normal case of development. (1) ursprüngliche Akkumulation comes first. (2) a monetary system is developed (3) feudal restriction to economic development is diminished (4) the national economy develops naturally to international markets, and (5) private capital grows up independently. But in the case of Japan, this normal course of development has been modified for many reasons; namely (1) there still remained strong feudalistic ways of thinking, feudalistic social orders and
political systems (2) the monetary system and external economy developed rapidly but not fully from the latter half of Tokugawa (even in Sakoku), (3) dangers of foreign aggression existed so that the need for economic revolution became drastic (4) its industrial policy led by the slogan of Fuku-kyosh, needed strong government leadership and protection. (5) on the other hand, Zaibatsu companies (including the steel industry), which were started as private companies at the beginning, developed as mercantile capitalists rather than industrial capitalists, having less capital and small markets in both domestic and international fields. Zaibatsu accumulated capital in mercantile ways and then invested it in industries. This is typical in the history of Zaibatsu's mining, heavy industries and chemical industries, and it is easy to find evidences in the firms' histories. Though this trend is not so pronounced in the steel industry, yet easy dependence on imported scrap in prewar times was more or less connected with this character of capital.

Anyway, the history of the steel industry of Japan had been a history of competition and co-existence of integrated companies (state enterprises) and semi-integrated companies (Zaibatsu) until recently.

**Structural Features**

(1. Factor Endowment: Allocation and Markets)

Factor endowment, such as resources or labor, and the market, are quite peculiar in Japan. How are they combined in the national economy as a whole?
At first, the steel industry developed itself independently as a leading sector apart from others, protected by the government. When it developed to a certain level (say around the time of the Japan-Russian War), dependency on other industries gradually increased. By supplying materials and markets for other basic sectors, like railways and heavy industry, it acted as a leading sector and gave a "big push" on the one hand, and was stimulated by them simultaneously, on the other. But, the uneasiness of an unstable market has always accompanied the military market before the war and the export market after the war. As long as these markets are secured, there is no uneasiness, but they were not guaranteed. The national consumption level has been too low to depend on the consumption market. Low consumption meant high savings, high investment and high growth. But, as the industry grew further, consumption markets were reduced relatively, and therefore it was compelled to depend on a military market and to export more and more. While it finds markets in military use and export, the capital works well. And as dependence on others is deepened, whole markets are being enlarged. But, once these external markets shrink, the balance between the leading sector and the others is destroyed.

As is often said, there is a certain relation between national income and steel consumption. But, there are two types: one is a relatively high consumption pattern (high ratio of steel consumption per capita to national income per capita) like Japan, and another is a relatively low consumption pattern (low ratio of steel consumption per capita to national income per capita).
like the U.S. or India. The reasons why there is a gap between the income level and the steel consumption level are complex: They relate to the degree of industrialization (the lower the income level the lower the consumption), the degree of productive efficiency (the higher the degree of productivity the lower the steel consumption) etc. The high consumption pattern of Japan has been brought about by the underdeveloped condition of the machine industry. The lack of demand in the machinery industry has been covered by export and military use so far.

Until economic development reaches a certain level, it is necessary to give a certain industry (leading sector) priority, but once interdependence among industries has been established, the extent of priority should be limited within the availability of the external market.

The Japanese steel industry has fortunately had an adequate external market so far, but there will be a danger in the balance of the market unless the machine industry makes progress in the future.

In other words, the steel industry in this country has "fortunately" developed without a stable market. But "fortunately" is "fortunately"; it does not guarantee the future.

Structural Features
(II. Marginal Supplier in the World Market)

The next characteristic is instability in export markets.
The export market has covered any shortage in the domestic market so far. Though it is regarded as a normal promoter of economic growth (not as a military market), there is uneasiness about it, because the Japanese steel industry is a marginal supplier in the world export market.

Export of steel in Japan began soon after the industry's establishment, gradually increased, and in 1935, 10 percent of the total production was exported. Main markets were China, Manchuria and other near-by countries and steel was not an international good in a strict sense. Export was replaced by military use between 1937-1945, which occupied 49-55% of the total steel consumption. After World War II, military use was once again replaced by export and the special purchases of the U.S. Army. The export ratio to total production increased from 13% in 1948 to 24% in 1954 and 1955, approximately a quarter of the total production. And today, steel export covers 14% of the total export, and is the largest export next to textiles.

But the problem is its stability. The amount of export fluctuated widely. The following table shows the proportion of main steel export countries to the total world steel export from 1952 to 1955.

<table>
<thead>
<tr>
<th>Country</th>
<th>1952</th>
<th>1953</th>
<th>1954</th>
<th>1955</th>
<th>Range of fluctuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>11.6</td>
<td>14.0</td>
<td>13.0</td>
<td>12.0</td>
<td>11.6-14.0</td>
</tr>
<tr>
<td>U.S.</td>
<td>22.8</td>
<td>18.0</td>
<td>15.0</td>
<td>16.0</td>
<td>15.0-22.3</td>
</tr>
<tr>
<td>Belgium</td>
<td>29.0</td>
<td>26.0</td>
<td>27.0</td>
<td>27.0</td>
<td>27.0-29.0</td>
</tr>
<tr>
<td>W. Germany</td>
<td>10.8</td>
<td>12.0</td>
<td>15.0</td>
<td>13.0</td>
<td>10.8-15.0</td>
</tr>
<tr>
<td>France</td>
<td>16.0</td>
<td>23.0</td>
<td>23.0</td>
<td>24.0</td>
<td>16.0-24.0</td>
</tr>
<tr>
<td>Japan</td>
<td>10.3</td>
<td>5.0</td>
<td>7.0</td>
<td>8.0</td>
<td>5.0-10.3</td>
</tr>
</tbody>
</table>
Impatient planners anxious to force the pace of development must always remember that people are people, not inanimate objects. Ignore their customs and their ancient prejudices only at your peril. And remember, each nation is different.

P.A. Samuelson
Typicalness and Further Study

The purpose of industrial comparison is to make the character of an economy clear and thus make a development plan rational by basing it on accurate analysis.

Today almost every country has its economic development plan. Most of them generally deal with the economy as a whole and pay little attention to an individual industry-plan, which is usually made independent of the trend of the economy as a whole. This lack of proper analysis and planning for industry has become one of the main causes of failure in carrying out development plans.

The comparison of the steel industries in three countries shows the fact that not only the structure and level of industry but also its position in the total economy differ from each other and that the steel industry of Japan has been based on "duality". Without considering this fact, we can make neither a macro-model nor a semi-macro-model (industrial plan).

Although every industry reflects the features of the national economy, this does not mean that the steel industry alone may represent the national economy. The national economy as a whole develops as a magnitude of many factors and therefore an individual industry, however typical it may be, can represent only one phase of the national economy.

This suggests a limitation of a case study. In order to get generality, we would have to make many other case studies. For instance, the duality of the economy will finally be proved by getting evidence from other case studies of agriculture, small-scale industry (though suitable data are available).

1. There are many meanings given to the word "plan". It is confusedly regarded as or distinguished from the word "project(ing)", "program(ing)", "model building" or even "forecast(ing)". The definition must be determined by historically considering the objectives, targets, and the means of the plan.
difficult to obtain) or the textile industry which seem to represent one extreme of this duality. These industries may or may not supply the same evidence as the steel industry. It is questionable.

Further study on the following points is required.

(1) More case studies by using OFRID. There may be many different methods for making international comparison of industries, but it would be most convenient in these cases to use Hagen's OFRID. From Hagen's basic OFRID we can develop further investigation according to the purpose of the study. The more case studies the better it will be. After this case study (the steel industry), studies of the textile industry, chemical industry, small-scale industry, or agriculture are the most desirable.

(2) To arrange and adjust basic data. Although the reliability of basic data as well as the speed of obtaining them have been increased, differentials in accuracy among the various data are still large, particularly in international comparison. It is hoped that these divergences as well as errors can be eliminated.  

(3) Expand the historical and regional scope of the data, and establish uniform concepts internationally.

To eliminate the factors of business cycles, wars or calamities, and to obtain the trend, at least twenty years of observation is needed.

The problem in this case is: What is a proper deflater and what is a proper exchange rate? These are quite difficult problems, and some people deny the significance of international comparison because of them. It is true that it is better to do a little correctly than to do a lot with many mistakes, yet in this case (international comparison), we must

2. Indifference to basic data has often caused mistakes in carrying out economic predictions (plans). See, Scheffler, "Failure of Economics."
not be afraid to make mistakes in order to get better results. Here I use the ordinal official price index and the official exchange rate for the time being.

(1) The points mentioned above in (1) to (3) are the problems of individual industry. We have to aggregate them to get the proper relation between individual industry and the national economy as a whole.

In this respect, money-flow and commodity-flow of the whole economy which show/circulation and distribution patterns of money and commodities in the same terms must be prepared first. And only in this way can we compare different industries in the same terms from a national economic point of view. Of course, the whole picture is desirable, but for the time being, we have to get at least a flow-sheet around the given industry.

(4) To try to make other classifications besides the traditional industrial classification of C. Clark. Clark's classification (primary, secondary, and tertiary industry) is the most popular and the most convenient in international comparison of economic structures (admitting some recomposition). But I would like to suggest making other supplementary classifications. For example, it would be useful for the analysis of "duality" to divide the whole economy into two sectors: modern and pre-modern (some classification which corresponds to "duality" no matter what it may be called). Dr. Singer has already attempted this in his theory of developing underdeveloped countries, and Professor Woytinsky also suggested it when he visited Japan. However, these are supplementary, because Clark's traditional classification is well developed at the present time. On the contrary, new classifications which might show


4. Prof. Woytinsky's informal discussion with Mr. S. Ohkita in Tokyo in 1957 (by the report of E.P.A. of Japan, 1957).
"duality" might be rather complex, and it will take much more time to get available data from every underdeveloped country.

**Technical Procedure of Inducing the Industrial Plan from the Macro-model**

To make a future plan of an individual industry, we have to get an economic bird's-eye view of the future economy as a whole. Then we have to examine how the industry (say, the steel industry) would be under such-and-such conditions. And also we have to test some hypothetical cases with the possible policy to find the most effective way. Finally, by trial and error, we have to adjust the whole picture by making some political assumptions. These steps in making an economic plan can be summarized as follows:

First step. To get a rough outline of the general program.

This is a preparatory step that is "to supply a bird's-eye view of the pattern of future development of the country, and to show the possible and the most desirable development of national product and its components." It means making some alternative program (a general program which we need not take too seriously, to be used as a framework) using various data and methods. This includes the following procedures:

1. **Rough estimation of the possibility of development.** Readiness of the government for preparing the plan, degree of cooperation of the people, foreign assistance, long-range weather forecast, world political situation, and other factors which relate to the framework of planning.

2. **Estimation of "optimum growth rate".** To establish normal condition by eliminating the influences of short-run business cycles and estimate the normal growth rate (normal trend curve). This method is based on the fact that simultaneous determination by simultaneous equations which reflect the

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6. Ibid., p. 11.
general equilibrium is actually hard to get, so that we have to adjust, by trial and error, some single determinant equations with the assumption that "others remain constant". In this case, national income comes first.\(^8\)

Second step. To examine the factors limiting economic development. This procedure is to examine various elements used in the first step and conclusions drawn from the first step:

1. Estimation of population (especially the labor force population)
2. Rough estimation of import demand using the concept of "propensity to import" (average and marginal)
3. Rough estimation of equation \( gc = s \) by using a capital coefficient.
4. Estimation of consumption trend by using a consumption function (by region, by age, by class)
5. Testing the possibility of bottlenecks (for instance, transportation, steel supply, energy supply)\(^9\)

These procedures as well as the former are rather preparatory so that the picture we get here is a temporary one to which we have to return later. This is also a macro-model.

Third step. Breaking down the macro-model to an individual industry from a structural point of view. In steps 1 and 2, there is no direct analysis of individual industries. They suggest only some notabilia in making an industrial project.

First of all, here again, we have to describe the structural static model mechanically rather than the planned model without assuming too many

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changes in economic policies.

The methods that may be employed to make a model satisfactory range from primitive trial and error to highly sophisticated mathematical technology. Choice of methods depends on the experts making the plan, the nature of data available, and the nature of a given industry. But, in general, the outline of procedure can be summarized in the following models. (See the table on the next page.)

This model is static, based on actual performance. The variables and parameters are varied with planning term and the purpose of the plan. The following are some details.

1. Export demand.

The export demand is a function of the balance of price between export goods and competitive foreign goods, and of the national income of foreign countries. Amended variables are some non-economic factors (import restriction of foreign country, speculation, etc.) and changes in relative prices.

Japanese steel export acts as a marginal supplier and, in this case, export demand is not linear in relation to foreign national income.

2. Consumption.

Domestic demand is the total of direct consumption, intermediate use as capital goods and changes in inventory.

Of these domestic demands, direct consumption is a function of family income and of the ratio of relative price of a given commodity to average consumer prices. Amended variables are rates of substitution on account of technological change (both plus and minus: for instance, steel substitutes for wood, and steel is replaced by plastic) and the consumption coefficient
## Industrial Model

### Demand side
(distribution of output; estimation of market)

1. Export  
   - actual performance, income elasticity, price elasticity and non-economic factors

2. Consumption  
   - actual performance, family income, income elasticity, price elasticity, substitution rate, consumption coefficient

3. Capital Goods  
   - (direct and intermediate use)  
     production of final goods as functions of investment (government expenditure and construction)  
     amended variables (same as for 2)

4. Inventories  
   - normal stock level, change of growth rate, and other non-economic factors

5. Adjusting factors  
   - relative price, non-economic factors

Total  \[ D = k (1 + 2 + 3 + 4) \]

Plan
- Selling plan
- Market plan

### Supply side
(allocation of input factors)

6. Location  
   - area, weather conditions, transportation facilities

7. Production factors  
   - raw material (supply, price, consumption coefficient)  
     labor (supply-demand balance, price, mobility and productivity)  
     capital (supply, terms, productivity)

   first: assume free system base  
   then: determine variables considering changes of production factors and technical changes

8. Import  
   - production and productivity trends in competitive countries

9. Adjusting factors  
   - government policy, competition and regulation

Total  \[ S = k' (7 + 8) \]

Plan
- Investment plan
- Equipment plan
- Production plan
- Employment plan
(rationalization of use)

3. Demand as capital goods.

This consists of intermediate use and final use. Both of them are functions of output of final products. Variables are amended by substitution rate and consumption coefficient. When the output of final goods is not available, we use consumption or investment in toto indirectly.

In the case of steel demand, demand in the auto sector, for instance, is a function of auto production or family income. Demand in the machine industry is a function of output of the machine industry. In a sector in which the product is used directly, demand for the given good is linearly related to output of the demand sector (steel for construction use and investment in construction sector).

If it is possible statistically, we have to break down these demands calculated for the national economy as a whole into some groups: elasticity of demand may be varied according to income group, age group, regional group (geographical distribution of population as rural and urban).

4. Inventory demand.

This is a function of changes in the output level, and also is a function of changes in the growth rate and is amended by changes in relative price. (Also, it should be amended by non-economic factors as war, speculation, etc.)

5. Adjusting factors are the changes of relative price, which has effects on the substitution rate also. These are also modified by non-economic factors.

10. U.N., Analysis and Projections of Economic Development, Chapter IV.
6. While 1-5 show the demand side, the following (6-9) show the supply side. Supply is shown both in monetary and in physical terms. Location is one of the variables, which cannot be quantified. Also, transportation conditions must be considered.

7. Domestic production is obtained by production equations, main factors of which are raw material consumption coefficient, labor productivity, and capital productivity.

Future price is determined by marginal cost which depends upon the cost of production at the existing level of output, cost for changing output level, indirect taxes, profit balance, and cost for external factors.

These calculations are based on assumption of a free system; free competition, full employment, homogeneous employment, free movement of capital, no restriction in getting materials, etc. In planning we have to determine the variables first according to the purpose of the plan and the given conditions. (Changes of price and supply of production factors, and technological changes must be considered.)

8. The level of imports is determined by marginal propensity to import and price elasticity. It also is influenced by the production level and productivity of competitive goods in foreign countries.

The distinction between competitive and non-competitive goods is rather optional.

9. Adjusting factors are competition, agreement, and government policy. Non-economic factors are also important variables (includes foreign policy) as we shall see in the next chapter.

As I mentioned before, this is a structural model which is a kind of supply and demand model. In order to get a planned model from this static model, we have to plan variables first and then solve the equations (equation of determination and of definition) checking them by the macro-economic method mentioned in steps 1 and 2.
From Model to Plan

This is the problem of changing the static structural model into a dynamic planned model. The former is introduced by some functional equations and shows the rough relationship between an industry and a national economy.

In planning, one way would be to assume the planned variables as constant. However, it would be unrealistic because of instabilities of the structural variables and parameters. It would also be dangerous to regard this determinant equation as definitive. Particularly in Japan and in India the variables and parameters are quite unstable, even gotten from long-term observations. Everything is changing in these countries. Even in the U.S., where everything except technology is more stable than in India and Japan, it is said that many failures came from regarding variables constant. This would be truer of a country where transition is just beginning or has just begun.

The following are some notes on changing a structural model to a plan suggested by the case study.

First, planning must be considered on the basis of the specific characteristics of a country. Planning usually has two aspects: generality and speciality. A lack of either makes the planning incomplete.

For example, an economic plan in Japan made in 1956 which was called the Colm-model adopted a model that Dr. Colm had made for his forecasting American economy in 1960; in which the model building began from an

estimation of employment balance. But this kind of model has failed in Japan simply because the situation of employment is quite different in Japan and in the U.S. In the basic formula of the Colm model,

\[ \text{GNP} = m (rN-U) \]

where \( m \) stands for output per man, \( r \) for the ratio of the labor force to the population of working age (N), and \( U \) for the total number of unemployed.

\( U \) and \( N \) cannot be estimated for Japan in the same way as for the U.S. Conceptions of \( N \) and \( U \) are, rigidly speaking, different. Usually these are estimated under an assumption of a situation close to full employment and sufficient mobility in the labor market. Japan has had no such conditions. Even in modern enterprises which have relatively high mobility of labor, it is difficult to discharge workers or to change their positions according to business fluctuation or by the adoption of a new labor-saving technology. On the other hand, there is a mass of laborers in the fringe of industry who "are employed last and are dismissed first and in the easiest way." In such conditions, neither a balance of laborers nor marginal labor cost is determined in the same way for Japan as for an advanced country.

The second is a limit of definition of the concept average. The figures used in a macro-model or semi-macro-model are average. There is a limit in using a concept average especially in Japan whose industries, as we have seen in the case study, are based on duality. In the very same industry, two different types of enterprises co-exist; one labor-intensive and the other capital-intensive. In this case, average figures have less meaning than the figures of a particular rank (i.e. a rank by size).

13. As I mentioned before, many economic theories of development originated in and were directed toward solution of Western problems. The economists of underdeveloped countries who have learned much from Western economies are apt to misapply the theories. We must learn from others, but we must not copy or imitate them. Prof. Malenbaum points this out in the case of Indian economists. (N. Malenbaum, "Who Does the Planning?" Nov. 1956)
Particularly small-scale industries have characteristics that are different in semi-advanced countries from those in other countries. In general, as Professor Rosenstein-Rodan points out, large and small industry complement each other and at a later stage the larger begins to replace the small. However, in a semi-advanced country like Japan, their coexistence maintains the nation's growth. Each small enterprise, as a marginal supplier, has its own peculiar type of employment technology and other structures. The differentials in wages and income have different meanings according to country. The reason some sociologists do not agree to regard the maximization of per capita income as the highest economic policy in underdeveloped countries is that the maximization as a whole does not solve the structural problems of these countries. In Japan, the growth of GNP itself does not always mean the improvement of small-scale industries. On the contrary, a relatively poor situation in small-scale industries has often supported the rapid growth of the economy as a whole.

The third point concerns the directions of changes in variables. Such phenomena as mentioned above—the higher the rate of growth, the worse the situation of a certain group of small industries—is a quite different type of dilemma from that of advanced countries—such as the better the employment situation, the slower the growth of labor productivity. There are many similar cases; for instance, a general fact that the higher the income level the higher the saving ratio, is not always true in Japan, because of the incompleteness of the credit system, lack of social insurance, etc. Thus the economic variables are not only unstable but changeable in a direction opposite to that of the advanced countries.

Sometimes the influences of population on economic growth, the law
of diminishing returns, or the direction of technical progress operate conversely in advanced countries and in underdeveloped countries. One of the key points in making an economic plan is how to judge this direction of changes in variables. And the case study may be helpful in this respect.

By the case study we can understand the story of an industry, but we must not stop there. We have to knit them and make a plot of development. In other words, we have to return once again from the case study to the overall projection set at the beginning and adjust the industrial plan and macro-model using the trial-and-error method.

Building a structural model is only the first step of planning, for which figures are somewhat suggestive but not decisive.

"The accomplishment of such a task will show where the weak points of the analysis or materials utilized will be, and will enable the technique to be established on sounder basis."

Then, what are the principles of planning according to the case study?

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CHAPTER II. BASIC PRINCIPLES OF PLANNING IN SEMI-ADVANCED COUNTRIES

General Features

Economies of various countries are varied in their factor endowment, stages of economic development, and structure. Future courses must conform with their features.

Today almost every country has its own economic plan whatever it may be called. It seems to me that there is an obvious distinction between plans of advanced countries and those of semi-advanced and underdeveloped ones. These three groups will be described in the next table. Referring to the case study in the steel industry, let us examine these three types.

Generally speaking, in the case of the economic plan of an advanced country, the word "plan" is used in its weakest meaning. It often implies forecasting. This is because these advanced countries are already in "continuous growth" and there is little need to change the direction of development at present.

They sometimes have a twenty or fifty-year or even longer-range over-all project, as a bird's-eye view, from the viewpoint of international cooperation, national security, change of technology, and change of resources. As examples, we can include in this group the Paley Report, the Millikan-Rostow Proposal, the Rockefeller Report of the U.S., the Gordon Report of Canada and Industrial Distribution Plan of the U.K.

At the same time these countries usually have short-run projects (annual plans) as regulation of business fluctuation. Both in the U.S. and the U.K. there are annual plans which are made as supporting data of the national budget.  

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1. See Chapter I of Part III.

2. Here, I exclude the cases of socialistic countries intentionally. These countries have economic plans in the most rigid sense, and will present many suggestive evidences about planning theoretically and practically. But, I will not refer to them because of their peculiar economic principles and structures which differ from those of so-called free countries. (cont'd p. 3)
<table>
<thead>
<tr>
<th>Item</th>
<th>Advanced Country</th>
<th>Semi-advanced Country</th>
<th>Underdeveloped Country</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic characteristics</strong></td>
<td>forecasting; maintain stabilization by adjusting business fluctuation.</td>
<td>forecasting and projecting; maintain continuous growth and correct imbalance.</td>
<td>projecting; big-push and bring to continuous growth.</td>
</tr>
<tr>
<td><strong>Objects</strong></td>
<td>strategic and international programs in a special industry or natural resources regional plan</td>
<td>over-all (particularly in employment, balance of payment and investment); bottleneck industry; regional plan</td>
<td>over-all (particularly in leading sectors, overhead capital sectors and foreign aid inducing sectors; social and educational sectors.)</td>
</tr>
<tr>
<td><strong>Economic system</strong></td>
<td>free-enterprise system in capitalistic way.</td>
<td>relatively free system</td>
<td>free system limited by government (semi-socialistic)</td>
</tr>
<tr>
<td><strong>Terms of plan</strong></td>
<td>short (annual, in budget)</td>
<td>10 to 20 years</td>
<td>series of five-year plans. (in practice, five-year plan)</td>
</tr>
<tr>
<td></td>
<td>long-run (20 years or more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Allocation of investment</strong></td>
<td>balance of sectors</td>
<td>balance; emphasis on export and bottleneck sectors.</td>
<td>priority on leading sectors.</td>
</tr>
<tr>
<td><strong>Role of Government</strong></td>
<td>inspector</td>
<td>adjuster (mediate); by government and business group</td>
<td>promoter (positive); by government and big firms often by foreigners (overseas Chinese and by management control system.)</td>
</tr>
<tr>
<td>(regulation and control)</td>
<td>indirect control by government and by oligopoly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(means)</td>
<td>budget (includes taxes, subsidies) and monetary system (central bank)</td>
<td>budget (taxes, etc.), foreign exchange and monetary system (central bank)</td>
<td>budget (tariffs, taxes, etc.) foreign exchange</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>depends on price-mechanism; well developed built-in stabilizers</td>
<td></td>
<td>price control; foreign aid; affected by non-economic factors.</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td>Paley Report, Millikan-Rostow Proposal, Rockefeller Report, Monnet (later Hirsch) Plan, Gordon Report</td>
<td>Five-year Plan of Japan Vanoni Plan</td>
<td>Five-year Plan of India and others</td>
</tr>
</tbody>
</table>

Besides those mentioned here there are international plans like the Schumann Plan, Colombo Plan, Point Four, etc.
A plan is often made by an individual industry in these countries. It is because a whole economy develops so stably that the industry can forecast its future course more easily than the industries of other countries. In the U.S., large firms mostly have long-run projects. In the case of France the plan has a slightly different meaning. The plan, named Monnet plan and then Hirsoh, has aimed at the modernisation of the industries supported by the Marshall Plan.

As it is illustrated in the case study, the interdependence of industries is well developed in these countries, so that a plan aims at balanced development rather than "priority". The individual entrepreneur has the highest responsibility in carrying out the industrial development plan and the role of the government is something of an "inspector". Control, if needed, is indirect.

On the contrary, in underdeveloped countries, the plans are always plans for "development" being at the very beginning (or before the beginning) of the course of "continuous growth". The government itself makes a plan under its responsibility and exerts its efforts as a "promoter" in carrying out the plan, in which the leading sectors are encouraged positively as a foundation of development.

Having a weak monetary system, a plan puts importance on capital formation and also on foreign aid, and the means of control are often direct. Although the plan is established from a long-run point of view, the principal emphasis is on the early years of the plan, which may be interrupted by business fluctuations in the world market or by other non-economic factors. A plan always covers not only economic but also...

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2 (cont'd from page 1)
The three groups (advanced, semi-advanced and underdeveloped) are not homogeneous. Within any one of the three, there would be some different types, as South-East Asian countries and Latin American in so-called underdeveloped class.

3. In the U.S. this is based on the "Employment Act" of 1946.

4. e.g., climate conditions, unstable government, the power of foreigners.
political, social and educational fields.

The plans of semi-advanced countries like Italy and Japan have other characteristics. (Though the stages and background of these two semi-advanced countries are different from each other,) The target for per capita income in the plan is, of course, the higher the better. But the point is not in bringing it into continuous growth or maintaining the growth but rather in correcting the social and economic warps on the course of development.

The difficulties are problems concerned with "duality", by which rapid growth has been sustained as mentioned in the case study. Such dualities as poor and rich, subordinating and subordinated groups, progress and backwardness have to be dissolved. But it is necessary to utilize the duality in an economic structure; in other words, to strengthen the interdependence of industries.

Therefore in the plans of these countries, a plan as a whole (as average) has less meaning than the problem of combination of industries, wage differentials, and income differentials.

At the same time, these countries have close connections with international trade through export and import channels, so that a plan in this field can become one of the important parts of the plan. Yet, they cannot control foreign markets as they want.

Thus, the role of government in carrying out the plans in these countries is as "adjuster". And control is usually indirect with some exceptions in temporary policy (as regulation of foreign exchange, unemployment relief measures, etc.).

The term of the plan is 5 to 10 years. Non-economic factors also have strong influences in carrying out the plan, though not so great as in the case of underdeveloped countries.
Terms of Plan (Long-range or short)

The term of a plan is varied from case to case; from a one-year plan to more than a twenty-year plan, according to the stage of development and the aims of the plan. Even plans with the same period of time have various kinds.

In the case of advanced countries, there are two types of overall plans. One is rather short-run which is to adjust business fluctuations as a principle of the annual budget; and the other is long-range which shows the future bird's-eye view corresponding to the structural changes and standards of foreign policy and defense policy. The figures of the latter are expected ones rather than targets. In the case of the steel industry, long-range plans lay emphasis on the changing pattern of material resources and direction of technical progress rather than on the rate of growth.

In underdeveloped countries, the plan deals with the transition from pre-condition to continuous growth, so that it should cover a long-range period (at least 20 years). But this period is so unstable actually that a medium-range plan (about five years) becomes the most important in practice. This five-year plan is succeeded by the next five-year plan; as the first, second, third and so on. This series of five-year plans shows a unit of economic development and also is free from economic fluctuation. It is said that "since the major business cycle is normally 6 to 13 years' duration, we may consider a sustained movement as spanning a period of at least 25 years' duration."  

5. Rostow suggested the length of time between take-off to maturity is typically about sixty years.

6. Meier and Baldwin, Economic Development, p. 4. The population trend must also be observed in this time series.
They have also short-run plans (annual) which have little meaning in these countries because they have not yet a normal business cycle and are affected by climatic conditions and other non-economic factors.

Economic plans in semi-advanced countries have medium duration. For instance, the economic plan of Japan announced in 1957 covers the coming five years. There are two meanings in that. On the one hand, the five years involved in the plan, the years 1958-1962 are regarded as a part of a longer period which covers 10 to 20 years in the future. More specifically, the targets set in the plan are guideposts for 1962, but the path continues into the more distant future. This is particularly true in the fields of employment, power, transportation, agriculture, forestry and other basic natural resources.

By this projection, not only an outlook for economic development, but also some ideas concerning political and economic cooperation with foreign countries are available. But as the period of the plan becomes longer the plan has more and more "expected" factors. This is because development will enter the stage in which Rostow's "durable consumers goods" become important, and because the economic structure changes, and also because these semi-advanced countries are so uneasy that the government, which has a responsibility in carrying out the plan, cannot take an active part fully enough.

At the same time, these countries have to have a short-run plan (annual), because they already have a business cycle and are influenced by foreign markets which fluctuate day by day. Of course, this short-run plan must be connected with a longer period plan. However, the tools for making plans are different from each other. For instance, the capital-output ratio used recently as a tool for making long-range
plans can never be used in making short-run plans or forecasts, while such parameters as the seasonal fluctuation index are not as important in long-run plans as in short-term ones. Or, the meaning of "stabilization" used in a long-range plan sometimes conflicts with that used in short-term ones. We often have to set aside the problem of employment in short-term projects to keep "stabilization".

In this respect, some people suggest making a long-range plan every year (as revolving plan and not as first, second, third, and so on). But in this case, the plan becomes equivocal.

Balance vs. Priority: Price-mechanism vs. Control

The national economies of various countries were controlled by government during the War and the period of rehabilitation from war-ravages. The governments were given the power of mobilizing and allocating the labor force, investment, natural resources, foodstuffs, imported materials and consumers goods, and they were sometimes given power over price-mechanism, including direct wage control.

These powers are compulsory. The problem is their economic effectiveness without saying anything about their morality. How do we deal with this problem?

The maximum growth and stability of the economy is thought, by the classical school, to be achieved through the following stages or equilibria, as Professor Rosenstein-Rodan points out: 7 (1) the allocation of a given stock of consumers goods; (2) the allocation of production on the assumption of a given stock of labor, equipment/land; (3) the allocation of investment on the assumption of a given stock of labor;

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land and capital; (h) a fourth equilibrium condition, the assumption of Say's Law.

But the functions which perform as decision factors for these equilibria are more or less interrupted by economic growth itself. In advanced and semi-advanced countries, the price mechanism works relatively well given the proper lead by monetary and commercial systems so that there is little need to adopt direct controls except temporarily in some fields like foreign exchange control.

There is no guarantee, however, that equilibrium between (1) total consumption and total production (2) production and investment and (3) investment and capital formation, will be attained by the "Invisible Hand." There remains a sphere where human control has to achieve an important role; the problem of investment allocation.

Why can the problem of "optimum allocation of investment" not be left to the "Invisible Hand"? The answers are:

First, the relative shortage of capital supply compared with demand. In general, the higher the rate of growth is required, the more capital is needed. But capital shortage in this sense has become less significant in advanced and semi-advanced countries. In some advanced countries, export of capital becomes urgent. The importance of the allocation of investment is a matter of quality rather than quantity. The problem is not "how much" but "in what way". This is quite a different case from that of underdeveloped countries who are still suffering from a shortage of capital.

Second, the divergence of aims of private and social (national or public) investment. There is a divergence between marginal productivity

8. I will not refer to a fundamental fact concerned with the private property system which distinguishes capitalism from socialism.
of private investment and that of social investment, which is a matter of differences in "criteria" in the purpose of economic activities between the private entrepreneur and the national economy as a whole. (This is the problem of "choice" which Marxists call "anarchism in production"). The rate and amount of interest they expected, and the time of receiving interest (and even the conception of interest itself) differ between private and public investment. 9 We can find evidence in the steel industry in Japan: the fact that the construction of blast-furnaces has lagged behind ingot production, or the fact that the construction of sheet mills had continued until an actual over-production.

Third, limitation of private investment as long-range investment. It may be several years before some types of investment bring returns, and private capital cannot afford this, on account of the lack of forecasting the risks, or the lack of mobility of the capital.

Fourth, investment concerned with the social overhead capital. This is indispensable to economic growth, especially during the take-off time. In this category we can include the investment not only for railroads, harbors, dam-building and irrigation, but also that for educational organisation and scientific research which perform important roles in technical progress and in the formation of skills.

By these reasons mentioned above, allocation of investment has become a most effective stratagem in carrying out the plan.

There are many measures of allocation: direct government spending, government purchase, tight-or-loose money policies of the central bank, tax system, subsidies, custom duty, foreign exchange regulation, and so forth. Usually the more advanced the country is, the more indirect

measures it adopts, since it has a good price mechanism and built-in stabilizers.

The fact that control is exercised indirectly shows a tacit consent among people that equilibrium is achieved automatically by nature. Once after economic development gains a continuous growth, it may destroy the price mechanism artificially and disturb the growth of productivity to give priority to a certain sector, and to push it preferentially as the leading sector.

In this respect, in the plan of advanced countries, the emphasis is laid not on priority but on balance, and priority is put only on a bottleneck industry which destroys the equilibrium temporarily. On the contrary, in the case of underdeveloped countries some investments are done first, (as social overhead capital) by which economic development is stimulated and accelerated. Such policy is needed where interdependence of industries has not yet developed.

In advanced countries, investment in a special industry often causes inflation, but in underdeveloped countries slight inflation caused by prior investments sometimes stimulates the development.

So far, I have used the words "balance" or "priority" as the relationship between sectors or industries, but not between firms of the same industry. As we see in "Keiretsu-ka" of Japanese steel industry, there is a balance within a given industry—the combination of firms. This will be explained later.

Criteria of Investment Allocation

The criteria of investment differ according to the stage of development.

10. The word "balance" is used confusedly in the literature. See Kindleberger, ibid., Chap. XII.

11. Japan after World War I is a typical example.
Let us review briefly the problem of the choice of industrial investment (allocation). This should be revised by doing additional case studies.

(1) Internationalism vs. Inner-developmentism

Today every country has international contacts. There is no closed economy.

From the international division of labor point of view, there is no opposition between internationalism and inner-developmentism but in practice the economic planner faces a choice of the two. Even in an industry, for example, the steel industry in Japan, the problem of choice between export and non-export often occurs.

In the U.S. such problems seldom occur, because the U.S. has less propensity to export and has an affluent domestic market. If they exist, they are the problems of exporting capital which become over-abundant in the domestic market, or exporting technology and management services.

In underdeveloped countries, on the contrary, economic structures depend quite heavily on the markets of advanced countries; they have a monocultured structure from which they try to be free by promoting industrialization together with political independence. Economic development in these countries means to get rid of colonialism, and in this case, inner-developmentism proceeds. Even in this case, foreign aid without political obligations is needed to support and stimulate development. (However, an excess shift to inner-developmentism causes inflation.)

In semi-advanced countries, internationalism and inner-developmentism stand together. From the point of view that Japan is lacking in domestic market and that its export market is not sufficiently stable (being for some exports a marginal supplier of the world market and faced with
import restrictions of dollar-short countries, or because of the low
elasticity of income in underdeveloped countries which are some of the main
markets of Japan), inner-developmentism may seem to be preferable.
However, "inner-developmentism" would be undesirable compared with inter-
nationalism from the point of view of the many difficulties with which
Japan is now contending, such as land allocation, the efficiency of capital,
trends in marginal costs, competitive power in foreign markets, the law of
diminishing returns and so forth. Therefore the policy should be "high
level of export together with high level of import (not always less
import)."

Inner-developmentism should be encouraged so as to lessen the relative
import/GNP ratio (propensity to import). For example, to expand machine
exports more than steel exports or to expand chemical-textile more than
natural-textile for which materials are all imported. 12

(2) Agriculture vs. Manufacturing Industry.

In advanced countries agriculture actually lagged behind manufacturing
industry. Agriculture itself became more and more industrialized, and
this seems to be quite natural from the viewpoint of the law of diminishing
returns and division of labor.

In the case of semi-advanced countries, though we have to add more case

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12. Many economists regard the "limited territory (land) and surplus
population" as a basic ground for internationalism. I disagree with this
view. The influence of population on the national economy is by no means
absolute. It is relative and variable according to productivity. If we
agree with the general vulgar view of internationalism we will have a
dangerous chance of becoming "colonialist." Some foreigners point this
out (e.g., "Possible Permanent Changes in Asia," by Y.C. Yang in the
Annals, July 1958. The author is Ambassador of Korea to the U.S.)

In this part, I use a word "inner-developmentism" in a narrow sense,
namely as a concept referring to a self-supplied type of economy (like
"autarky") as usually used. But if we regard it as something like "deepening-
ism" or developmentism in the domestic market, we must revise our view.
In such a case, the problem is concerned with the wage level, standards
of living, technical progress, etc. and does not stand face-to-face with
internationalism.
studies, it seems clear that in the long run the trend will be the same as in advanced countries.

The development of secondary industry must proceed to supply the capital goods necessary to industrialize agriculture and to absorb the relatively over-populated labor force in the primary sector into the urban sectors. Moreover, agricultural production in these countries is limited on the one hand by the law of diminishing returns which is counteracted to some extent by technological progress and is influenced, on the other hand, by an unpredictable seasonal factor.

In a country where the population is not so large and mutual supplement by international division of labor is possible, like some of the Latin American countries, agriculture still has advantages. 13

Anyway, industrialization is popularly desired, although too rapid investment in industry (or elsewhere) causes inflation. 11

(3) To which Industry of Secondary Industry?

This is a problem of choice (connected with the problem of balance or priority); say, (a) to light industries? (b) to heavy industries? (c) to social overhead cost sectors as transportation and electric power? (d) to communication and education? and so on. (I will not refer to the case of (d) here.)

The definitions of light or heavy industry, as well as the definitions of "balance" and "priority" are not always distinct. Here I regard/textile,


11. Land reformation which is essential to capitalization of agriculture must be done positively in any case.
miscellaneous goods producers (toys, decorator, etc.) and the food industry (food canning and other processing industries) as light industry, and metals, machine, and chemical as heavy industry, though these definitions are not always scientific.¹⁵

Let us begin with supporters of light industry, who usually are supported by evidence from the textile industry. Their bases of assertion are:

1. Heavy industry in Japan, as we have seen in the case study, has been developed for military purposes. However, a natural course of development should start from capital formation in light industries and then gradually shift to investment in heavy industries as accumulation goes on. This means to have sufficient "Organische Akkumulation" and stable consumer markets by which inflation can be avoided.

2. Some people favor utilizing for light industry the equipment of the heavy industries constructed during the war time as "bequeathed property" of the past. But this equipment is too old-fashioned.

3. Although it is said that the market for textiles was lost after the war, the textile industry still has advantages for exporting to advanced countries, where the economic structure is more capital-intensive and labor is more expensive than in Japan, from the viewpoint of international division of labor. The textile market is now narrowed more or less by political considerations which can be amended by diplomatic negotiation. Moreover, light industries which have been private enterprises have sufficient technology and selling channels.

¹⁵. The distinction is not the same (but nearly the same) as that of capital goods industries and consumer goods industries or that of capital-intensive industries and labor-intensive industries. My distinction is merely conventional. The distinction will be made clearer by adding more case studies.
On the contrary, those who emphasize heavy industries make the following assertions:

1. We should utilize the "bequeathed property" of the past (facilities, technology and skill) as far as possible, though they were built at the sacrifice of the "peace-industry" and have brought a high cost. History need not repeat itself.

2. The foreign market for textiles has entirely changed; namely, silk, which was once the largest export good, has lost its American market through the progress of synthetic fibers and the collapse of the mulberry fields during the war; and cotton products also have lost the greater part of their foreign market through the progress of textile industries of the underdeveloped countries and the progress of chemical industries. This "lost" proportion in the export market should be filled by the heavy industries' products.

3. On the other hand, the demand for heavy industries' goods in South-East Asia will increase as their industrialization progresses, and this corresponds to the pattern of trade between South-East Asia and Japan, "material-imports and manufactured-goods-exports". And certain types of heavy industry--those making auto products involving use of much labor or much more processing, including shipbuilding--have advantages to export to advanced countries.

4. Heavy industrialization has the possibility of making more opportunities for employment bringing more value added than light industry. This means, in the case of Japan, a low import-export ratio.

5. From an historical and empirical point of view (though this is not always theoretically accepted) many advanced countries adopted (or are adopting) an economic policy which gives first priority to these sectors as a desirable course of development.
There is another view which lays importance on investment in power and transportation. These are other kinds of investment which usually constitute so-called social overhead costs. It has become common sense to invest in these sectors in the early stage of development. As development goes on, these investments should be done from the viewpoint of "balance" gradually. Yet even in advanced countries, these investments widen external economy. However, the theoretical measurement of the effects of these investments is not yet established.

After all, the choice of investment must be determined by some criteria according to the purpose of the plan: (1) import/export ratio, or import/output ratio, (2) the rate of material turnover, (3) the terms of production, (4) the effective demand ratio in the world market--income elasticity, (5) the export/output ratio, (6) the productivity of equipment--rate of fixed-capital turnover, (7) returns/output ratio--domestic value added, (8) energy coefficient.

However, the problem of choice is rather a problem in the early stage of economic development (at the beginning of continuous growth). As the growth begins continuously and the economic structure becomes stable, "priority investment" shifts to "balanced investment." The criteria in this stage are such as bottleneck or multiple effects. The choice of light or heavy industry investment becomes the choice of adaptability to the world market. That is to say, how to utilize its own economic character to bring continuous and stable development. For instance, as we have seen in the case study, if a country has "duality" in its economic structure, economic policy should make the most of its "duality". In other words, Japan should stand with labor-intensive
advantages against advanced countries, and with capital-intensive ones against underdeveloped.

Steel is now exported to the market of underdeveloped countries in Japan. But, if by adding more intermediate processes Japan could change crude steel into highly processed products like ship-building and other machinery, in which Japan has labor-intensive advantages compared to advanced countries, then Japan could export much more steel in processed forms to the world market.

Thus the advantages in foreign markets are determined not only by the nature of individual products or by the nature of individual enterprises, but also by the patterns of economy as a whole.

Role of Government

Needless to say, the role of a government in making economic plans is dependent upon the stages of development.

In a democratic society, there are some fundamental policies for which the government is responsible as Professor Millikan has pointed out. However, the extent, and in what way a government should touch these policies is determined case by case.

As we have mentioned before, advanced countries, having stability and continuous growth, supported by price-mechanism, built-in stabilizers and free enterprise system, advocate the policy of "the less government control the better". They are "inspectors" who adjust fluctuations and regulate undue prices which interrupt free competition. Except in

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16. Millikan, "Objectives for Economic Policy in a Democracy," in Income Stabilization for a Developing Democracy (ed. by him). He has raised six principles: (1) minimum unemployment (2) ideal employment (3) consumer guided allocation (4) an optimum rate of saving (5) maximum technical efficiency (6) optimum income distribution.
the case of war or emergency, they do not use direct controls but indirect ones. Indirect control is effective in these countries, especially in the U.S. because of (1) a high proportion of government expenditure to total investment (2) an increase of government revenue (3) well-developed monetary system led by a central bank (4) well-organized built-in stabilizers by well-developed legislation (5) modernized non-economic sectors in the fields of communication and education.

Of course, there still remain questions about the reliability of these functions both theoretically and practically.

In underdeveloped countries, the government has a more positive role as a "promoter" of economic development and planning. Since the country has insufficient capital formation and underdeveloped monetary system, the government itself must do investing in basic sectors and sometimes take direct control over private industries and consumers, and sometimes allow slight inflation to encourage economic activities. The government is the leader, not only of the economic field but also of revolution in social, political, and educational matters. 17

A government in a semi-advanced country is required, on the one hand, to be "cheap" and to be a "mediator" or an "adjuster" adjusting short-run business fluctuations and dissolving bottleneck sectors. The government should keep some relation to private enterprises and consumers on the other hand, not too close, yet not estranged. It also has many things to do in non-economic fields.

Government controls are generally indirect (tax policy, monetary control by central bank, and even slight inflation). Direct controls

are few and temporary, such as investment to sectors having priority by public finance organizations or by export-import controls, which are one of the main policies of these countries (e.g., subsidies, prevention of over-competition, reduction of taxes, protection by tariff, changing the exchange rate).18

There are many difficulties for the government in semi-advanced countries. First of all, from a theoretical point of view, parameters and variables used in projecting are unstable, and what is worse, although the method of trial-and-error is the short-cut to improved planning (because "the proof of the pudding is in the eating" in social science fields), one failure may destroy everything.

The most delicate difficulty is a dilemma between "progress" and "stability". Economic development requires change, and change is sure to violate some existing institutions and hence run counter to some existing emotional current. These two principles of planning, progress and stability, often run counter to each other.19 As Professor Samuelson20

18. The change of the exchange rate occurs (1) when the international balance becomes so bad that even powerful dis-inflation cannot remedy it and (2) when the domestic price and cost structure shows a quite different pattern from the international standards.


points out, progress is an obstreperous and often cruel disturbance of the "status quo" and this is especially true in Japan where "duality" exists economically and politically. In Japan even small "change, arouses a wide resistance or sacrifice, sometimes in or from "conservatives" and sometimes in or from "progressives." 21

These countries are affected by the policies of advanced countries, so that the planning has to take into account those factors over which they have no power of control. This is another difficulty. (See the next section.)

It is quite natural that the governments of these countries with these difficulties are apt to have more interest in a short-run plan than in a long-range plan, the effects of which do not come out immediately. 22

International Relations

Every country is connected with other countries. The better the relations with the other countries, the more favorable for carrying out the plan.

"It may be true that all can make economic progress more effectively together than apart. But, there is always the chance that one can move faster and farther alone." 23

The problem is how to cooperate. Recently as an economic plan is made in each country, mutual cooperation plans between two or more countries also become more and more popular. There are many types; some are regional, like the European Recovery Program (Marshall Plan)

21. This does not mean that government should always be "neutral". As Professor Rosenstein-Rodan says, "Neutral government is as unrealistic an assumption as neutral money."

22. Usually these governments are weak. So it would be unreasonable to expect "long-run" plans of these "short-lived" governments. Finally, whether the plan is good or not is determined by whether the government is democratic or not.

and the Colombo Plan; some are concerned with specific sectors like the Schuman Plan; some are cooperative plans among underdeveloped and advanced countries, like the Point Four; and some others are only temporary agreements. In all cases, the principle of the plans is "mutual support", although the details and methods are quite different from each other. There is much literature which deals with this problem. I will refer to it, as far as it concerns the case study, here.

First, about its purpose: mutual support. From the view point of the international division of labor (comparative cost advantage), the most rational development can be brought about by extensive cooperation of various countries. For example, the reason that the steel industry of Japan has been able to make rapid growth and has become the sixth biggest steel production country of the world, in spite of its disadvantages in getting raw materials, is that it has made the most of "duality"; it has utilized the advantages of the labor-intensive aspect relative to the advanced countries and the capital-intensive aspect relative to the underdeveloped countries. But, suppose these advantages did not exist, then the steel industry of Japan would never make further developments because of the many disadvantages in raw materials. The steel industry would be surpassed by other industries. In the future, Japan has to shift the emphasis to higher processed industries such as the machine and chemical industry. Each industry (enterprise) will become more and more capital-intensive, but by adding more processing it will be able to keep the advantages of its labor-intensive aspect to the advanced countries hereafter.

International division of labor (comparative cost advantage) means, in the case of Japan, utilizing its duality, that is to say, properly
using the advantages of capital and labor. On this course, the steel industry of Japan should develop. It has to watch carefully the international transfer of capital and labor.

The case of India is rather questionable. In spite of rich reserves of coal and ore and wide land, if labor has less mobility and education and capital costs are high, the steel industry will be compelled to stay at the present level until the economy as a whole grows up to a certain level.

Second, about the meaning of mutual support.

This does not mean to cover a shortage by importing something physical and to carry out surplus goods by exporting them. Many countries export steel and import it simultaneously. An import may be required to provide capital equipment promptly, and not to cover the shortage of some products. Similarly, exports are needed to take advantage of comparative advantage in the use of capital, not to carry out the surplus. The physical relationship between an advanced country as an industrial goods exporter and an underdeveloped country as a raw material exporter shows nothing but the relation that, through G-W-G, capital operates as capital. In other words, the difference between an advanced country and an underdeveloped one is not that of physical products but that of mobility of capital and productivity.24

Third, about a limit for mutual-support. This is evident as we see in the case study. Mutual support in the world market is restricted, especially when compared with the pre-war condition, by many factors as:

1. collapse of a single world market. The world market has been

24. Specialization (a result of the division of labor) can also be explained by this logic.
relatively narrowed (for the steel industry of Japan, it means the increase of competitors and the restriction of exports to China). (2) Imbalance in the growth of productivity of production in various countries (especially the overwhelming development of the U.S.) and the diversity of the business cycle in various countries, which causes a "dollar shortage" in the world market. (The increase of dependency on the U.S. in the Japanese steel industry is an example.) (3) The divergence between industrialized countries developed by recent innovation and underdeveloped countries which are still stagnant as a monocultural economy. The divergence of economic growth is a result of "international division of labor" on the one hand, and it also interrupts the mutual support system on the other hand. The fact that the steel export of Japan has shown the tendency of dispersion instead of specialization reflects not only its feature of "marginal supplier," but also this change of pattern in the world market. Therefore, a regional plan (such as the Schuman Plan) does not always affect favorably the countries outside (such as Japan).

Fourth, about the balance of international payments. It is nonsense to try to keep a balance of international payments within a single industry (for instance, to settle a "balance of payments in the steel industry"). The balance should be kept for the economy as a whole. And this international equilibrium must be parallel to the domestic equilibrium. Of course, this is difficult. In a material-import-and-products-export type country like Japan even when the propensity to import is low, total export and total output do not increase parallel to import; imports tend to increase automatically as the country grows, whereas exports will not increase unless technology improves in export.

25. The divergence comes from that of development rather than that of elasticity of export goods. Kindleberger, The Terms of Trade, Chaps. 10 and 11.
industries. This can be remedied only by rapid industrialization (progress of technology, increase in capital used in industry, growth of the industries which do not depend on import materials). In this respect, the steel industry of Japan (and other industries also) has succeeded to some extent. In other words, balance has been maintained in international payments by the increase of exports and relatively small increase of imports (by the expansion of domestically supplied industries). This is proved by the case study.

As we see in the case study, there exists sometimes an industry which is thought to be disadvantageous from the viewpoint of comparative cost advantage. The reasons are various: (1) some industries can exist as marginal suppliers covering the gap of demand-and-supply in the world market. They are unstable and bring dispersion of markets; (2) some have advantages in location (transportation cost) though not competitive with others in production cost; (3) though not competitive at present, it is hoped that they become competitive in the near future. Until then, they are protected by tariffs and subsidies as infant industries; (4) or, although an industry is not competitive by itself, it has sufficient competitive ability when combined with other industries; (5) finally, sometimes the government supports the industry regardless of its competitiveness to keep "dignity" as a modern state.

India and Japan in their history present many evidences of these reasons mentioned above.


For reference, if marginal increase in income (monetary) $\Delta Y$, marginal increase of export $\Delta X$, marginal increase of import $\Delta M$, export multiplier $x$, marginal propensity to import $m$, then

$$\Delta Y = x\Delta X$$
$$\frac{\Delta N}{\Delta Y} = m$$
$$\Delta Y = \Delta M$$
$$\frac{\Delta M}{m} = x\Delta X$$

Hence if ($\Delta N = \Delta X$), $x = \frac{1}{m}$.

But in Japan $m$ is unstable.
In any event, the importance of an individual industry in the national economy or in the world market depends on the characteristics of the country concerned. And this fact will be made more clear by additional case studies.

This is also true in the case of an international plan such as the Schuman Plan or the Colombo Plan. Without considering these circumstances, the play may result in failure.

**Non-economic factors**

Economic development is affected not only by economic factors but also by many non-economic factors. The instability of economic variables and parameters is also affected by them.

These non-economic factors include a wide range as we have mentioned in Part I. Some of them stimulate the development and some others disturb it. For example, democratic cooperation of the people, pervasiveness of knowledge, active entrepreneurship, a well-developed social security system, etc., are favorable to economic development, whereas feudalistic restriction in employment, conventional social order, family clan and social clan (such as school clan) are unfavorable.

Even the same factor sometimes stimulates and sometimes disturbs the development according to the stages of development. For instance, the family system brings low productivity and low wages on the one hand, and sometimes it fosters an affection for the workshop. This is also true of the personal world view and consciousness of crisis.

Steel industries of the three countries present many evidences of these factors. The problem is how to measure (how to quantify or how to show in economic terms) these factors as economic variables. When

this task is done, an economic model will become a real economic model.

Non-economic factors as economic variables for development are classified into three groups: (1) social structure (2) structure of personality (3) world political structure. The following are some notes on these groups relative to the case study.

(1) Social Structure

This consists of political and social institutions and systems, social class (position), group (mass psychology, etc.

In many underdeveloped countries, religious class order fixes the occupation and interferes with the mobility of labor. These, however, are not made clear in the case study. In Japan, the intervention of military power in the economic fields (as non-economic power) was not favorable to economic development. Or, the motivation and the conditions of earlier times brought up the bureaucracy in the steel industry (once, they had been governmental enterprises) and even now when they become private enterprises, this tendency still remains strong. Today, more than a quarter of the directors of Yawata and Fuji come from officialdom, and similarly some of the positions as directors of the Zaibatsu firms are reserved for retired officials of the government.

Of course, there are exchanges of officials between private firms and the government in the U.S. But they are quite different types from those of Japan which are based on tradition-like convention. Usually these officials have been administrative men, but there have been many engineers also (e.g., the engineers of the Transportation Ministry often become

28. This classification was suggested by Hagen's lectures, "Non-economic Factors in Economic Growth," 1957-58.
chief engineers of private plants. Though they are engineers--consider that the position of engineer is usually lower than administrator in this country--these personnel exchanges bring close relation between firms and government.)

In the case of Japan, there is invisible but obvious discrimination between workers and staff, between upper staff and lower staff. It is seldom that the workers are promoted to the upper class staff no matter how they have raised productivity and/or how well-trained they are. They usually have to remain workers. And, more surprising, the discrimination between upper class staff and lower is also rigid, which is determined by school-clan and family-clan. The top directors of Zaibatsu were from the same family before the war. Even today, small Zaibatsu and local Zaibatsu which were not dissolved immediately after the war by the MacArthur Regime are still dominated by a family group.

Discrimination by school-clan which is seldom seen in the U.S. is also distinctive; discrimination between public university and private school, between administrative officers and engineers, especially the former, is tragic. For example, in the examination for service, the allocation of new employees is decided beforehand by the schools from which the applicants graduated, regardless of their abilities. And this social valuation of school career follows them as long as they stay in the firm--that means, in Japan, until their death.

These social structures sometimes bring order (discipline) and protect growth to some extent, but they gradually come to interrupt the growth. There are many evidences in the history of the Japanese steel industry, which is one of the most modernized industries in Japan.

29. There are many interesting facts in the U.S. in this respect. See Warner and Abegglen, Big Business Leaders in America.
(2) The Structure of Personality

This also has a wide range: knowledge of science, technical skill, knowledge based on external experiences, world view, some sorts of need, values, etc.

Some of them are favorable to economic development (leadership, entrepreneurship, responsibility, etc.) and some are unfavorable (personal hatred, servility).

Today the system of enterprise is becoming more and more complicated and the kinds of jobs have increased, so that it is becoming easier to find a suitable job according to one's nature. And the progress of management helps this tendency.

In the U.S. Steel Co. in the U.S., 142 types of jobs are divided into 38,000 kinds, and 250,000 workers are allocated to their jobs according to their abilities and natures. In Japan and India, this division has not yet been well developed, so that there are many complaints among workers about their positions which are often connected with social structure mentioned above.

In Japan, many workers oppose the "productivity increasing movement." It is because uneasiness about being discharged or fear of having labor strengthened, which are connected to the lack of a social insurance system and to affection for their workshops, etc.

The decision of investment is also affected by personality. 30

(3) World Political Structure

There are many conflicts and much rivalry in the present world; socialism and capitalism, advanced countries and underdeveloped countries. And even in the same group there are many differences in manners, customs

and cultures, friendship with others, emotional oppression by others, and so on.

These affect economic development both favorably and unfavorably.31

Needless to say, present economic policies of every country in the world have undoubtedly been affected by these world political structures.

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31. The steel industries of India and Japan (after the Meiji Restoration) have been constructed as "symbols" of the "dignity of the modern nation."
Finally, I will not write a conclusion. This paper is, as I mentioned at first, only to settle a hypothesis. And this hypothesis should be proved by many more additional case studies.

Until then, let us keep in mind, as Professor Duesenberry says:

"Although the prediction and control of the future course of events is one of the principal ultimate objectives of any scientific endeavor, the first task of any theory is to explain what has already happened. It is to be hoped that the set of hypotheses developed here will prove to be of some use in prediction and policy making in the future, but at the moment they must be regarded as hypothesis...."

(Duesenberry, Business Cycles and Economic Growth, p. 331.)
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