AGGREGATE ECONOMIC PROJECTIONS FOR THE DEVELOPING ASIAN COUNTRIES*

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I. SCOPE OF PROJECTIONS

The long-term projections for Asian economies, which were recently performed by the Economic Growth Research Branch of the Institute of Asian Economic Affairs, aim at determining the potentialities of economic growth in the 1960's in Asian developing countries by projecting their economic structure in 1970. These countries are now endeavouring to modernize their economic and social structures in line with their developing plans. The long-term projections will contribute suggestions as to the possibility of realizing these development plans.

Long-term projections for the Asian economy have been attempted by the United Nations, the Food and Agriculture Organization, and others.[1] ECAFE is now working on long-term projections for economic

* This thesis intends to explain some problems in the method of macro-economic projections; it is part of the report for fiscal year 1962/63 on the *Long-term Projections in Asian Economies*, undertaken by the Research Department for Economic Growth of the Institute of Asian Economic Affairs. For the particulars of the projections, reference should be made to the report.

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1 FAO, *Agricultural Commodities Projections for 1970* (FAO Commodity Review 1962), FAO, Rome, May, 1962; UN, *World Economic Trends, Study of Prospective Production and of Demand for Primary Commodities*, UN, New York, May, 1962; T. Kristensen and Assoc., *The Economic World Balance*, The Foreign Policy Society, Copenhagen, 1960; P. N. Rosenstein-Rodan, "International Aid for Underdeveloped Countries," *The Review of Economics and Statistics*, Vol. XLIII, No. 2, May, 1961, pp. 107–138.

growth in the region to be completed in May 1964; our Institute has co-operated by dispatching a staff member. It is noteworthy that most ECAFE countries since the beginning of the 1960's have made or are preparing long-term plans rather than the medium-term ones as in the past. As regards aggregate economic forcasting, projections for 1970 of the gross national product, investments, consumption, exports and imports, as well as the composition of the national income by industry were attempted at the beginning. However, for the lack of sufficient national income statistics, projections by country were feasible only in ten countries: Burma, Ceylon, China (Taiwan), India, Indonesia, the Republic of Korea, Malaya, Pakistan, the Philippines, and Thailand.

II. METHODS OF PROJECTIONS

Methods of long-term projections in Asian developing countries have been limited in scope and character.

There are relatively sufficient data in the foreign trade sector, but owing to difficulties caused by the lack of basic statistics, including national accounts statistics, much time was spent in collecting and arranging the data. As regards national income statistics, the United Nations' *Year Book of National Account Statistics* was used as the main source; its figures were supplemented by the official statistics of each country. Data thus collected were standardized at 1960 prices. For the conversion, implicit deflators were used; however, for the expenditures on the gross national product of certain countries, where implicit deflators could not be used, gross domestic product and export and import unit price indices were used.

Methods of long-term economic projections, used up to the present, are extrapolation of trends and models. The extrapolation of past trends is the simplest method, though not perfect for projections of growth accompanied by changes in economic structure. Consequently, the method of models was adopted, and the extrapolation of historical trends was used only for checking purposes. However, a simple extrapolation of models cannot necessarily be called complete. Most Asian countries are now intending to accelerate economic growth, and considering "intentional" changes in the economic structure, in line with their development plans. It is, therefore, necessary to revise structural parameters estimated from actual results in the past by investigating the progress of development plans in each country as well as by other relevant information.

1. Extrapolation of Trends

The first step is to compute the past trend in gross domestic product or gross national product of the ten-year period from 1950 to 1960. In this case, it is necessary to find the refraction degree of the rate of economic growth by computing separately the trends in the first half and the latter half of the 1950's.

According to the cross-section analysis by FAO and Kuznets,[1] in countries where the average level of national income per capita is low, the growth rate of gross domestic product is low, but it tends upwards with the increase in national income per capita; however, in cases where the national income per capita exceeds a certain level, the growth rate of gross domestic product again tends to decline. Further inspection of evidence is necessary in this respect; at any rate it will be necessary to supplement future economic projections by the analysis of the development stage and the type of economic growth.

For the computation of the trend based on actual past results, the method of least squares is usually used. There remains the question of the choice of function. Various types may be considered; those tentatively computed are given below.

1. $y=a+bt$
2. $y=a+bt+ct^2$
3. $y=a+bt+ct^2+dt^3$
4. $y=ab^t$ or $\log y=\log a+t\log b$
5. $\log y=\log a+t\log b+t^2\log c$
6. $y=ab^{ct}$
7. $y=\dfrac{1}{(a+bc^t)}$
8. $y=a+bc^t$
9. $y=a+b\log t$

In the above formulas, y denotes the gross national product; a, b, c and d are parameters; t indicates the time. When these functional formulas are applied to the gross national product growth in the 1950's in Asian countries, relatively favourable estimates are obtained by 1., 2., 4., 5., and 8. Thus, for the survey period of about ten years, the application of complicated functional formulas is likely to be of little significance.

The extrapolation of trends gives some suggestions as to the development process of individual economic quantitative aspects, such as

1 S. Kuznets: "Quantitative Aspects of the Economic Growth of Nations: Parts I and II," *Economic Development and Cultural Change*, October 1956 and July 1957.

gross national product, gross private domestic capital formation, etc. However, long-term projections for the aggregate economy directly through these functional formulas are not possible. This is because the extrapolated values do not necessarily assure the consistency of balance required in the composition of factors of national economic accounts, such as gross investments, savings, exports and imports, etc. It is, therefore, necessary to adopt the method of models to secure consistency of national economic balance.[1]

2. *Method of Models*

(1) Model of Aggregative Projections

In developing countries where dependence on foreign trade is relatively low, the international balance of payments is usually pointed out as an important bottleneck restricting the rate of growth. Especially, in the economy of most Asian countries, obliged by the progress of development to import the greater part of capital and consumer goods, since domestic industries are still undeveloped there is a strong possibility that the international balance of payments becomes a serious bottleneck for economic growth. It is possible to estimate the possible rate of growth under restrictions by the international balance of payments. For that purpose, a simple macro-dynamic model integrating the national economy is needed. The symbols of necessary variables are:

Y ; Gross national product (GNP)
Y_D ; Gross domestic product (GDP)
K ; Capital stock
I ; Gross domestic capital formation
S_D ; Gross domestic savings
S_F ; Net foreign savings or net capital inflow from overseas
C ; Private consumption expenditure
G ; Government consumption expenditure
E ; Exports of goods and services
M ; Imports of goods and services
T ; Net factor income from abroad
B ; National surplus on current account

1 Suggestions of economic-growth forecasting models for developing countries are given in: UN, *Programing Techniques for Economic Development with Special Reference to Asia and the Far East,* New York, 1960; UN, *Problems of Long-term Economic Projection, with Special Reference to Economic Planning in Asia and the Far East,* New York, 1963; L. R. Klein, "A Model of Japanese Economic Growth," *Econometrica,* Vol. 29, No. 3, July 1961, pp. 277–292.

L ; Employment of labour

The economic surplus, obtained by deducting current living expenditures of households, C, and government consumption expenditures, G, from gross domestic product, Y_D, in the year, t, is the gross domestic savings, S_D, necessary for capital accumulation.[1] Gross savings are invested within the country by allocation to gross domestic capital formation; the remainder gives the national surplus on current accounts, B.

In cases where gross domestic capital formation exceeds gross savings, there appears naturally an excess import of goods and services, and the national surplus on current account will register negative figures. This surplus can be defined as gross domestic savings, S_D, minus gross domestic capital formation, I. Based on this definition, the surplus is equal to the balance of exports and imports of goods and services, $E-M$, plus net factor income receipts, T. If gross domestic capital formation exceeds gross domestic savings, and the deficit is covered by foreign savings, S_F, or inflow of foreign capital, the surplus will be equal to net foreign savings. Consequently, in the national economic balance, the following formulas are established:

$$(1.0) \qquad Y_t = Y_{Dt} + T_t$$

$$(1.1) \qquad Y_{Dt} = C_t + G_t + I_t + E_t - M_t$$

$$(1.2) \qquad B_t = E_t - M_t + T_t (= S_D - I = -S_F)$$

(1.0) determines the relationship between gross national product and gross domestic product; (1.1) establishes the balance of gross supply and demand, and, at the same time, represents the supply function of investment funds. (1.2) is derived from (1.0) and (1.1).

The next problem is the choice of the production function. In a long-term economic projection established by the EEC and the FAO the Cobb-Douglas' production function was used with variables of invested capital, K, input of labour, L, and technical trend, λ.[2]

$$Y_D = A_0(K)\alpha_1(L)\alpha_2 e^{\lambda t}$$

When logarithms are used, the formula becomes:

$$\log Y_D = \log A_0 + \alpha_1 \log K + \alpha_2 \log L = \lambda t$$

The symbol α_1 represents the elasticity of capital to output, α_2 the elasticity of labour to output, and A_0 the parameter of dimension.

Attention should be paid to the fact that the input of labour, L, is equal to the supply of labour minus disguised unemployment. In

1 As regards the concept of economic surplus, see Akira Ōnishi, "Economic Surplus and Economic Growth," *Mita Gakkai Zasshi*, Vol. 52, No. 9, pp. 12–29 (in Japanese).

2 Office Statistique des Communautés Européennes, "Les Méthodes de Prévision du Dévelopment Économiques à Long Terme," Nov.-Dec., 1960.

Asia's developing countries, this type of unemployment has great importance.[1] This neo-classical production function is originally a theory developed on the premise of "full employment"; it is, therefore, questionable whether it is applicable to Asian developing countries.[2] At any rate, it must be abandoned when the practical measurement of the unemployment ratio is difficult; in this case, the well-known Harrod-Domar's linear production function will be chosen as a first approach.

In our models, it is assumed that the gross domestic product in a t period is a linear function of capital stocks in a $t-1$ period, allowing thereby some time-lag for the period of production:

$$(1.3) \qquad Y_D{}^t = \theta K_{t-1}$$

Since this function includes stocks of capital in variables, the formula of stocks of capital must be introduced:

$$(1.4) \qquad K_t = K_0 + (1-\eta)(1-\varepsilon)\sum_{i=0}^{t} I_i$$

K_0 represents the outstanding amount of capital in a base year, and η the depreciation rate of capital, supposing a certain ratio of gross fixed capital formation. ε indicates the relation between total investments and inventory investments.

From (1.3) and (1.4), the formula of the production function in this model is obtained:

$$Y_D{}^t = \theta K_{-1} + \theta(1-\eta)(1-\varepsilon)\sum_{i=0}^{t-1} I_i$$

If $\theta K_{-1} \equiv \alpha$ and $\theta(1-\eta)(1-\varepsilon) \equiv \beta$, then

$$(1.5) \qquad Y_D{}^t = \alpha + \beta \sum_{i=0}^{t-1} I_i$$

α is the parameter of dimension, being equivalent to the initial value of gross domestic production $Y_D{}^0$, and β is the reciprocal of marginal gross capital co-efficient K. Therefore, (1.4) may also be represented as follows:

$$(1.5') \qquad K(Y_D{}^t - Y_D{}^0) = \sum_{i=0}^{t-1} I_i$$

It is the functional formula (1.5) that was actually adopted to the model. In this function β may almost be considered as the reciprocal of marginal gross capital coefficient, K. Therefore, taking changes in K into consideration and through the simulation method of forecasting

1 An example of this problem is found in: R. Nurkse, *Problems of Capital Formation in Underdeveloped Countries*, Oxford, B. Blackwell, 1953.

2 As regards the neo-classical production function, see: J.E. Mead, *A Neo-Classical Theory of Economic Growth*, London, George Allen and Unwin, 1961; J. Tinbergen & others, *Mathematical Models of Economic Growth*, New York, McGraw-Hill, 1962.

the balance of the national economy corresponding to changes in K, defects of the linear production function may corrected to some extent.

As regards the consumption function, consumption is divided into private and government consumption expenditures, and a linear function is presumed for each of them.

$$(1.6) \quad C_t = \alpha_c + \beta_c Y_t$$

$$(1.7) \quad G_t = \alpha_G + \beta_G Y_t$$

α_c and α_G are constant; β_c and β_G represent the marginal propensity to consume. For some Asian countries, a non-linear function was considered more adequate than a linear one. However, the matter was settled by a modification of the parameters.

Because of the necessary connection with the foreign trade matrix, the growth of exports and imports is given exogenously in Model 1. The rate of increase in exports and imports was calculated from the projected figures for 1970, estimated through utilization of the foreign trade matrix; the growth rates of exports and imports (γ_e and γ_m) were considered as exogenous variables of the model.

$$(1.8) \quad E_t = E_0(1+\gamma_e)^t$$

$$(1.9) \quad M_t = M_0(1+\gamma_m)^t$$

In Model 2, the growth process of exports alone is decided beforehand exogenously, whilst that of imports becomes endogenous. The following function with an explanatory variable of gross national product, Y, is supposed.

$$(2.0) \quad M_t = \alpha_m + \beta_m Y_t \quad \text{or}$$

$$(2.0') \quad \log M_t = \log \alpha_m + \beta_m \log Y_t$$

β_m is the elasticity of import demand to gross national product, $\left(\frac{\alpha M}{M} \Big/ \frac{\alpha Y}{Y}\right)$, and α_m is a constant figure.

Actual estimation was conducted by using (2.0) and (2.0′), but for some countries satisfactory results could not be obtained. While estimation by dividing the import function into capital goods, raw materials, consumer goods and services, revealed that relatively many countries have a high correlation of imports of capital goods and raw materials and the gross domestic product, imports of consumer goods and services showed mostly non-significant results from statistical inference. Consequently, the coefficient of elasticity of capital goods and raw materials import demand to income can be used to some extent as an indicator of the development stage of sectors substituting for imports. On the other hand, the coefficient of elasticity of consumer goods import demand to income does not seem to be so reliable.

From experience gained by our projections, it seems good to put deficits of the trade balance in the preceding year (B'_{t-1}) in explanatory variables of import function, and to determine an automatic control system for deficits of the trade balance or the expected amount of foreign aid, in order not to exceed a certain limit. In such a case, the above-mentioned formula of import function is represented as follows:

$$(2.1) \qquad M_t = \alpha_m + \beta_m Y_t + \rho B'_{t-1}$$

Here, ρ is some kind of control factor, and when ρ is zero, (2.1) is equivalent to the above-mentioned import function (2.0).

As regards the net factor income from abroad, the extrapolation of past trends was adopted:

$$(2.2) \qquad T_t = \lambda_0 + \lambda_t$$

Thus Model 1 and Model 2 can be summarized as follows:

Model 1

1. $Y_t = Y_{Dt} + T_t$
2. $Y_{Dt} = C_t + G_t + I_t + E_t + M_t$
3. $Y_{Dt} = \alpha + \beta \sum_{i=0}^{t-1} I_i$
4. $C_t = \alpha_c + \beta_c Y_t$
5. $G_t = \alpha_G + \beta_G Y_t$
6. $E_t = E_0(1+\gamma_e)^t$
7. $M_t = M_0(1+\gamma_m)^t$
8. $T_t = \lambda_0 + \lambda_t$

Where are given:
- Initial values and parameters: $I_0,\ Y_0,\ E_0,\ M_0,\ \alpha_1,\ \beta_1,\ \alpha_c,\ \beta_c,\ \alpha_G,\ \beta_G,\ \lambda_0,\ \lambda$
- Growth rate of exports and imports: $\gamma_e,\ \gamma_m$

and unknown:
- Exogenous variables: $E_t,\ M_t,\ T_t$
- Endogenous variables: $Y_t,\ Y_{Dt},\ C_t,\ G_t,\ I_t$

Model 2

1. $Y_t = Y_{Dt} + T_t$
2. $Y_{Dt} = C_t + G_t + I_t + E_t - M_t$
3. $Y_{Dt} = \alpha + \beta \sum_{i=0}^{t-1} I_i$
4. $C_t = \alpha_c + \beta_c Y_t$
5. $G_t = \alpha_G + \beta_G Y_t$
6. $M_t = \alpha_m + \beta_m Y_t + \rho(E_{t-1} - M_{t-1})$

7. $E_t = E_0(1+\gamma_e)^t$
8. $T_t = \lambda_0 + \lambda_t$

Where are given
- Initial values and parameters:
  $I_0,\ Y_0,\ E_0,\ M_0,\ \lambda_1,\ \beta_1,\ \lambda_c,\ \beta_c,\ \alpha_G,\ \beta_G,\ \alpha_m,\ \beta_m,\ \rho,\ \lambda_0,\ \lambda$
- Growth rate of exports:
  γ_e

and unknown
- Exogenous variables:
  $E_t,\ T_t$
- Endogenous variables:
  $Y_t,\ Y_{Dt},\ C_t,\ G_t,\ I_t,\ M_t$

Methods of Projection by Model

For the projections of the 1970 balance of the national economy by the use of the above-mentioned long-term economic projection models, the gross national product, Y_0, and the gross domestic capital formation, I_0, in the base year 1960, (strictly speaking, average actual results for 1959, 1960, and 1961), are taken as initial values. In Model 1, exports, imports, and the net factor income from abroad are exogenous variables; gross national product Y_t, private consumption C_t, government consumption expenditure G_t, gross domestic capital formation I_t, are endogenous variables. In Model 2, the growth process of exports and net factor income from abroad alone are exogenous and import endogenous variables. In this case, by changes in the parameters of the economy of each country, such as marginal gross capital coefficient, marginal propensity to consume, propensity to import, and through repeated re-computation, a possible rate of economic growth was estimated. In case of changes in the structural parameters besides the international comparison of coefficients, consideration was paid to whether scheduled coefficients in the development plan of each country were appropriate or not.

For the projection of the 1970 national economy, a forecast of the most feasible rate of economic growth corresponding to the estimated value of foreign trade was made. A certain range between maximum and minimum was prepared for the estimated value of the gross national product. The maximum is the optimistic prospect of the country achieving full realization of its development plan. The minimum is the conservative prospect based on the actual tendency of economic growth.

Generally speaking, when the marginal capital coefficient, k, increases, the growth rate of the gross national product tends to slow down, and that of investments shows an even sharper slowing-down.

On the contrary, there is a tendency that when the marginal capital coefficient decreases, the growth rate of investments is accelerated, and the gross national product expands. Furthermore, the higher the marginal propensity to consume, the lower the economic growth rate. The greater the possible deficits in the trade balance, i.e., the larger the capital inflow from overseas, the higher the upper limit of economic growth rate.

These trends can be clearly observed, looking at the results of projections for economic growth in each country through long-term economic projection models.

(2) Projections for Industrial Sectors

At the beginning of our work, the intention was to make a theoretical framework for the forecasting of the industrial structure of the countries within the area, through the use of dynamic sector models, adopting the method of input-output analysis. In fact, due to the lack of basic statistics, this approach was found too difficult. A Chenery model could be suggested for the patterns of industrial growth,[1] but there remain some doubts about its applicability to Asian countries. Chenery explains income in each industrial branch by using elasticity with respect to the per capita gross national product and to population. However, for the greater part of the countries within the area the gross national product per capita is mostly less than U.S. $100; therefore, the cross section analysis is not effective, and the time series analysis will give rise to serious problems of multicollinearity through the correlation between the explanatory variables. Consequently, significant parameters cannot be obtained.

Two methods were investigated as a first approach. One method prospected the 1970 income by industrial origin from the demand side by using correlation analysis of the value added in each industrial sector to gross national product. The other method projected the income by industrial origin from the production side by using production functions. It was found that results of forecasting prove little difference as long as linear functions are used; therefore, the first method, rather easier, was adopted.

The figures of sectoral incomes were computed by connecting the above-mentioned macro-economic models. Industries were divided into the following eleven sectors in accordance with the United Nations national income statistics, with, naturally, some exceptions. The sym-

1 H.B. Chenery, "Patterns of Industrial Growth," *American Economic Review*, Sept. 1960, pp. 634–635.

bols are:

Y_j : Income in j sector
Y_1 : Agriculture, forestry, and fishery
Y_2 : Mining
Y_3 : Manufacturing
Y_4 : Construction
Y_5 : Electricity, gas, and water
Y_6 : Transportation, storage, and communication
Y_7 : Wholesale and retail trade
Y_8 : Banking, insurance, and real estate
Y_9 : Ownership of dwellings
Y_{10} : Public administration and defence
Y_{11} : Services
Y_x : Gross or net domestic product at factor cost
Y_D : Gross domestic product at market prices

The estimated functional formula was:

$$(2.\ j) \qquad Y_j = a_j + b_j Y_x \quad (j=1,\ 2, \ldots\ldots 11)$$

on the condition that $\sum_{j=1}^{11} Y_j \equiv Y_x$, $\sum_{j=1}^{11} a_j \equiv 0$

$$(2.12) \qquad Y_x = a + bY_D$$

The equation (2. j) shows that the income in each sector Y_j is a linear function of net domestic product or gross domestic product at factor cost Y_x. The total of income of each sector, $\sum_{j=1}^{11} Y_j$, by definition must be equal to Y_x. The equation (2. 12) is a functional formula relating to the macro-economic models.

In the above-mentioned second method, which utilizes linear production functions, the explanatory variable in the formula (2. j) stands for the cumulative investments of each sector $\sum I_{ji}$ in place of Y_x; a functional formula indicating the distribution of investments to each sector is newly added. Namely, the above-mentioned production function of macro-economic model $Y_{Dt} = \alpha + \beta \sum_{i=0}^{t-1} I_i$ is replaced by the following 24 equations.

$$\sum_{i=0}^{t-1} I_{ji} = e_j + f_j \sum_{i=0}^{t-1} I_i \quad (j=1.\ldots\ldots 11)$$

$$Y_{jt} = a_j + b_j \sum_{i=0}^{t-1} I_{ji} \quad (j=1.\ldots\ldots 11)$$

$$Y_{xt} = \sum_{j=1}^{11} Y_{jt}$$

$$Y_{xt} = c + d\, Y_{Dt}$$

Through the above procedure, the composition of expenditures of gross domestic product and income by industrial origin in the year 1970 economy of each country was estimated. In order to check the estimated values with the results of projections for major commodities in the agricultural and manufacturing branches, the value added production index of the principal commodities in the respective branches was computed. By these production indices, some revisions of the parameters of income structural equations in the manufacturing and agricultural branches were made.

(3) Projections of Foreign Trade

As a separate article is in preparation, detailed explanations concerning projections of foreign trade will be omitted and only some main points will be stated.

For the estimation of the year 1970 export and import scales in countries within the area, a Beckerman model,[1] based on the matrix of world trade in 1960–61 is used. Four parts, North America, the United Kingdom, EEC and other European countries, are included in the exogenous sector, and twenty-four parts constitute the endogenous sector, including Japan and other countries in Asia. In case of the 1970 estimation of import scales in the exogenous sector, the annual average of growth rate of the gross national product is estimated at 3.7% for North America, 3.4% for the United Kingdom, and 4.8% for the EEC countries, and the elasticity of import demand to income is utilized.

Computing reversely from the projected 1970 value of exports and imports of Asian countries, the growth rate of exports and imports of each country in the 1960's is estimated. The figure thus obtained is included in the macro-economic projection model.

3. *Some Problems of Method*

Following the methods stated above, projections for the economic growth of Asian developing countries were made. It will be instructive to point out some problems of method.

a. Foreign Trade Forecasting and Aggregative Economic Projections

The aggregative economic projection model treats the growth rate of exports and imports as exogenous variables in order to relate them to the estimated value based on the foreign trade matrix. It remains relevant to relate imports to the level of economic activity in each

1. W. Beckerman, "World Trade Multiplier and the Stability of World Trade, 1938 to 1953," *Econometrica*, July 1956, pp. 239–252.

country within the area, and to formulate a model where the trade within the area is treated as an endogenous factor. This method is not particularly difficult in theory, as it is only the application of a dynamic input-output model analysis. The results of such computation were, however, not included in this report for lack of time.

b. Sectoral Projections

The forecasting by industrial branches by means of dynamic multi-sector models was programmed at the beginning of the research, but due to the lack of sufficient basic statistics on distribution of investments in industrial branches, etc., it was called off. Steady efforts are required for the improvement of operational projection models and the compilation of basic statistics.

c. Aggregative Economic Projections and Commodity Projections

The relation between aggregative economic projections and commodity projections requires consistency,[1] but on account of the limitations imposed by methods, it was difficult to maintain perfect consistency. In principle, the following iteration method was adopted: Indicators of the gross national product of each country, calculated from aggregative projection models, were used as an important explanatory variable of the principal commodity demand projections, such as agriculture, manufacturing, energy, etc. As a result, in cases where the balance of commodity demand and supply registered a marked excess in supply, the estimated value of the gross national product was revised at a lower level and possible rates of growth were computated repeatedly. As regards agriculture and manufacturing, the value added production index which was computed from the estimated value of the principal commodities supply, was related to the income index by industrial sector; the parameter of the income structure formula was then extrapolated after some revisions.

It must thus be remembered that the rate of economic growth in Asian developing countries, as proposed, is hampered by some methodological factors.

III. RESULT OF PROJECTIONS

It is instructive to compare the projections of the aggregate economy to the actual trend in the 1950's, and the target of development plan of each country in the 1960's. Three groups of countries may be

1 See: L. M. Goreux, "Economic Growth and Commodity Projections," *Monthly Bulletin of Agricultural Economics and Statistics*, July-August, 1961, pp. 1–17.

distinguished: 1) A group where in the 1960's an upward tendency is witnessed as opposed to the actual economic growth in the 1950's; this includes Thailand, Malaya, Pakistan, India. 2) A group of relatively stabilized-type countries where a comparatively high rate of growth continued from the 1950's is anticipated, such as China (Taiwan) and the Philippines. 3) A group of countries where a sidewise development or a slowing-down in growth rate is to some extent forecasted for the 1960's, such as Burma, Indonesia, Korea, etc. Naturally, the above distinction is not absolute, but only relative. The rate of economic growth of Burma and Korea, listed in the group of stagnant countries, is estimated to be rather high, compared with other countries within the area, registering about 4.0–5.0% for the former, and about 3.8–4.8% for the latter; but attention must be paid to the fact that the growth rate of these countries has tended to become stagnant in recent years. As regards Indonesia, the growth rate is estimated to continue a stagnant tendency in the 1960's but the possibility of potential growth is very large.

In India, classified under the group of growing-type economies, the annual average of the growth rate of gross national product in the 1960's is estimated at about 3.5–4.5%; for Pakistan the growth rate is estimated at about 3.7–4.7%; and for Malaya, about 3.9–4.9%. A growth rate estimated at over 5% is found only in Thailand, with the figure of about 5.3–5.9%. In China (Taiwan), classified under the group of economies of stabilized growth, the annual average of growth rate is expected to exceed 5%, registering about 6.0–7.0%; however, as the economic structure grows more similar to the advanced country type, a slow declining tendency may be anticipated. The economy of the Philippines is expected to maintain continued from the 1950's; a relatively high growth rate compared with other countries in the area, in the optimistic view, the growth rate is anticipated to be 5% per annum.

A comparison of the estimated value of economic growth in these countries in the 1960's with the target of development plans in each country reveals that countries where the target of planning is expected to be almost attained are Thailand (scheduled target 5%) and Malaya (4.4%), the rest of the countries being anticipated to show smaller development than scheduled. Countries where the target of planning is too high and is anticipated to be beyond reach are Burma (about 5.9–7.6%), Ceylon (about 6.0%), and the Republic of Korea (about 7.1 %). The targets of planning, about 8.0%, for China (Taiwan), about

5.0% for India, about 4.8–5.4% for Pakistan, about 6.1% for the Philippines, are considered to be difficult to attain without considerable efforts. For the realization of the target an increase of the savings rate through curtailment of the propensity to consume and mobilization of these savings into effective investments must be achieved, beyond our estimates; furthermore, the necessity of depending on economic and technical aid from abroad will increase.

Annual Growth Rate of Gross National Product in Developing Countries in Asia
(Actual results in the 1950's, planned figures in the 1960's and projected figures.)

(%)

Country	Actual Annual Rate of Growth in the 1950's	Planned Figures in the 1960's	Estimated Figures by Institute of Asian Economic Affairs			Rosenstein-Rodan		FAO	
			1960–70			1961–66	1966–71	1960–70	
			Max.	*Med.*	*Min.*			*High*	*Low*
Burma	5.1	5.9–7.6	5.0	4.5	4.0	4.0	5.0	5.0	4.0
Ceylon	3.4	6.0	3.9	3.5	3.1	3.0	4.0	4.5	3.5
China (Taiwan)	6.9	8.0	7.0	6.5	6.0	3.5	3,75	6.5	5.0
India	3.6	5.0	4.5	4.0	3.5	5.0	5.0	5.3	3.9
Indonesia	3.2	3.8	2.7	2.4	2.2	2.5	3.0	4.5	3.0
The Republic of Korea	4.9	7.1	4.8	4.3	3.8	3.0	3.5	5.0	4.0
Malaya	3.8	4.4	4.9	4.4	3.9	4.0	4.0	—	—
Pakistan	3.3	4.8–5.4	4.7	4.0	3.7	4.0	4.5	3.8	2.5
The Philippines	4.9	6.1	5.2	4.8	4.5	3.5	4.0	6.0	4.5
Thailand	5.2	5.0	5.9	5.6	5.3	3.0	3.5	5.0	4.0

Notes: 1. The observed period of the annual growth rate of gross national product in the 1950's is as follows: Burma, 1951–61, Ceylon, 1950–60; Formosa, 1952–60; India, 1950–60; Indonesia, 1953–59; the Republic of Korea, 1953–60; Pakistan, 1950–61; the Philippines, 1952–60; Thailand, 1952–61. The annual growth rate γy is estimated by fitting semi-logarithmic time trend, $\log y = a + t \log (1+\gamma y)$.

2. Planned figures in the 1960's are based on existing development plans of which the period is:

Burma	5.9% for 1961/62–1964/65, 7.6% for 1965/66–1968/69		
Ceylon	1957–68	China (Taiwan)	1957–68
India	1961–66	The Republic of Korea	1962–66
Malay	1960–65	Pakistan	4.8% for 1960–65, 5.4% for 1965–70
The Philippines	1963–67	Thailand	1961–66

3. Estimates by Rosenstein-Rodan, "International Aid for Underdeveloped Countries," *Review of Economics and Statistics*, May 1961, p. 120.
4. Estimates by FAO, *Agricultural Commodity Projections for 1970*, FAO, May 1962.

IV. CONCLUSION

The projections of the expenditure structures of the gross national product, and incomes by industrial origin of all the developing areas in Asia were not possible on account of limited data. However, ten countries, Burma, Ceylon, China (Taiwan), India, Indonesia, the Republic of Korea, Malaya, Pakistan, the Philippines and Thailand, which cover about 90% of the total developing area in Asia, are included in our investigation. Consequently, the general tendency of the developing Asian area can be determined.

According to these projections, the scale of the year 1970 gross national product of these ten countries is estimated to attain about $ 92,700 million at 1960 prices, government and private consumption expenditures about $ 80,100 million, gross capital formation about $ 15,400 million, exports of goods and services about $ 9,200 million, imports about $ 11,400 million, and the deficit in the trade balance about $ 2,200 million.

The annual average of growth rate in the ten countries in the 1960's is expected to be about 4.1% for gross national product, about 5.2% for investments, about 4.6% for exports and about 4.5% for imports. The average rate of economic growth in this area, about 4.1%, is lower than the target of 5% indicated in *Ten Years of Development of the United Nations;* but the growth rate is somewhat greater than the actual rate of about 3.9% in the latter half of the 1950's. In view of the fact that in the development plans of these countries an increase of about 5.3% is anticipated, our estimated value may be said to lie almost between the trend based on actual results of the past and the trend scheduled in the plan.

An average annual growth rate of the gross national product of about 4.1% is not especially low in the world economy as a whole. However, since the average annual rate of population increase in these areas exceeds 2%, the annual growth rate of income per capita is anticipated barely to maintain the level of 2%, and the rate of increase in consumption per capita is anticipated to decline below the level of 2%.

As regards gross national product per capita in U.S. dollars, countries which exceeded the level of $ 100 in 1960 were the Philippines, China (Taiwan), Ceylon and the Republic of Korea, whilst the level in Thailand, India, Pakistan, Burma, Indonesia was less than $ 100. Gross national product per capita in every country is expected to show an

upward tendency in the 1960's, but within the latter group Thailand alone would exceed the $ 100 mark, and India, Pakistan, Burma, Indonesia, etc. would remain at a level below $ 100. Moreover, reflecting the upward tendency of investment level per capita with the progress of economic development, the consumption level per capita tends to be behind the advancing tempo of income level per capita. Countries where private consumption per capita exceeded $ 100 in 1960 were Malaya and the Philippines, and those where the consumption barely maintained the level of $ 100 were the Republic of Korea and Ceylon. It is estimated that in 1970, China (Taiwan) will outstrip the Republic of Korea and Ceylon, and move near to the Philippines. However, the consumption per capita in Thailand, India, Pakistan, Burma and Indonesia is anticipated to remain at the level of less than $ 100.

This suggests that, as in the case of the 1950's, the decline in the relative position of developing Asian countries still continues in the 1960's, and the way to sustained economic growth is still thorny. G. Myrdal has pointed out that, under free working of the markets, the differences in economic growth between advanced and developing countries tend to become wider by the influence of circular and cumulative causation; he has stated that governments of developing countries should be required to cope with this tendency by establishing rational plans for development, so as to set the economy in the right direction of growth.[1] Setting aside the question of the theoretical grounds of this contention, our projections sustain the view that such a tendency will continue in the Asian developing areas in the 1960's.

1 G. Myrdal, *Economic Theory and Under-developed Regions*, London, G. Duckworth, 1957, p. 164.

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