

LONG-TERM PROJECTIONS FOR CEYLON, 1964-1973

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Part I deals with projections over ten years of exports and imports based on certain assumptions regarding growth in gross domestic product, population, terms of trade movement, etc. Part II considers the possibilities of import substitution in the agricultural sector with a view to bridging the trade gap. Part III analyses the implication of the assumptions made in Parts I and II on the domestic sector of the economy and the sectoral rates have been estimated. The final section deals with the investments required in the different sectors to achieve the growth rates derived in Part III.

I. THE TRADE GAP

Population: Population was assumed to grow at 2.7% for the period 1964-1967 and at 2.6% for the period 1968-1973.¹ These rates of growth are lower than the low estimates made by the Planning Secretariat,² as it is now thought that the latter projections have erred on the high side. The figures published by the Department of Census & Statistics over the past five years indicate a downward trend in the rate of growth. However, a growth rate of 2.7% was chosen as this was the compound growth rate in population over the five years 1959-1963. A change to a 2.6% growth rate was made from 1968 onwards due to the declining trend in the rate of growth exhibited in recent years. Using the 1963 population figure of 10.712 million, the population estimates for the period 1964-1973 were obtained.

Gross Domestic Product: Three different assumptions were made regarding the rate of growth of real gross domestic product. The first case considered was the rate of growth experienced during the 1950's, viz. 3.6%.³ This growth rate implies an increase in per capita income of only 0.9% for the period 1964-1967 and of 1% for the period 1968-1973. The second case considered was a 5% growth rate⁴ for the whole period, as this was the target rate

¹ The Institute of Asian Economic Affairs assumed a growth rate in population of 2.85% for Ceylon in their *Long-term Projections for the Developing Asian Countries, 1961-1970*, Tokyo, 1964.

² Planning Secretariat, *Population Projections for Ceylon, 1956-1981*, Ceylon, 1959.

Rates of growth (low)	1964-1966	1966-1971	1971-1973
	2.90	2.72	2.61

³ U. N., *Economic Bulletin of Asia and the Far East*, Vol. XIV, No. 3 (Dec., 1963), Bangkok, p. 36.

⁴ This means that per capita income will grow at 2.3% in the period 1964-1967 and at 2.4% in the period 1968-1973.

postulated for developing countries during the United Nations Development Decade. The last case was that of an accelerated growth rate reaching 6.5% in 1973.⁵

Exports: During the five-year period 1959-1963 the ratio of total domestic exports to g.d.p. was about 30%. Tea exports made up about 2/3 of this, while rubber, major coconut products and other domestic exports made up 17%, 12%, and 6% respectively of total domestic exports.

The export projections were made by considering separately each of our major export commodities, tea, rubber, and coconut. It was assumed that the production of tea will grow at 3% during the period 1964-1968 and at 4% during the period 1969-1973.⁶ On the average, 94.7% of the tea produced was exported during the period 1959-1963. This same proportion was applied to the projected tea production to estimate the tea exports for the period under study.⁷ Three estimates of the value of tea exports were made. First, using the 1963 f.o.b. price, second, using the average 1959-1963 f.o.b. prices⁸ and last, by valuing the quantities at current prices obtained by projecting the downward trend in f.o.b. tea prices during the period 1957-1963.⁹

Rubber production increased on the average by 2% annually during the period 1960-1963. This same growth rate was assumed for the full ten-year period.¹⁰ During the period 1959-1963 exports averaged 98% of total rubber production. This ratio was applied to the production estimates to obtain projections of the quantities of rubber exported.¹¹ These quantities were

⁵ The growth rates assumed for the individual years were as follows:

1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
5.0	5.0	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.5	6.5

⁶ Between 1953 and 1963, tea production grew at a compound rate of 4.1%. The increase in yields during this period was mainly due to increased fertilizer application. It is expected that yield increases due to this factor will level off. Hence the growth rate assumed was lower than that experienced in the past decade. A higher rate was assumed for the period 1969-1973 due to the acceleration of the replanting programmes.

The Institute of Asian Economic Affairs in the *Long-term Projections for the Developing Asian Countries, 1961-1970* assumed a rate of increase of 2.4% during the sixties.

⁷ During the last decade, tea exports grew at the compound rate of 2.9%. The use of a constant proportion in estimating tea exports implies that exports also grow at the same rate as production, viz., 3% from 1964-1968 and 4% from 1969-1973.

⁸ Since the export prices exhibited a declining trend during this period, the use of the average implies an improvement in export prices after 1963.

⁹ A longer period was not used for determining the trend because the price fluctuations caused by the Korean War boom and the 1954 boom upset the marked decline in prices shown in more recent years.

¹⁰ The Institute of Asian Economic Affairs in the *Long-term Projections for the Developing Asian Countries, 1961-1970* assumed a rate of increase in rubber production of 1.9% during the sixties.

¹¹ Unlike the case of tea, there has been no clear trend either in the production or in the exports of rubber. The projections assume an upward trend, viz., 2% annually, for rubber exports.

valued in three ways, as described above in the case of tea.

The quantities of coconut oil, copra, and desiccated coconut exported have shown no marked trends during the fifties, and as such it was assumed that the quantities exported remained constant at the 1959-1963 average for the full ten-year period. Similarly, the f.o.b. prices showed no marked trends and instead of using current prices as in the case of tea and rubber exports, the average 1959-1963 f.o.b. prices were used. Other domestic exports were assumed unchanged in value at the average for the period 1959-1963.

The projected export earnings from tea and rubber are probably on the high side. On the other hand, the estimates in respect of exports of coconut products are probably low and the use of a constant value for other export earnings is unrealistic in view of the policy measures aimed at export diversification. No other assumption was possible for the latter, due to the lack of any firm information regarding export possibilities.

Imports: Total imports have been subdivided into consumer goods, intermediate goods, investment goods, and unclassified imports. Consumer goods have been further subdivided into food and drink, textiles and other consumer goods. Each of the categories identified have been deflated by their respective import price indices (1958=100) to reduce the import values to real terms. In the case of consumer goods it was decided to peg the per capita figure of real imports for the period under study. The implication of this assumption is that with a growing population there would be an improvement in the standard of living as there would be increased supplies per adult equivalent available, particularly due to the expected increase in domestic production of consumer goods. It was necessary that this per capita figure be stabilized at a suitable level. 1959 and 1960 were record years for the import of consumer goods and imports in general, after which restrictions of increasing severity were brought into force. As such, it was decided to fix the per capita level of real imports of each of the categories of consumer goods identified at the 1959-1963 average. Using these per capita figures and the population projections, the imports of the different categories of consumer goods valued at 1958 prices were estimated for the ten-year period.

In the case of imports of investment goods, the rate of increase was derived using the assumptions of a constant marginal capital output ratio and a constant import content of investment.¹² Under these assumptions the rate of increase in imports in period $t+1$ is given by the formula $\Delta^2 Y_{t+2} / \Delta Y_{t+1}$,¹³ where $\Delta^2 Y$ and ΔY are the second and first differences respectively

¹² With industrialization, the import content of investment should increase rather than remain constant. The aggregate demand function relating to imports of capital goods to investment, as given on p. 26 of the *Economic Bulletin of Asia and the Far East* (Dec., 1963), shows that the percent increase in imports of capital goods is higher than the percent increase in investment.

¹³ $M_t = c I_t$, where M_t is the import of investment goods; I_t the investment in time period t ; and c the import content of investment. $I_t = K \Delta Y_{t+1}$, where K is the marginal

of the gross domestic product series. It was also assumed that imports of intermediate goods will increase at the same rate as imports of investment goods. The rates of increase for the three cases of growth considered are given in Table I and these rates of growth have been applied to the 1963 import levels of investment and intermediate goods,¹⁴ deflated by their respective price indices.

It is seen that in the case of a constant rate of growth in g.d.p., the rates of increase in imports of investment and intermediate goods are equal to that of g.d.p., while in the case of an accelerated rate of growth, imports of investment and intermediate goods increase at a faster rate than g.d.p. It follows that investment as a ratio of g.d.p. remains constant at the base year ratio of 15.5% in the case of a constant growth rate, while it rises¹⁵ in the case of accelerated growth from 15.5% in 1963 to 20.4% in 1972.

Unclassified imports have also been treated like imports of consumer goods. The total of all these categories gave the import requirements at 1958 import prices, for the three cases of growth in g.d.p. considered.

As in the case of exports, imports have been valued using three different price assumptions. First, to obtain estimates at 1963 import prices, the component import items were multiplied by their 1963 price indices. Next, the component items were multiplied by the average 1959–1963 price indices. Last, the 1948–1963 trend in import prices was projected for the ten-year period and the estimates of the component import items at 1958 prices were multiplied by the projected price indices to give estimates at current prices.

The projections of imports and exports and the trade balance for the three cases of growth in real g.d.p. and the three price assumptions are given for each of the years 1964–1973 in Tables 3, 4, and 5. An examination of these Tables shows that the most favourable prices for Ceylon are the average 1959–1963 prices, while the prices obtained by projecting the long-term trend are the least favourable. As mentioned earlier, the use of the average 1959–1963 prices implies an improvement in the terms of trade after 1963,

capital output ratio and $\Delta Y_{t+1} = Y_{t+1} - Y_t$. This assumes a one-year lag in the investment-income relation.

$$\therefore \frac{\Delta M_{t+1}}{M_t} = \frac{\Delta I_{t+1}}{I_t} = \frac{\Delta^2 Y_{t+2}}{\Delta Y_{t+1}}$$

¹⁴ The use of the growth rates (as given in Table 1) on the base year figure of imports carries the implicit assumption that investment in 1963 is sufficient to increase g.d.p. in 1964 by the amount assumed in the study. This assumption implies a certain value for the capital output ratio, at which value the ratio should remain for the full ten-year period for the result derived in footnote 13 to hold good.

¹⁵ $\frac{I_{t+1}}{Y_{t+1}} = \frac{I_t + \Delta I_{t+1}}{Y_t + \Delta Y_{t+1}} = \frac{I_t}{Y_t} \left\{ 1 + \frac{\Delta I_{t+1}}{I_t} - \frac{\Delta Y_{t+1}}{Y_t} \right\} = \frac{I_t}{Y_t} \left\{ 1 + \frac{\Delta^2 Y_{t+2}}{Y_{t+1}} - \frac{\Delta Y_{t+1}}{Y_t} \right\}$

This result and that derived in footnote 13 are dependent on the assumption regarding the marginal capital output ratio and the import content of investment. These constants have been implicitly assumed in this study. However, different rates of growth of the various sectors of the economy, resulting in different investment requirements, will invalidate the assumptions regarding constancy.

while the use of prices obtained by projecting the long-term trend implies a further deterioration in the terms of trade after 1963.

No attempt has been made to project the invisible items in the current account of the balance of payments. It is expected that servicing foreign debt will be a substantial burden in future years and to this extent, an estimate of the deficit on current account based on the trade gap will be understated.

The possibilities of import substitution have not been considered so far. In the absence of such an analysis, Table 2 gives the percentage of imports that would have to be financed by external assistance and the reduction of foreign assets, for the three cases of growth considered. Comparative figures are given for the period 1957-1962. Table 2 gives the ratios corresponding to the trade gap when imports and exports are valued at current prices, as this is the case least favourable from Ceylon's point of view.

II. IMPORT SUBSTITUTION IN THE AGRICULTURAL SECTOR AND IN FISHERIES

In the methodology followed in Part I, the imports of food and drink were treated in an aggregative manner. Such treatment is inadequate when considering the possibilities of import substitution as it is necessary to judge the production possibilities of each of the commodities separately. This would necessarily introduce errors into the estimates but it is not possible, a priori, to assess the magnitude or direction of these errors. Only import substitution in the agricultural sector and in fisheries have been considered and the commodities analysed were rice, flour, sugar, chillies, potatoes, onions, green gram and dhall, fish, eggs, milk and milk foods, and meat and meat preparations. The imports of these food items accounted for 85-90% of the food import bill during the five years 1959-1963.

Only the cases of 5% growth and accelerated growth were considered in this section as the main purpose of the exercise was to determine the implications of a growth rate higher than that achieved in the past. The general method used in estimating the extent of import substitution in respect of each of the commodities considered was as follows. The per capita income figures for the years 1964-1973 were estimated using growth rates derived from those of g.d.p. and of population. Domestic consumption of the various commodities for the past years were estimated by adding the import figures as given in the *Ceylon Customs Returns* to the local production figures published in the *Statistical Abstract of Ceylon* of the Department of Census and Statistics. It was not possible to make any allowance for stock changes except in the case of rice for which figures were obtained from the Food Commissioner's Department. Annual increments in per capita consumption¹⁶ were then determined using the projected per capita incomes, the 1963 per capita con-

¹⁶ $(\delta c/c) / (\delta y/y) = E$, where c = per capita consumption, y = per capita income, E = income elasticity of demand.

$$\therefore \delta c = E \cdot (\delta y/y) \cdot c.$$

sumption and the income elasticities of demand where available.¹⁷ In the case of sugar, flour, onions, potatoes, chillies, green gram and dhall and dried fish no estimates of income elasticities were available, and hence it was assumed that the per capita consumption level remained constant at the average for the period 1959-1963. This involved the implicit assumption of zero income elasticity of demand. Total consumption was determined by multiplying the per capita consumption estimates by population.

Local production was estimated using different assumptions for each commodity. In the case of rice, a 6.1%¹⁸ growth rate, consistent with past trends, was assumed for the ten-year period. Self-sufficiency in chillies, onions, and green gram by 1973 was assumed with production growing at a compound rate from 1962 to the projected consumption in 1973. In the case of potatoes, sugar, and dhall it was assumed that by 1973 Ceylon will be producing 50% of the estimated consumption requirements, with production growing by equal annual increments to this level. For dairy products it was assumed that local production will meet the full consumption requirements of eggs and meat and meat preparations during the period under study while in the case of butter, local production will only meet increases in consumption above the 1963 level. In the case of condensed milk, it was assumed that full capacity production (=2/3 present consumption) of the proposed factory will commence in 1966. It was also assumed that no imports of fresh fish and tinned fish will be made during the ten-year period while in the case of dried fish self-sufficiency was assumed by 1973 with production increasing by equal annual increments to the projected consumption in 1973.

The imports necessary for each of the commodities were then determined as a residual. In the import projections made in Part I, provision was made for a constant per capita level of imports. In most cases due to increases in local production assumed, this import level is not required. The savings in import quantities were valued at the average 1959-1963 prices to give estimates of foreign exchange savings due to import substitution in respect of each of the commodities considered. To convert these estimates to 1963 prices and current prices, the saving each year was multiplied by the corresponding index of the food and drink component in the import price index (1959-1963=100). Details of the foreign exchange savings are given in Tables 6 and 7 for the two cases of growth considered.

The Residual Gap: The residual trade gap that has to be bridged for the two cases of growth are given in Tables 8 and 9. In the case of accelerated growth it is seen that the residual gap increases for all three terms of trade

¹⁷ The income elasticities used were as follows: Rice 0.59, Milk and Milk products 1.15, Eggs 1.40, Meat and Meat preparations 1.09, Fish 0.61. N. M. Kappagoda & A. G.A.D. Perera, "A Family Budget Study for Ceylon" in *Central Bank of Ceylon, Bulletin of July '64*, Colombo, Central Bank of Ceylon.

¹⁸ The Institute of Asian Economic Affairs in the *Long-term Projections for the Developing Asian Countries, 1961-1970* assumed a growth rate of 6.2%.

assumptions, while in the case of uniform 5% growth the gap diminishes and vanishes under favourable terms of trade assumptions.

The average annual deficits for the years 1964-1968 and 1969-1973 at current prices (as this case is least favourable to Ceylon) and the percentage these deficits form of total imports and gross domestic product for the same periods are given in Table 10. It would be of interest in this connexion to mention that in 1960 foreign assistance to the ECAFE region was 21.7% of total imports into the region.¹⁹

Before considering the possibilities of obtaining foreign assistance it would be useful at this stage to discuss the shortcomings and limitations of the above analysis. First, the possibilities of import substitution were considered only in respect of fish and agricultural products, the imports of which averaged between 85% and 90% of the total food import bill²⁰ during the five years 1959-1963. Foreign exchange savings would also be possible in the case of textiles and other consumer goods, but were not considered due to the lack of adequate data. In the agricultural sector, the production possibilities assumed were consistent with past trends and the desirability of achieving self-sufficiency. The targets assumed were not ambitious when compared to those of the Ten Year Plan, but what was obviously lacking here was a consideration of the feasibility of the targets assumed. Second, in projecting the import requirements of investment goods and raw materials, it was assumed that the import content of investment and the marginal capital output ratio were constant. In the ECAFE projections, the function relating the import of investment goods to investment was $N = -39 + 0.72 I$ from which it could be deduced that the rate of increase in the import of investment goods in that study was greater than that assumed in the present analysis. Thus our projections of these imports were probably low. Third, no allowance was made for export diversification although it is the policy of the government to reduce our reliance on the three main export commodities. It is however doubtful whether this would contribute in any significant way to a reduction of the trade gap in the near future. Last, no account was taken of the servicing of foreign debt, which would be formidable if Ceylon were to receive greater foreign assistance in the future.

The first and third factors mentioned above will operate to reduce the trade gap while the second and last factors have probably resulted in an underestimation of the gap. Thus the estimates given in Tables 8 and 9 have to be examined with these qualifications in mind as it is not possible, a priori, to make any allowance for these effects. Between 1950 and 1962, foreign loans and grants amounted to 663.8 million Rupees making an annual average of about 55 million Rupees. This amount is small when compared to the trade deficits that would arise if Ceylon was to pursue the growth rates postulated in this study, particularly, if the present trend in world prices

¹⁹ U. N., *Economic Survey of Asia and the Far East 1963*, p. 12.

²⁰ Food imports averaged 74% of total consumer goods imports and 39% of total imports during the period 1959-1963.

were to continue. Unlike during the 1950's, it would not be possible to rely on our foreign exchange reserves. Thus it appears that we would have to be satisfied with slower rates of growth than have been assumed in this study, unless, first, we receive foreign assistance²¹ on a much larger scale than in the past and second, the country is able to develop fast enough industrially for us to diversify our exports. Any programme of industrialization, however, would require sufficient foreign exchange during the initial years to finance the imports of investment goods. Thus we are faced with the vicious circle of slower growth contributing to lower export earnings which in turn leads to less ambitious investment programmes resulting in a lower rate of growth. Given the present structure of our foreign trade it is possible that the terms of trade would move in our favour from time to time, but it is hardly likely that this would give any prolonged relief to our foreign exchange problem. Thus it is clear that foreign assistance on a large scale is necessary for Ceylon in the immediate future, if her development programmes are not to be still-born.

Given the limitations of this type of analysis, the estimates of the trade gap are useful only to illustrate the magnitude of the problem Ceylon faces and not to work out the exact amounts of foreign assistance required. It is now necessary to work out the implications of the assumptions made on the domestic sector of the economy and test the over-all consistency of the whole exercise.

III. SECTORAL GROWTH RATES

The assumptions made in Parts I and II have been used to estimate the sectoral growth rates. The economy has been divided into four sectors. They are exports, fisheries and agriculture for domestic use, services and manufacturing and construction. The export sector corresponds to item I of the Table II-A2 of the *Annual Report*.²² Agriculture for domestic use and fisheries is item II-1 of the same table. The services sector consists of transport and communications, trade, ownership of dwellings, government n.i.e. and services n.i.e., while the manufacturing and construction sector consists of industry and capital development as given in the same table. It must be noted that this categorization underestimates the output of the services sector as certain financial services and trade and transport services in the distribution of local raw materials have not been deducted from the net output of the other sectors and added on to the services sector. Any adjustment for this would have been necessarily arbitrary and was not attempted here.

²¹ During the period 1957-1962, foreign assistance amounted to 27.5% and 30.8% of imports in the case of India and Pakistan respectively. These proportions are higher than those estimated for Ceylon in this study. However, imports form a lower proportion of g.d.p. in India and Pakistan than in Ceylon.

²² The classification follows that of *Central Bank of Ceylon, Annual Report, Colombo, The Monetary Board, 1962, p. 24.*

Using the assumptions made in Part I, it is found that the growth in exports²³ for the periods 1964-1968 and 1969-1973 are 2.9% and 3.0% respectively, compared to the actual growth rate of 2.8% realized for the period 1959-1963.

In the case of agricultural production for domestic use, rice production was assumed to grow at a rate of 6.1%²⁴ and valued at 12 Rupees per bushel, which is the guaranteed purchase price for paddy. The assumptions presently in use regarding the per capita domestic consumption of coconut and coconut products²⁵ were used and multiplied by the population estimates for each of the years. The local consumption of tea was obtained as a residual and valued at the 1959 producer's value. In the case of other food crops including vegetables and fruit, production was assumed to grow at the same rate as population as is the present practice in constructing g.n.p. estimates. Highland food crops on the other hand were assumed to grow at a rate one per cent higher than the population growth rate. The higher growth rate assumed in this case was because of the ambitious assumptions made in Part II in respect of some subsidiary food crops.²⁶ Tobacco, betel, areca-nuts, firewood, and livestock were also assumed to grow at the population rate due to the lack of any alternative data. Miscellaneous agriculture which had previously been assumed to be 4% of other domestic agriculture was assumed to be a percentage which increased by equal increments from 4% in 1963 to 5% in 1973.

It was assumed in Part II that Ceylon would be self-sufficient in the case of fish by 1973 with production increasing from a wet fish equivalent of 1.81 million cwts. in 1963 to 4.75 million cwts. in 1973. It had also been assumed that production will increase by equal increments to the target figure in 1973 and this same assumption was used here.

From these assumptions, it can be seen that fisheries and agricultural production for domestic use increase at the rate of 4.7% during the period 1964-1973, compared to the growth rate of 5.3% realized during the period 1960-1963. The higher growth rate during the earlier period is due to the fact that rice production grew by a little over 9% per annum compared to 6.1% assumed for the period 1964-1973.²⁷ It is clear from the above analysis that the production of rice, tea for domestic use, fish, and highland food crops are given exogenously in the present model while the production of coconut for domestic use, vegetables and fruit, tobacco, betel, areca-nut, firewood, livestock and miscellaneous agriculture could be subject to policy decisions or determined within the model. However, production statistics for

²³ Valued at 1959 prices.

²⁴ See page 144.

²⁵ 6 nuts per person and 0.47 bottles of coconut oil per person per month.

²⁶ Self-sufficiency by 1973 in the case of chillies, onions, and green gram and the production of 50% of our requirements by 1973 in the case of sugar, potatoes, and dhall were assumed in Part II.

²⁷ Rice production accounts for 1/3 of domestic agriculture.

these items are very bad and nothing more than the population assumption was possible.

Between 1959-1963, the services sector grew at 1.7% which is much lower than either the growth rate in gross domestic product for the same period (3.1%) or the population growth rate (2.8%). This low growth rate is not surprising when we consider the methods of estimation of the constituent items in this sector. The trade and transport item which accounts for about half the product of this sector is dependent on imports and since the latter have been falling over the last few years the output of the services sector has fallen correspondingly.

It was thought appropriate that the services sector should grow at the rate assumed for the growth in g.d.p. Thus in the case of a 5% growth in g.d.p. for the period 1964-1973, the services sector too was assumed to grow at this rate. In the second case where an accelerated growth programme beginning with 5% in 1964 and ending with 6.5% in 1973 was assumed, the services sector will grow on the average at 5.2% during the period 1964-1968 and at 6.1% during the period 1969-1973.

Thus the manufacturing and construction sector is left as a residual in this model. For the period 1960-1963, this sector grew at the very modest rate of 4.3%. The industrial sector within this larger sector developed at a much faster rate but it accounted for only 35-40% of the net output of the manufacturing and construction sector. The assumption of 5% growth in g.d.p. for the ten-year period yields a growth rate of 8.8% for the period 1964-1968 and a growth rate of 7.9% for the period 1969-1973 for this sector, while the assumption of accelerated growth in g.d.p. yields a growth rate of 9.5% for the former period and 11.4% for the latter. These alternative growth rates for the manufacturing and construction sector do not appear unreasonable when compared to the growth rates of 9.1% and 9.0% for India and Pakistan respectively during their Third Five-Year Plans, particularly since Ceylon has a smaller industrial base. The projected sectoral growth rates for Ceylon are given in Table 11.

If the growth of the services sector necessary for the development of the economy is lower than the rates assumed above, then for consistency the manufacturing and construction sector will need to develop at a faster rate, provided the necessary adjustments are made in the other sectors of the economy. If this were possible, the faster growth of the industrial sector would enable the greater substitution of local products for imported manufactured consumer goods and also make it possible for Ceylon to diversify her export products. Both these factors will contribute to a reduction of the large trade gap. Even if the services sector does grow at a rate broadly equal to that of g.d.p., a faster growth of the industrial sector, given the necessary adjustments in the other sectors would not only have a favourable balance of payments effect, but would also enable Ceylon to develop at a faster rate.

IV. INVESTMENT REQUIREMENTS

The investment required to achieve the sectoral growth rates derived in Part III are estimated in this section. For this purpose the sectoral capital output ratios derived from the Ten Year Plan²⁸ were used with one modification. The method used in Part I for projecting the imports of investment goods carried an implicit assumption regarding the magnitude of the over-all capital output ratio, viz., that investment in the year 1963 was sufficient to achieve a growth rate of 5 percent in g.d.p. in 1964. This implicit ratio of 3.1:1 and the other sectoral capital output ratios as given in the Plan were used to derive the ratio for the manufacturing and construction sector using the increases in net output between 1964 and 1965 as weights. The capital output ratio thus derived for this sector was 3.5:1. The other sectoral ratios used were as follows:

Tea	1.25
Rubber	1.47
Coconut	1.35
Other Domestic-Agriculture	1.62
Fisheries	1.49
Services	4.28

The over-all figure for the services sector was derived by weighting the component ratios (of transport and communications, public administration, housing, and other services) by their respective outputs in 1963 valued at 1959 prices.

The estimated investment requirements of the manufacturing sector are probably low compared to Ceylon's past experience. However, it should be remembered that some of the past investments would mature during the next 10 years while the greater utilization of existing capacity would add to the output of the industrial sector.

The total investment in fisheries under the assumptions made in this study is about 210 million Rupees for the full ten-year period which is low compared to the investment of 1,500 million Rupees proposed by the Fisheries Corporation over the next 10 years.

Investments have different gestation periods but in this analysis only a lag of one year was introduced in respect of all types of investment. No refinements were attempted. Further, it is possible that the over-all capital output ratio of 3.1:1 is low, but information necessary for estimating these ratios in the different sectors of the economy were not available, and as such, it was decided not to increase the value of the over-all ratio. It would be of interest to mention that the over-all capital output ratio for the Indian economy derived from their Third Five-Year Plan was only 2.2:1.

The estimates of gross domestic savings given in Tables 12 and 13 have been derived using the ex post identity $S=I+X-M$ where 'S' is gross do-

²⁸ National Planning Council, Government of Ceylon, *The Ten Year Plan*, Colombo, 1959, p. 81.

mestic saving, 'I' investment, 'X' exports and 'M' imports. The trade gap has been used as an estimate of $X-M$ as it was decided in Part I to ignore the invisible items in the Balance of Payments current account.

The ratio of investment to g.d.p. remains approximately equal to that of the base year figure of 15.5 percent in the case of 5 percent growth in g.d.p. Similarly, the import content of investment is around that of the base year figure of 30.9 percent. The consumption ratio rises over the ten-year period from 86.4 percent to 89.0 percent. This decline in the domestic savings ratio is not an indication of what would necessarily happen if this growth pattern was followed. As mentioned in Part II a reduction of the trade gap either by export diversification or further import substitution would result in raising the savings ratio over the years.

In the case of accelerated growth in g.d.p., the investment ratio rises from 15.5 percent to 21.4 percent in 1972 while import content of investment falls slightly to 29.0 percent, in 1972.²⁹ The greater rise in the investment ratio than that expected from the analysis made in Part I (and hence the lowering of the import content of investment) is due to the fact that different sectoral growth rates in this case have resulted in raising the over-all capital output ratio to 3.27:1 in 1972. Here again, it is seen that the consumption ratio rises but as argued in the previous paragraph a reduction of the trade gap would enable a greater proportion of investment to be financed by domestic savings.

²⁹ Theoretically the ratio should be only 20.4% in 1972.

Table 1. RATES OF GROWTH OF IMPORTS OF INVESTMENT AND INTERMEDIATE GOODS

	Accelerated growth	5% growth	3.6% growth
1964	5.00	5.00	3.60
1965	7.10	5.00	3.60
1966	9.22	5.00	3.60
1967	9.27	5.00	3.60
1968	9.34	5.00	3.60
1969	9.41	5.00	3.60
1970	9.49	5.00	3.60
1971	9.58	5.00	3.60
1972	9.67	5.00	3.60
1973	6.50	5.00	3.60

Table 2. PERCENTAGE OF IMPORTS FINANCED BY CAPITAL INFLOWS AND REDUCTION OF FOREIGN ASSETS

	Capital inflows	Reduction of Foreign assets
1957-1962	1.0	6.4
	7.4	
1964-1968 (a)		14.3
(b)		15.6
(c)		17.7
1969-1973 (a)		22.9
(b)		26.4
(c)		34.8

Notes: 1. (a) 3.6% growth (b) 5% growth (c) Accelerated growth
 2. The figures for 1957-1962 are from U. N., *Economic Survey of Asia and the Far East 1963*, p. 12.

Table 3. PROJECTIONS FOR (1964-1973) 3.6% GROWTH IN G. D. P.
 (million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(a) <i>At 1963 Prices</i>										
Imports	1,933	1,991	2,051	2,113	2,175	2,239	2,305	2,373	2,443	2,515
Exports	1,777	1,818	1,860	1,911	1,975	2,035	2,098	2,163	2,230	2,300
Trade Balance	-156	-173	-191	-202	-200	-204	-207	-210	-213	-215
(b) <i>At 1959-1963 Average Prices</i>										
Imports	1,905	1,963	2,023	2,084	2,146	2,209	2,275	2,343	2,413	2,485
Exports	1,874	1,918	1,962	2,014	2,082	2,146	2,212	2,280	2,351	2,425
Trade Balance	-31	-45	-61	-70	-64	-63	-63	-63	-62	-60
(c) <i>At Current Prices</i>										
Imports	1,973	2,039	2,106	2,176	2,247	2,321	2,396	2,475	2,557	2,641
Exports	1,778	1,787	1,798	1,815	1,845	1,864	1,889	1,907	1,927	1,947
Trade Balance	-195	-252	-308	-361	-402	-454	-507	-568	-630	-694

Table 4. PROJECTIONS FOR (1964-1973) 5% GROWTH IN G. D. P.
 (million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(a) <i>At 1963 Prices</i>										
Imports	1,942	2,010	2,080	2,153	2,227	2,304	2,384	2,467	2,554	2,643
Exports	1,777	1,818	1,860	1,911	1,975	2,035	2,098	2,163	2,230	2,300
Trade Balance	-165	-192	-220	-242	-252	-269	-286	-304	-324	-343
(b) <i>At 1959-1963 Average Prices</i>										
Imports	1,915	1,983	2,058	2,126	2,201	2,279	2,359	2,443	2,530	2,621
Exports	1,874	1,918	1,962	2,014	2,082	2,146	2,212	2,280	2,351	2,425
Trade Gap	-41	-65	-91	-112	-119	-133	-147	-163	-179	-196
(c) <i>At Current Prices</i>										
Imports	1,983	2,060	2,139	2,223	2,309	2,399	2,493	2,592	2,694	2,802
Exports	1,778	1,787	1,798	1,815	1,845	1,867	1,889	1,907	1,927	1,947
Trade Gap	-205	-273	-341	-408	-464	-532	-604	-685	-767	-855

**Table 5. PROJECTIONS FOR (1964-1973) ACCELERATED GROWTH
IN G. D. P. TO 6.5% IN 1973** (million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(a) <i>At 1963 Prices</i>										
Imports	1,942	2,023	2,124	2,232	2,347	2,470	2,604	2,749	2,905	3,033
Exports	1,777	1,818	1,860	1,911	1,975	2,035	2,098	2,163	2,230	2,300
Trade Balance	-165	-205	-264	-321	-372	-435	-506	-586	-675	-733
(b) <i>At 1959-1963 Average Prices</i>										
Imports	1,915	1,997	2,100	2,211	2,328	2,456	2,593	2,743	2,905	3,035
Exports	1,874	1,918	1,962	2,014	2,082	2,146	2,212	2,280	2,351	2,425
Trade Gap	-41	-120	-138	-197	-246	-310	-381	-463	-554	-610
(c) <i>At Current Prices</i>										
Imports	1,983	2,076	2,191	2,316	2,452	2,600	2,761	2,938	3,132	3,291
Exports	1,778	1,787	1,798	1,815	1,845	1,867	1,889	1,907	1,927	1,947
Trade Gap	-205	-289	-393	-501	-607	-733	-872	-1,031	-1,205	-1,344

Table 6. FOREIGN EXCHANGE SAVING-5% GROWTH (million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Rice	33.2	37.7	42.7	48.7	54.3	61.1	68.5	76.7	85.7	95.7
Other food crops	12.8	24.3	36.4	49.2	63.0	77.6	93.7	110.7	129.5	149.7
Dairy products	6.7	6.3	17.0	16.6	16.2	15.7	15.2	14.7	14.1	13.4
Fish	15.6	23.5	30.0	39.3	47.3	55.2	63.1	71.1	79.1	87.0
Total										
(a) <i>At 1959-1963 prices</i>	68.3	91.8	126.1	153.3	180.8	209.6	240.5	273.2	308.4	345.8
(b) <i>At 1963 prices</i>	72.3	97.2	133.5	162.3	191.5	222.0	254.7	289.3	326.6	366.2
(c) <i>At current prices</i>	69.5	93.1	127.2	153.9	180.8	208.6	238.1	269.4	302.5	337.5

Table 7. FOREIGN EXCHANGE SAVING-ACCELERATED GROWTH

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Rice	33.2	37.7	42.3	46.7	50.8	54.6	57.9	60.8	63.1	64.7
Other food crops	12.8	24.3	36.4	49.2	63.0	77.6	93.7	110.7	129.5	149.7
Dairy products	6.7	6.3	17.0	16.6	16.1	15.4	14.7	13.8	12.7	11.5
Fish	15.6	23.5	30.0	39.3	47.3	55.2	63.1	71.1	79.1	87.0
Total										
(a) <i>At 1959-1963 prices</i>	68.3	91.8	125.7	151.8	177.2	202.8	229.4	256.4	284.4	312.9
(b) <i>At 1963 prices</i>	72.3	97.2	133.1	160.8	187.7	214.8	242.9	271.5	301.2	331.4
(c) <i>At current prices</i>	69.5	93.1	126.8	152.4	177.2	201.8	227.1	252.8	278.0	305.4

Table 8. TRADE BALANCE-5 PER CENT GROWTH
(Unit: million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(a) <i>At 1963 Prices</i>										
(i) Balance before Substitution	-165	-192	-220	-242	-252	-269	-286	-304	-324	-343
(ii) Balance after Substitution	-93	-95	-86	-80	-60	-47	-31	-15	3	23
(b) <i>At 1959-63 Average Prices</i>										
(i) Balance before Substitution	-41	-65	-91	-112	-119	-133	-147	-163	-179	-196
(ii) Balance after Substitution	27	27	35	41	62	73	94	110	129	150
(c) <i>At Current Prices</i>										
(i) Balance before Substitution	-205	-273	-341	-408	-464	-532	-604	-685	-767	-855
(ii) Balance after Substitution	-135	-180	-214	-254	-283	-323	-366	-416	-464	-517

Table 9. TRADE BALANCE-ACCELERATED GROWTH
(Unit: million Rupees)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(a) <i>At 1963 Prices</i>										
(i) Balance before Substitution	-165	-205	-264	-321	-372	-435	-506	-586	-675	-733
(ii) Balance after Substitution	-93	-108	-131	-160	-184	-220	-263	-314	-374	-402
(b) <i>At 1959-63 Average Prices</i>										
(i) Balance before Substitution	-41	-120	-138	-197	-246	-310	-381	-463	-554	-610
(ii) Balance after Substitution	27	28	12	45	69	107	152	207	270	297
(c) <i>At Current Prices</i>										
(i) Balance before Substitution	-205	-289	-393	-501	-607	-733	-872	-1,031	-1,205	-1,344
(ii) Balance after Substitution	-135	-196	-266	-349	-430	-531	-645	-778	-927	-1,039

Table 10.

	1964-1968	1969-1973
5% growth		
Trade gap (million Rupees)	213.2	417.2
Trade gap/Imports (%)	9.9	16.0
Trade gap/GDP (%)	2.7	4.2
Accelerated growth		
Trade gap (million Rupees)	275.2	784.0
Trade gap/Imports (%)	12.2	26.3
Trade gap/GDP (%)	3.5	7.6

Table 11.

		(million Rupees)			
		1959	1963	1968	1973
Gross Domestic Product	(a)	5,894	6,663	8,504	10,854
	(b)	5,894	6,663	8,477	11,533
(1) Exports		1,462	1,635	1,886	2,185
(2) Agriculture for domestic use		1,282	1,576	1,987	2,497
(3) Manufacturing and Construction	(a)	764	905	1,380	2,021
	(b)	764	905	1,425	2,440
(4) Services	(a)	2,386	2,548	3,252	4,151
	(b)	2,386	2,548	3,280	4,410

Percentage increase

		1959-1963	1964-1968	1969-1973	1964-1973
Gross Domestic Product	(a)	3.1	5.0	5.0	5.0
	(b)	3.1	5.2	6.1	5.6
(1) Exports		2.8	2.9	3.0	2.9
(2) Agriculture for domestic use		5.3	4.7	4.7	4.7
(3) Manufacturing and Construction	(a)	4.3	8.8	7.9	8.4
	(b)	4.3	9.5	11.4	10.4
(4) Services	(a)	1.7	5.0	5.0	5.0
	(b)	1.7	5.2	6.1	5.6

- Notes: 1. (a) 5 percent growth in g.d.p.
 (b) Accelerated growth in g.d.p.
 2. The estimates are at 1959 prices.

