The Possibilities of the East Pakistan Economy During the Fourth Five-Year Plan

by

AZIZUR RAHMAN KHAN*

1. INTRODUCTION

1.1 The Objective

The purpose of the present set of exercises is to study the possibilities of the East Pakistan economy during the fourth five-year plan period (1970-75) with the help of an explicit model. The model we employ is a multisectoral one of the simple consistency type. It is a *multisectoral* or *detailed* model for planning in the sense that it distinguishes as many as twenty-nine producing sectors of the economy of East Pakistan and explicitly takes into account all intersectoral deliveries of current and capital goods. The definite advantages of a multisectoral model over its alternative, a highly aggregated model, need hardly be pointed out. Since sectors with widely varying resource-requirements can easily have widely divergent rates of growth, the use of fixed overall incremental capital and foreign-exchange coefficients can hardly be a reliable method of estimating the size of a development programme. Moreover, it is not enough to know the total size of a development programme. From an operational standpoint it is essential to know in some details the pattern of distribution of resources among various types of activities.

Ours is a simple consistency model, not a usually more attractive optimizing model. In an optimizing model of this size it is necessary not only to specify all the structural constraints but also a large number of "realistic" con-

*The author is a Research Director at the Institute. The research underlying this paper was undertaken at the request of the Planning Department of the Government of East Pakistan hich made available to the Institute a special grant to finance certain expenses related to the search project. Dr. A.K.M. Ghulam Rabbani, C.S.P., deserves much of the credit for conving the idea of the project and helping the author at various stages. Others who deserve cial mention for their kind cooperation are: Dr. Robert Repetto, Mr. Mahfuzur Rahman, . Abdus Samad and Dr. Nuruddin Chowdhury. Mr. Ghulam Mahmud Khan, Mr. Matiur man Dhaly and Mr. Shamsul Huda provided research assistance. Mr. Hanifuddin Mia and Mr. Mohammad Musa handled the computations at the Atomic Energy Centre, Dacca, while Dr. Arthur MacEwan got some preliminary computations done at Harvard. Many others helped but they are too numerous to mention.

straints to guard partly against the tendency of such linear models to select extreme points and partly against the overemphasis on a single objective. This not only requires a great deal of additional practical knowledge and anticipation but also renders the size of the programme so large as to make its computation much more difficult. On the other hand, a consistency model has very important virtues. Determining the feasibility of a plan is itself an important achievement. In addition, it is possible to generate a set of alternative feasible plans by varying the targets and policies to quantify important trade-off ratios between sets of resources and objectives. These are useful guides in formulating a more desirable plan and hence to a certain extent substitute for a fully optimizing model.

Our model is essentially a terminal-year exercise: it attempts to project the possible state of affairs in the terminal year of the Fourth Plan (1974/75) which are consistent with certain targets and objectives as well as other historically determined conditions. It also estimates the cost in terms of scarce resources, *e.g.*, investment and foreign exchange, which must be incurred over the plan period to reach the stipulated state of affairs in 1974/75. It is not, however, a fully intertemporal model because it does not explicitly specify the state of affairs in each of the intervening periods. A fully intertemporal model would be several times the size of a terminal-year model and hence would entail much greater computational burden. It would, however, be worthwhile to undertake this additional computational burden if no other problems were involved. But the use of an intertemporal model requires detailed information about investment-output lags and their distribution. No simple assumption about some average time lag would do. It is well known, however, that the knowledge about time lags is almost completely nonexistent. Nor is it advisable to try to "guess" such a large number of lags, one for each type of fixed asset for each sector. The results would usually be sensitive to the assumed values of lags.

Although our model is of the terminal-year variety, we do say something about the time-path of investment during the plan period and about the immediate post-terminal growth. This is incorporated in the investment demand function which specifies a given pattern of growth in investment and some average time lag between investment and output.

The model finds out the cost in terms of scarce resources of alternative growth targets, given certain export possibilities and the possibilities of import substitution both with respect to West Pakistan and the rest of the world. It also distributes these resources over the twenty-nine producing sectors as well as finds out the rates of expansion of these sectors. The model also quantifies the gaps between the supplies and the requirements of resources.

The two resources we single out are investment and foreign exchange.

Undoubtedly, these are the two most important resources whose shortages constrain the development of most underdeveloped countries including both the regions of Pakistan. This, however, is not to suggest that there are no other scarce factors. Although the supply of unskilled labour is nearly perfectly elastic, the supply of skilled labour is not. It would be highly desirable to make the demand for skilled labour endogenous. Unfortunately, the state of statistical information does not allow us to do so.

The model provides quantitative information about the gaps between the requirements and the supplies of the two resources, *viz.*, the savings-investment gap and the foreign-exchange (or export-import) gap. By varying the target growth rate, export target and the import-substitution possibilities, we can reduce or enlarge these gaps and get some ideas about the important trade-off ratios.

1.2 Sector Classification

We want projections on a reasonably detailed basis so that they can be useful in deciding the broad outline of the plan. We, however, have to keep the details limited in order to be able to derive most of the information about intersectoral relations from existing sources and solve the system repeatedly using the computational resources available within the country. The sector classification in Table I is used, keeping these considerations in mind.

TABLE I

SECTORS IN THE MODEL

1. Rice-growing and processing
2. Jute-growing and baling
3. Tea
4. All other major and minor crops, livestock, forestry and fishery
5. Sugar
6. Edible oils
7. Cigarettes and tobacco products
8. Miscellaneous food and drinks
9. Cotton textiles
10. Jute textiles
11. Other textiles
12. Paper and printing
13. Leather and rubber products
14. Fertilizer
15. Chemicals
16. Cement
17. Basic metals
18. Metal products
19. Mahcineries

20. Transport equipment
21. Construction
22. Miscellaneous manufactures
23. Coal and petroleum
24. Electricity and gas
25. Transport
26. Trade
27. Housing
28. Government
29. Miscellaneous services

Each of the first three sectors includes growing, harvesting and processing of a principal crop. The fourth sector, called all other agriculture for short, is a rather heterogeneous sector of residual category: it includes the growing and processing of non-rice-tea food crops and cotton, growing of sugarcane, fruits and vegetables, livestock products, forestry, fishery, oilseeds and tobacco, including its minor processing. It is assumed that agricultural activities of sectors 1 to 4 include such ancillary activities as trading and transporting crops to rural processing units (farmers themselves in many cases) and to rural consumers. On the amounts sold in the urban markets and the large-scale manufacturers and the amount exported, however, trade and transport margins have been charged.

The next four sectors are food-processing industries. Sectors 9 to 17 and 22 and 23 produce manufactured consumption and intermediate goods. Titles explain the contents of these sectors reasonably well. It should be emphasized that all manufacturing sectors (and the processing of crops) include large-scale and small-scale activities. Any projection work using this kind of sector-aggregation scheme will require an *a priori* decision regarding the incremental importance of each part of each sector. Since ours is a consistency model, we have to make the projection of such shares outside the model.

Mining and quarrying activities have been vertically integrated with the manufacturing sectors to which they deliver. This procedure is preferable to aggregating together very different mining activities. Since mining and quarrying are trivial in East Pakistan this has no significant effect.

Five of our sectors, 18 to 22, supply fixed capital. One of them, construction, supplies building and construction capital while the other four capital-supplying sectors provide plant, machinery, transport equipment, office equipment, furnitures and fixtures. Of these the quantity of fixed capital supplied by metal products (18) and miscellaneous manufactures (22) is very small. They are predominantly consumption-goods sectors.

The contents of the remaining sectors—transport, trade, and the services — are sufficiently explained by their titles.

We have not made any detailed discussion of the justification of the procedures outlined above. This has, however, been provided by Khan and MacEwan [15] in details.

1.3 Prices

All the exercises are done at 1964/65 market (*i.e.*, purchasers') prices. The reason for using the 1964/65 prices is simply that 1964/65 seems to be the last year at whose prices most of the information is available. An additional advantage is that 1964/65 is the base year of the current five-year plan. The results can of course be transformed into any other year's price as long as we know the sectoral price indices for that year.

The significance of the use of purchasers' price in an intersectoral model is that each industry is assumed to pay the trade and transport costs on all its sales of output, and the value of these services together form the trade and transport input into that industry. The reason we use the purchasers' price is that our basic sources of data on intersectoral purchases all use such prices.

The foreign-trade entries must also be made at purchasers' prices. Exports abroad and imports from abroad are stated in Central Statistical Office's *Foreign Trade Statistics* respectively at *f.o.b.* and *c.i.f.* prices. For our purpose, it is satisfactory to treat the *f.o.b.* price as the relevant purchasers' price of exports. The purchasers' price of imports is, however, higher than the *c.i.f.* price by the amount of import duty and trade and transportation costs incurred in taking the imported goods to its various users within the region from the port of entry. Imports from West Pakistan must also be similarly treated. We shall see later that the sectoral balance equations for transport and trade have to be especially adjusted to take into account the regional transport and trade required for the marketing of the imported goods.

2. THE MODEL

2.1 Notations

In the following algebraic notations the subscripts i, j denote the producing sectors (i , j = 1, 2, . . . , 29). In case of double subscripts, the first refers to the supplying sector and the second to the using sector. Unsuperscripted variables denote changes over the Fourth Plan, *i.e.*, between 1969/70 and 1974/75. Superscript T denotes value in 1974/75, 0 denotes value in 1969/70 and, in general, t denotes value in year t (t = 1 refers to 1970/71, t = 2 to 1971/72, . . . , t=5=T to 1974/75). We denote for sector i

X_i = gross value of production
X_{ij} = current input supplied to sector j
B_{ij} = fixed capital input supplied to sector j for new capacity creation

W_{ij} = working capital supplied to sector j
M_i = endogenous foreign import
M_i' = endogenous import from West Pakistan
C_i = personal consumption
G_i = public consumption (*i.e.*, expenditure on public administration and defence)
E_i = foreign export
E_i' = export to West Pakistan
R_i = replacement demand for fixed capital
$\bar{M}_i$ = exogenous foreign import for final consumption
$\bar{M}_i'$ = exogenous import from West Pakistan for final consumption
V_j = gross value added at market price (*i.e.*, gross value added at factor cost plus indirect taxes)

2.2 Sectoral Balance Between Supply and Demand

The first set of equations of the model refers to the balance between availability and use of the products of each sector

$$(a)\ X_i + M_i + M_i' = \sum_j X_{ij} + \sum_j B_{ij} + \sum_j W_{ij} + C_i + G_i + E_i + E_i' + R_i - \bar{M}_i - \bar{M}_i'$$

The left-hand side elements are components of supply while the right-hand side elements are sources of demand. Only for a few sectors will all the elements be non-zero. For the non-tradable sectors (services, electricity, for example), all export and import components will be zero. Fixed-capital deliveries and replacement demand will exist only for the five fixed-capital supplying sectors (18 through 22). Personal consumption of non-consumption-goods supplying sectors (*e.g.*, basic metal, construction) will of course be zero. Public consumption consists only of one sector's services, government (*i.e.*, public administration and defence).

Exogenous imports refer to those use-specific complementary demands for imports which are required for final consumption. They are related to the latter through fixed coefficients. Since final consumption in the model is an exogenous target, the demand for such imports may also be shown as exogenous.

2.3 Current Input Demand Function

Following the standard Leontief type of input-output assumption we make the intersectoral current input deliveries proportional to the output levels of the using sectors

$$(b)\ X_{ij} = a_{ij} X_j.$$

Since our variables denote *changes* and not *total* levels we need not assume simple proportionality between total current input of each type and total output of the using sector. We merely assume fixed *incremental* current input-output coefficients.

The value of current inputs is defined as the actual amounts used up in the production process. We have not included rent as current input to producing sectors and have no sector producing rental services of non-residential buildings. Instead, we have adopted the more usual, and preferable, alternative of treating all non-residential buildings as capital in the relevant producing sectors. The only parts of "depreciation" which we have included as current inputs are purchases of spare parts and repair and maintenance of houses. Other "depreciation" charges are treated as replacement. Alternatives could conceivably be desirable but empirically would be more difficult.

2.4 Fixed Investment Demand Function and Stock-Flow Conversion Factor

The next step consists of expressing the deliveries of fixed-capital inputs as linear functions of the output levels of the receiving sectors. We can express the assumption of fixed capital-output ratios as follows

$$\int_{t=-\theta}^{5-\theta} B_{ij}^{t}\, dt = b_{ij}X_j$$

where $\int_{t=-\theta}^{5-\theta} B_{ij}^{t}\, dt$ is total fixed capital input of the i-*th* type in the j-*th* sector during the five years from $t = -\theta$ to $t = 5 - \theta$, b_{ij} is the incremental coefficient of the i-*th* type of fixed capital into the j-*th* sector and θ is the average investment output lag.

Our balance equations, however, contain changes in investment in year T over year 0, *i.e.*, $B_{ij} = B_{ij}^{T} - B_{ij}^{0}$. We know B_{ij}^{0} as given base-year magnitude. Hence, all we have to do is to express the terminal-year investment, B_{ij}^{T}, as proportion of total investment between $t = -\theta$ and $t = 5-\theta$. This we do by assuming

$$B_{ij}^{T} = h_1 \int_{t=-\theta}^{5-\theta} B_{ij}^{t}\, dt$$

i.e., the terminal-year investment in fixed capital of type i in sector j is a given proportion h_1 of total fixed capital of type i required to build up an additional X_j amount of output capacity in sector j with an average time lag of θ years.

What is the rationale behind the assumption of this kind of "stock-flow conversion factor"? Usually its value is determined by assuming some kind of smooth growth in investment over time. Let us assume that investment of each type increases exponentially over the plan period

$$B_{ij}^{t} = e^{rt}$$

where e^{rt} is the investment index in time t, with the annual exponential growth rate of r. We have

$$\int_{t=-\theta}^{5-\theta} B_{ij}^{t}\,dt = \int_{t=-\theta}^{5-\theta} e^{rt}dt = \frac{1}{r}\left[e^{r(5-\theta)} - e^{-\theta r}\right]$$

We, therefore, have

$$h_1 = \frac{e^{5r}}{\frac{1}{r}\left[e^{r(5-\theta)} - e^{-\theta r}\right]} = \frac{re^{\theta r}}{1-e^{-5r}}.$$

We now have an expression for B_{ij}:

$$(c)\quad B_{ij} = B_{ij}^{T} - B_{ij}^{0} = h_1 b_{ij} X_j - B_{ij}^{0}.$$

The assumption of some kind of stock-flow conversion factor is inevitable in the comparative static models of planning and growth. Variants of such assumption have been used by Manne [19 ; 20], Sandee [24] and others. One advantage of the stock-flow conversion factor is its relative insensitivity to r and θ. Table II gives the values of h_1 for alternative values of θ and r.

TABLE II

STOCK-FLOW CONVERSION FACTORS FOR ALTERNATIVE θ AND r

	θ	r	h_1
1.5	years	.07	.263
1.5	years	.08	.274
1.5	years	.10	.296
1.25	years	.07	.259
1.25	years	.08	.268
0	years	.07	.237
0	years	.08	.243
0	years	.10	.254

We use the value of .296 which would result from the assumption that the gestation lag is on the average a year and a half and that investment will grow exponentially at 10 per cent per year[1]. However, it should be noted that by using the value of .296 we need not commit ourselves to any single value of r or θ. A large number of alternative combinations of r and θ would give the same value for h_1. In fact, the stock-flow factor can be given a more general interpretation than is implied by the assumption of some kind of smooth growth in investment[2].

[1]It has been pointed out to me that in the formulation of the five-year plans, annual investments are discrete variables whereas in the above demonstration we derived value of the stock-flow conversion factor by specifying investment as continuous. Note that the specification of investment as discrete does no harm to the assumption of stock-flow factor. It then becomes, with a time lag of θ years, and annual compound growth rate g :

$$h_1 = \frac{(1+g)^5 B_{ij}^0}{\sum_{t=1-\theta}^{5-\theta} (1+g)^t B_{ij}^0} = \frac{(1+g)^5}{\sum_{t=1-\theta}^{5-\theta} (1+g)^t}$$

For $\theta = 1.5$ and $g = 10$ per cent the value of h_1 turns out to be .277, or a value of $h_1 = .296$ would imply just over 10 per cent annual compound rate of growth. In the main text we use the continuous case for the convenience of computation. It should, however, be noted that the discrete case presents no problem; the growth rate (g) that is implicit is simply slightly larger, other things being equal.

[2]The assumption of smooth growth in investment is rather restrictive. It assumes most of the indivisibilities away and forces the assumption that one can build capacity bit by bit as demand grows. In a mature economy in which each new project is small in comparison to the total capacity of the sector this may be a justified assumption. But in an economy like East Pakistan's it may sometimes turn out to be unrealistic.

In discussing the numerical results of the model below we have often talked about a value of $\theta = 1.5$ years. Our gestation lag is an *average* — a year and a half's average lag means the application of capital inputs can start something like three years before output becomes forthcoming. This does not, therefore, seem in general to be too short a time lag. In fact, for certain sectors like agriculture and small-scale industries this may turn out to be too long a lag.

In fact, we need not assume any given time lag for all the sectors — we can rationalize our use of a fixed h_1 by assuming that the sectors with shorter (longer) lag will have relatively more (less) rapid acceleration of investment (*i.e.*, higher (lower) r) to compensate.

2.5 Demand for Additional Working Capital

The treatment of working capital is similar to that of fixed capital except that in this case the time lag is insignificant for all practical purposes. Unlike fixed capital, the stock of working capital can be built up in the same time period in which the expansion of capacity takes place[3]. The stock-flow conversion factor, h_2, would, therefore, be given by

$$h_2 = \frac{e^{5r}}{\int_{t=0}^{5} e^{rt}dt} = \frac{r}{1 - e^{-5r}} .$$

We, therefore, have

$$\text{(d)}\quad W_{ij} = W_{ij}^{T} - W_{ij}^{0} = h_2 w_{ij} X_j - W_{ij}^{0}.$$

We have chosen $h_2 = .254$ which implies an r of 10 per cent.

2.6 Regional and Foreign Imports

In the situation of acute shortage of foreign exchange, as characterizes Pakistan, all imports are complementary in the *ex-post* sense. *Ex-ante*, however, some imports can be treated as competitive in the sense that additional domestic capacity can be created if planned in time.

One can identify two broad classes of complementarities arising out of two different sets of circumstances. One class of complementarities derives

[3]This frequently is not recognized by the users of such conversion factors. *See*, Manne and Rudra [20] for an example of the use of the same stock-flow conversion factor for fixed and working capital even with an explicit time lag.

from the fact that a particular kind of import classified under a domestic producing sector either is technologically impossible to produce domestically or its potential cost of production is known to be very much more than for the aggregate domestic sector. Such imports will be identified and their destinations will be known. Frequently, such products would be use-specific and the pattern of their distribution among users would be dissimilar to the pattern of the distribution of the products of the aggregate sector under which they have been classified. Examples are: *a*) most of the superior-cotton imports into East Pakistan which cannot be produced domestically due to technological considerations and is used up entirely by the cotton-textiles sector while domestic all other agriculture, the sector under which cotton is classified, delivers also to other sectors; *b*) books and magazines which are published abroad and cannot be printed domestically — products used up for final consumption purposes. We give to this type of imports the title of use-specific complementary imports.

A second kind of complementarity derives from the consideration that although there are no technological or other considerations militating against the substitution by domestic production of any single kind of the imported goods classifiable under any given aggregate sector, it would be quite impossible to substitute all such imported goods by domestic production within the next five or ten years. Machinery import is an example. It would be quite possible to substitute almost entirely by domestic production the import of any single kind of machines, say, sewing machines for example, over the fourth-plan period. But it would be impossible to substitute entirely the import of all kinds of machineries. It would be arbitrary and misleading to select a few of these machines as complementary. All we know is that the import substitute of the sector as a whole cannnot be driven faster than a given rate. We give to this class of imports the name of the non-use-specific complementarity.

Note that *ex-ante* there will exist some degree of freedom with respect to such complementary imports. This kind of complementarity is simply a limitation on the rate of expansion of domestic production of the corresponding sector. It appears that such limits on self-sufficiency can better be expressed as minimum import ratio rather than as maximum absolute production. The latter is necessarily arbitrary whereas the former may be based on a ranking of the subsectors according to the ease with which they can be replaced by domestic production, making a decision on a border line upto which import replacement should be driven during the given plan period and looking into the base-year share of the total use of the remaining subsectors.

The essential distinction between the two types of complementary imports is that in the former case we know who the users of these imports will be while in the latter case we do not know who the users will be. All we know in the second case is that the domestic use of a particular sector's products must consist

of a certain minimum proportion of imports — a proportion which can to a limited extent be varied *ex-ante*.

We express the use-specific complementary imports ($_uM_i$) as proportions of the activity levels of the using sectors,

$$_uM_i = \Sigma q_{ij}X_j + q_{ic}C$$

where the last term is what we call exogenous import (since consumption is an exogenous target) and is treated along with other exogenous elements of the model. The non-use-specific complementary imports ($_cM_i$) are expressed as given proportions of the sectoral domestic outputs,

$$_cM_i = p_iX_i .$$

Thus, our total *endogenous* imports from abroad and from West Pakistan can each be expressed as

$$\text{(e)}\quad M_i = \sum_j m_{ij} X_j$$

where $m_{ij} = q_{ij}$ for all $i \neq j$ and $m_{ii} = q_{ii} + p_i$; and

$$\text{(f)}\quad M_i' = \sum_j m_{ij}' X_j$$

where $m_{ij}' = q_{ij}'$ for all $i \neq j$ and $m_{ii}' = q_{ii}' + p_i'$.

Note that for our kind of a model it would be of particular interest to observe how *ex-ante* variations in the p_is affect the foreign-exchange gap and the investment cost of the plan.

2.7 The Final Form of the Balance Equations

Substituting (b), (c), (d), (e) and (f) into (a) we get the 29 supply and demand balance equations for our sectors:

$$\text{(1—29)}\ X_i + \sum_j (m_{ij} + m_{ij}' - a_{ij} - h_1 b_{ij} - h_2 w_{ij})\, X_j = C_i + G_i + E_i + E_i' + R_i - \overline{M}_i - \overline{M}_i' - B_i^0 - W_i^0$$

where $B_i^0 = \sum_j B_{ij}^0$ and $W_i^0 = \sum_j W_{ij}^0$.

The balance equations for trade and transport sectors have to be specially adjusted to take into account the inputs from these sectors to imports (see subsection 1.3 above). For these sectors we have

$$X_i = \sum_j X_{ij} + \sum_j T_{ij} + \sum_j T_{ij}' + C_i$$

where T_{ij} = trade (transport) input into j-*th* type of foreign import,

T'_{ij} = trade (transport) input into j-*th* type of regional import.

None of the other components of demand and supply exists because these services are non-tradable and not used as fixed or working capital.

We assume that trade (transport) input required per unit of foreign (regional) import of j-*th* type is fixed

$$T_{ij} = t_{ij} M_j = t_{ij} \sum_i m_{ji} X_i \text{ and}$$

$$T'_{ij} = t'_{ij} M'_j = t'_{ij} \sum_i m'_{ji} X_i,$$

whence we have for these sectors the following form of the balance equations:

$$X_i - \sum_j a_{ij} X_j - \sum_j t_{ij} \sum_i m_{ji} X_i - \sum_j t'_{ij} \sum_i m'_{ji} X_i = C_i$$

2.8 The "Elements on the Right"

The solution of the 29 equations system can be obtained once we are able to specify the components on the right-hand side of the equations. The details of their estimation are stated in the next section. Here we briefly indicate the procedure. Total consumption, C , is set as a target and the consumption of individual sector's products is related to total consumption through the Engel functions

$$C_i = c_i C$$

where c_i is the marginal consumption coefficient for sector i. Although the above relations are linear and homogeneous we actually base them on linear approximations of more general forms of Engel functions. Public consumption expenditure, which consists only of public administration and defence, is set as a target. Similarly, exports are what may reasonably be considered as feasible targets. Replacement demand depends on the historical pattern of investment and certain assumptions related to the mortality pattern of fixed assets. "Exogenous imports" are estimated as fixed proportions of target consumption. Base-year investments are "historical" data although we have to project them because these historical events are yet to take place.

2.9 Macro-Economic Accounts

Once the system is solved we shall be able to derive not only the required sectoral expansions, the required investment in each sector by type of assets, and the required foreign-exchange allocation for each user and on each category of goods, but also a complete set of macro-economic accounts.

Increase in value added in sector j is a linear function of the increase in output of sector j

$$V_j = v_j X_j$$

where $v_j = (1 - \sum_i a_{ij})$. Increase in gross regional product (GRP) is given by the equation

$$Y = \sum_j V_j = \sum_j v_j X_j$$

Note that the GRP and the sectoral values added are at market prices, *i.e.*, they include indirect taxes. We do not separate indirect taxes because we do not concern ourselves with the financial problems of the plan formulation. This could certainly be incorporated into our system but would require a great deal of additional information about sectoral saving rates and the saving rates of various groups of primary factors. We simply do not have any such information. It, therefore, seems appropriate to leave the entire financial aspect of the plan out of the present framework to be analyzed with the help of a separate (perhaps more aggregated) model and to concentrate in the present model on the real aspects of plan formulation.

Thus, our model simply specifies the required rate of real investment and foreign-exchange requirement and states that once these requirements are met the plan targets can be achieved. It does not get involved in the fiscal problem of how the required savings can be generated and how the gap between exports and required foreign exchange can be financed.

Investment for new capacity in the terminal year of the plan is given by

$$I_T = h_1 \sum_j \sum_i b_{ij} X_j + h_2 \sum_j \sum_i w_{ij} X_j.$$

Fixed investment for new capacity to be completed during the five years upto θ years before July 1, 1975 is given by

$$\sum_j \sum_i b_{ij} X$$

while actual fixed investment for new capacity during the fourth-plan period is given by

$$\frac{h_1}{h_2} \sum_j \sum_i b_{ij} X_j.$$

Investment in working capital (for which $\theta = 0$) during the Fourth Plan is given by

$$\sum_j \sum_i w_{ij} X_j.$$

Note that the fixed investment for new capacity during the last θ years of the Fourth Plan will contribute to output increase in the post-terminal years so that there would be a discrepancy between investment required for the achievement of the fourth-plan targets and the actual investment taking place during the fourth-plan period.

The former (called 'lagged investment') is given by

$$\sum_j \sum_i b_{ij} X_j + \sum_j \sum_i w_{ij} X_j + \sum_{t=1}^{5} \sum_i R_i^t$$

while the latter (called 'actual investment') is given by

$$\frac{h_1}{h_2} \sum_j \sum_i b_{ij} X_j + \sum_j \sum_i w_{ij} X_j + \sum_{t=1}^{5} \sum_i R_i^t.$$

The latter is greater than the former by

$$\left(\frac{h_1}{h_2} - 1 \right) \sum_j \sum_i b_{ij} X_j .$$

Both the investment-savings gap and the foreign-exchange gap will be determined endogenously. Since our model is at purchasers' prices showing the imported goods not at their foreign-exchange costs but at their market prices, a few manipulations will have to be made to determine these gaps. Let us write

$$M_i = N_i + Q_i + T_i \quad \text{and}$$

$$M_i' = N_i' + T_i'$$

where

$N_i (N_i')$ = foreign (regional) import at *c.i.f.* value,

Q_i = import duty and indirect taxes on imports, and

$T_i (T_i')$ = trade and transport input on imports.

Our balance equation then becomes

$$X_i = \sum_j X_{ij} + C_i + G_i + E_i - (N_i + Q_i + T_i) + E_i' - (N_i' + T_i') + B_i + W_i + D_i$$

We also have

$$X_j = \sum_i X_{ij} + V_j .$$

But $\sum_i X_i = \sum_j X_j$ whence we have

$$Y = C + G + (E - N - Q - T) + (E' - N' - T') + B + W + D$$

where $C = \sum_i C_i$, $G = \sum_i G_i$ *etc.*

We, therefore, have

$$(B + W + D) - (Y - C - G + Q + T + T') = (E - N) + (E' - N')$$

The expression on the left is the investment-saving gap (note that Q, T and T′ are components of saving because they are parts of GRP at market price which are not spent on consumption or as current inputs for the domestic production of goods and services) and the expression on the right is "foreign-exchange" gap. Total "foreign-exchange gap" consists of the sum of import surplus with rest of the world and import surplus with West Pakistan.

Note that in our model, Q_i and $T_i(T_i')$ have been expressed as fixed coefficients of $M_i(M')$ so that $N_i(N_i')$ can also be expressed as fixed proportion of $M_i(M_i')$.

$$N_i = n_i M_i \text{ and}$$

$$N'_i = n'_i M'_i$$

where n_i = foreign-exchange coefficient of import at purchasers' price and

n'_i = ratio of *c.i.f.* price to purchasers' price of regional imports.

3. ON THE DATA FOR THE EMPIRICAL IMPLEMENTATION OF THE MODEL

3.1 Data Requirement

The empirical implementation of the model requires a great deal of statistical information related to the structural and behaviourial interrelationship within the economy and to the exogenous variables. We have chiefly depended on the work of the Quantitative Planning Section of the Pakistan Institute of Development Economics (PIDE) supplemented by the work done at the Planning and Development Department of the Government of East Pakistan. Below we list the major types of data used in the model and briefly discuss the methodology of obtaining each of them.

3.2 Incremental Current Input-Output Coefficients

The basis of our estimates of the current input coefficients is the 1962/63 matrix developed at the PIDE. Its methodology has been described in details by Khan and MacEwan [15]. The procedure adopted in obtaining the incremental coefficients may briefly be described in the following steps:

a) The first step was to bring the Khan-MacEwan table into line with our sector classification by making minor aggregation and disaggregation of a few sectors.

b) The original Khan-MacEwan table is at 1962/63 purchasers' prices. Since our exercise is at 1964/65 prices we had to transform the coefficients into that year's prices.

c) The original Khan-MacEwan table provides for each sector separate input coefficients column for large- and medium-scale, small-scale and cottage production. It can be observed that over time large-scale processes are coming to dominate over small-scale. It was assumed that in each manufacturing sector the elasticity of small-scale production with respect to aggregate small and large production will be 0.5, *i.e.*, the incremental share of small scale will be half its average share. The incremental coefficients for each sector were based on this assumption.

Of course, the assumption of a uniform elasticity of small-scale production of 0.5 is rather weak. However, the general order of magnitude is probably correct particularly for the big sectors. Moreover, it should be pointed out that for many sectors small-scale production was sufficiently negligible or nonexistent in the 1962/63 table so that it could be ignored in the increment.

d) Some of the sectors in 1962/63 were so different from what their increments in later years have been in terms of product composition and input structure that it would be unrepresentative to use their 1962/63 coefficients for future projection purposes. Information, therefore, was collected about the input structure of the recently completed "representative" projects in these sectors from EPIDC sources. This information was used to adjust the input coefficients of the relevant sectors. Prominent among these sectors are basic metals, machineries and, to some extent, fertilizer and cement.

In 1962/63 there was no production of coal and petroleum products in East Pakistan. Some capacity has since been created within the region in petroleum, but information about its input structure was not available. In order to include a coal and petroleum product sector in the incremental table of East Pakistan, the West Pakistan coefficients have been used with important adjustments on the basis of international data.

3.3 Incremental Fixed Capital Coefficients

We used the following four major sources of statistical information in estimating the incremental fixed capital coefficients.

a) Khan and MacEwan [16] have made a comprehensive set of estimates on the basis of a sector classification which is only marginally different from ours. For large-scale manufacturing industries they estimate the average coefficients

for 1962/63 after adjusting the book values of assets shown in the census of manufacturing for the discrepancy for each asset between actual deterioration pattern and depreciation practices adopted by enterprises and for the rising prices of different assets over time.

The limitation of these estimates is primarily due to the fact that they are average coefficients at a historical point of time and hence needs adjustment in order to be useful for future projections. Such adjustments should be based on considerations such as the changing pattern of products and techniques, increase in efficiency arising out of learning by doing and so on.

b) Robert Repetto of the East Pakistan Planning Department has estimated sets of capital coefficients on the basis of the information obtained from the IDBP and PICIC-sanctioned projects[4]. While the main weakness of the Khan-MacEwan estimates is that they are *averages* for a given year, the main problem about the Repetto estimates seems to be that they are based on the projects yet to be completed and not on the projects just completed.

c) For a number of sectors we have been able to get information on the values of capital assets and capacity output for projects which are going on or have just been completed. This information has been of particular value for sectors for which our base-year output composition appears to be unrepresentative of the expected incremental output.

d) Finally, we have some international estimates for comparison. Two of the estimates of this kind that we have used are the capacity expansion planning factors of the National Planning Association of the United States [22] and Alan Manne and Tom Weisskopf's estimates for India [21].

The procedure we have followed in selecting a set of capital coefficients for large-scale manufacturing sectors can be described as follows:

a) For a number of sectors we have simply used the Khan-MacEwan estimates either because they are very similar to the Repetto and/or the other country data or because we have no evidence or *a priori* reason to expect that for them the incremental coefficients would be any different from average. These sectors are sugar (adjusted for capacity utilization), edible oils, cigarettes, miscellaneous food and drinks, jute textiles, leather and rubber, metal products and miscellaneous manufactures. For coal and petroleum we have used Khan and MacEwan's West Pakistan estimate for the same reason as mentioned in connection with this sector's current input coefficient estimates.

b) It was thought that for basic metal, machinery, fertilizer, cement and electricity, the composition of incremental output would be very different from

[4]These estimates are still unpublished.

the average output in 1962/63. We, therefore, have used the coefficients directly estimated from the reports about EPIDC and EPWAPDA projects. For similar reasons we have used Repetto's estimates for chemicals and somewhat arbitrarily made an upward adjustment in Khan-MacEwan estimate for transport equipment. In all these cases the estimated incremental coefficients are higher (and frequently very significantly so) than the average 1962/63 coefficients except for electricity and fertilizer for whom they are lower. This is generally in line with the expectation based on international data that the capital cost of creating domestic capacity for capital goods and heavy industries is relatively high. Khan-MacEwan estimates for them are probably understatements in view of the peculiar product composition of these sectors in 1962/63.

c) For textiles and paper the Khan-MacEwan estimates appear too high. This probably is due to the relatively inefficient use of capital by these sectors in 1962/63 which we hope will be overcome in future. We have made downward adjustment in them on the basis of an arbitrary compromise between the evidence found in Repetto, Weisskopf and National Planning Association.

d) The disaggregation of total capital coefficient into supplying sectors has been done according to the procedure adopted by Khan and MacEwan.

3.4 Incremental Working Capital Coefficients

Every productive enterprise requires inventories of raw materials and finished and semi-finished products for well-known reasons. Besides, there exists the pipeline stock of the products which have left the factory gate but have not yet reached the user. It would be quite appropriate to allocate the pipeline stocks either to the trade sector or to the respective using sectors. But we do neither and instead allocate the pipeline stock to the respective producing sectors. In a consistency model this procedure should present no difficulty while in an optimizing model this could conceivably distort the relative capital costs of output expansion in various sectors.

Total raw materials and products inventory coefficients have been estimated by fitting linear regressions to the data obtained from all the available censuses of manufacturing industries. The total raw material inventory coefficient has been split into supplying sectors by assuming that raw materials are bought in the same proportion in which they are used, *i.e.*, such split is in the same proportion as the coefficients of current input from the relevant supplying sectors.

We do not have any information about raw material and product inventories for small-scale sectors and we have used for them the coefficients for corresponding large-scale sectors. Although it seems plausible that the small-scale activities require less fixed capital than large-scale, it is by no means plausible that they also require less working capital.

Pipeline stocks are estimated on the basis of assumed lags between production (importation) and final use. Generally, we use two months' lag except for a few commodities for which a different procedure is adopted for special reasons.

Raw material inventories for nonmanufacturing sectors have generally been estimated according to the same procedure outlined by MacEwan [18] with certain exceptions.

3.5 Import Coefficients

The meaning of our import coefficients has been explained in detail in the previous chapter. Our first step is to identify and quantify the use-specific imports from abroad and from West Pakistan. This we do for the year 1962/63 and assume that in general such imports are used up by the large-scale industries. Allocation to small-scale industries has been made only when there is a balance after satisfying total requirements by large-scale manufacturing. We think it reasonable to assume that the incremental coefficients would be the same as average. Thus for the aggregate using sector we have estimated the incremental coefficients by taking a weighted average of the large- and the small-scale coefficients, weights being proportional to the incremental shares of each technique. It should be emphasized that for want of information we have failed to specify many of the use-specific imports. We have only been able to identify the big and obvious ones while many smaller ones remain unidentified. They, therefore, get lumped with the non-use-specific imports.

We have already indicated that the non-use-specific import coefficients should be best regarded as constraints on the rate of import replacement by domestic production. We have also stated that they are obvious candidates as variables in a sensitivity analysis. We use two sets of such coefficients: one pertaining to what we call the "moderate (or low) import-substitution case" and the other to "rapid import-substitution case".

The sectors for which it is particularly important to specify these constraints are the investment goods and related industries (basic metals, metal products, machineries and transport equipment) because our imports are heavily concentrated in them. For the moderate import-substitution case we set the import coefficients of these sectors at the level at which we think the perspective plan would want them to be during the fourth-plan period. For the capital-goods sectors the Perspective-Plan projects an import elasticity with respect to output of 0.6 for the fourth-plan period for Pakistan as a whole (*i.e.*, annual growth rate of 10 per cent for production and 6 per cent for imports). We apply this to the benchmark ratio of imports to obtain incremental ratios. For the rapid import-substitution case we generally use an elasticity of imports 2/3 as high as the above case.

For other non-use-specific imports we have set the coefficients after reducing arbitrarily the coefficients in the base-years. In most such cases our incremental proportions are between a 1/2 and 2/3 of the base-year average coefficients.

For certain vertically integrated sectors (basic metals, petroleum and rubber) all the self inputs have to be imported because they are use-specific complementary imports.

Denote for such a sector,

M = total import

M' = import of final product (non-use-specific)

M'' = import of raw material (use-specific for the sector itself).

We have

$M'' = aX = mX$ (a is Leontief input-coefficient)

$M' = b(M' + X)$, (*i.e.*, b is the ratio of product import to total supply of the finished product of the sector)

$$= \frac{b}{(1-b)} X,$$

so that

$$M = M' + M'' = \left[m + \frac{b}{(1-b)}\right] X.$$

3.6 Marginal Consumption Proportions

Beginning of these estimates was made by *a*) fitting Engel curves of appropriate types separately to urban and rural household consumption data shown in the *Quarterly Survey of Current Economic Conditions* [6], *b*) making linear approximations to these functions for the projected "appropriate" expenditure level to obtain marginal coefficients, and *c*) taking the weighted average of the urban and rural marginal consumption proportions. The details of each step have been discussed by Khan in [17].

Adjustments in these preliminary estimates have been made for the following considerations:

a) The forms of our Engel curves are not additive, *i.e.*, the sum of all the marginal consumption coefficients estimated from them for the projected level of total expenditure does not add up to one. We, therefore, have to make some upward adjustment in them.

b) For a number of rather unimportant sectors we do not have separate information of expenditure elasticities from the *Quarterly Survey* data. For these sectors we, therefore, have applied other available expenditure elasticity estimates based on Pakistani or Asian data to their base-year consumption proportions.

c) Finally, we have compared the estimates with international data related to countries of similar income levels and made further adjustments where our proportions appeared out of line.

3.7 Replacement

Replacement has been estimated for the products of only three sectors, machinery, transport equipment and construction. The deliveries to fixed investment of the other two capital-supplying sectors are very small and hence the replacement demand for their products would be negligible. We have assumed that such demands are taken care of as part of their current input demand for repair and maintenance.

The first step in estimating replacement is to prepare a series of fixed investment in each of these assets over as many years as we have information for[5]. Next we have applied a set of physical deterioration assumption to this series[6] to obtain replacement requirements in 1969/70 and 1974/75.

It can easily be recognized that the procedure is indeed very tentative, but the results we get look reasonable when compared with other country data. Replacement as percentage of gross investment in 1969/70 would be as follows:

Machinery	24 per cent
Transport equipment	37 per cent
Construction	20 per cent

These are very close to the estimates used by Manne and Rudra [20]. The incremental ratios would be somewhat lower as would be expected in a situation of accelerating investment.

---

[5]Direct estimates from CSO surveys are available for most years from mid-fifties to mid-sixties. Some of these have been published in *Consistency Committee's Report* [8] while others are unpublished and can be obtained from CSO sources. For more recent years, estimates are available at the East Pakistan Planning Department. We obtained estimates of some very early years by assuming certain growth rates. We extrapolated the series for the projection of investment in early fourth-plan years. Note that these estimates have been converted into 1964/65 prices.

[6]The main features of these deterioration assumptions are: *i*) 25-per-cent loss of productive capacity during first half of the assets' life; *ii*) 65-per-cent loss of capacity during next half of the assets' life; *iii*) 10 per cent of capacity remaining at the time of retirement. Life for buildings has been assumed to be 40 years, for machineries 12 to 16 years and for transport equipment 5 to 10 years. For details, *see* Khan and MacEwan [16].

3.8 Agriculture

It is well known that the incremental technology of rice will be remarkably different from its average technique. It is, however, rather difficult to foresee accurately what the actual incremental pattern would be. One inevitably has to make a number of simplifying assumptions. The procedure we have followed is described below.

We have assumed that *a*) new seed under irrigation, *b*) improved local variety under irrigation, and *c*) improved local variety without irrigation will each form a third of the incremental output of rice. We have estimated the coefficients of modern input (irrigation which consists of pump and tubewell, fertilizer, pesticide, fuel and improved seed) for each of these techniques on the basis of the information in the self-sufficiency plan of the East Pakistan Government [12] and some unpublished background information and have obtained weighted average. To these we have added the traditional inputs (based on the price-corrected 1962/63 input-output table) with some reduction in inputs from all other agriculture (animal service, cowdung, *etc.*) to reflect the fact that such inputs are perhaps proportional to acreage (rather than output) so that there would be a decline in such inputs per unit of output as output per acre increases. Inputs into processing have been adjusted to reflect the rising share of milling against home-pounding.

For the other agricultural sectors we have somewhat arbitrarily increased the coefficients of modern inputs and reduced the coefficients of all other agricultural inputs for considerations similar to those discussed under rice.

3.9 Exports

For exports we have two sets of projections, a moderate projection and an ambitious projection. The first one is the basic projection while the second one is obtained simply by raising it by something between a quarter and a third (with some obvious exceptions to account for known limitations).

The moderate projection is primarily based on trend extrapolation with the exception that exports to West Pakistan have been estimated after a reasonably careful analysis of the possible expansion in demand and creation of regional capacity there.

It is easily recognized that export projections are very uncertain and subject to wide variation. The task is, however, rendered manageable by the fact that East Pakistan's exports are extremely undiversified.

The moderate projections amount to more than 20-per-cent increase in exports abroad and about 25-per-cent increase in exports to West Pakistan over the five-year period. These are just under the trend rates of growth, a situation

arising out of the fact that the big items are unlikely to be able to maintain the trend rate of growth in future. New items will probably expand fast but from a very small base.

3.10 Benchmark Estimates

It has been necessary for the implementation of the model to estimate certain benchmark investment, consumption and production figures as well as macro-economic aggregates for 1969/70. Investment estimates enter the balance equations, while consumption and income estimates are necessary to set target and measure growth for the Fourth Plan. We have used the following benchmark estimates of the macro-economic variables (in million rupees at 1964/65 prices):

Gross regional product (GRP)			=	26,405
Fixed investment for new capacity	=	2,125		
Fixed investment for replacement	=	651		
Investment in working capital	=	424		
Total gross investment			=	3,200
Consumption (of which public consumption	=	972)	=	23,800

The above figures imply an import surplus with West Pakistan and the rest of the world of about 600 million.

Gross regional product has been estimated by projecting sectoral outputs to 1969/70. Information for the agricultural sectors has mainly been derived from Raisuddin's benchmark study [23], for industrial sector from the Annual Plan document [2] upto the year 1968/69 and then by extrapolating to the next year on the basis of the information about on-going projects and/or trends, and for the services on the basis of the trends shown by the respective components of national accounts. This, together with our sectoral value-added coefficients, gives an estimate of 26,405 million at 1964/65 prices.

We have made an alternative estimate by using the annual-plan GRP estimate for 1968/69 as the basis and assuming for the following year a 6-per-cent rate of growth. These estimates are at 1959/60 prices. The comparison of the current and constant price GRP estimates from the CSO sources shows that the GRP deflator for 1964/65 with 1959/60 as base was about 1.11. Using this we get an estimate of 1969/70 GRP of 25,403 million at 1964/65 prices. This is 96 per cent of our estimate. The annual-plan estimates, however, do not include certain central government services and defence. If these are included our estimates would be less than 2 per cent higher than the alternative estimate. The

closeness of our estimate to the alternative estimate convinces us about its reasonableness.

Fixed investment estimates are those made by the Planning Department of the Government of East Pakistan. They indicate a 10-per-cent increase over their 1968/69 planned figures. They have been changed to 1964/65 prices.

The method of estimating replacement has been discussed above.

The demand for working capital has been estimated by applying our coefficients to the increase in sectoral outputs in 1969/70 over the previous year.

Import surplus has been 370 million in 1965/66 and 500 million in 1966/67 approximately. We have arbitrarily assumed that it will become about 600 million.

We have obtained consumption as residual. This gives us an average saving rate of about 10 per cent in 1969/70 which is consistent with other available estimates.

4. ALTERNATIVE NUMERICAL FORMULATIONS OF EAST PAKISTAN'S FOURTH FIVE-YEAR PLAN

4.1 Introduction: the Alternatives Explored

In this section we explore the possibilities of the East Pakistan economy during the fourth-five-year-plan (FFYP) period by generating a number of alternative blueprints or 'plans' through a combination of the model outlined in Section 2 and the numerical data described in Section 3. A plan in the present context means a particular way of using up the degrees of freedom in the model. Conceivably such degrees of freedom exist with respect to almost every component of 'final demand' as well as with respect to a number of structural relations. We, however, have assumed that such degrees of freedom primarily exist only with respect to the following targets and policies:

a) the target rate of growth in aggregate consumption,

b) the rates of import-substitution in non-use-specific 'complementary' goods, and

c) the target (or feasible limits to) exports.

The target growth has been specified in terms of increase in aggregate consumption over the fourth-plan period. Growth in income is endogenously determined by the model and is higher than the growth in consumption since the income-elasticity of savings is considerably greater (though not the same) for each of the alternatives explored. We have considered three different rates of

growth in consumption — a 'moderate' one of 6 per cent per year, a 'high' one of 7 per cent and a 'very high' one of 7.5 per cent[7].

As discussed in Section 3, degrees of freedom with respect to imports exist only for the non-use-specific ones. These are mainly capital goods and related commodities. For these we have assumed a moderate rate of import substitution which is quantified to be the same as our interpretation of the perspective-plan target of import replacement for these sectors for the period under consideration. We also have a second case of more rapid import substitution in which case import proportions for these sectors are generally assumed to be lower—about two-thirds as compared with the first case (with some exceptions to deal with certain special features). It is perhaps useful to emphasize that the rapid import-substitution case is almost certainly the limit of feasible import replacement in these sectors during the fourth-plan period. To give an example of how intense an effort has to be made in these directions, the incremental share of regional production in the total use of machineries will have to be nearly half by 1974/75.

For exports again we have used two different projections of increases over the Fourth Plan—a 'normal' one and an 'ambitious' one. The latter is a quarter to a third higher than the former depending on the sector. The details about these projections have been stated in Section 3. The moderate projection is the one we think is the outside limit of what is perhaps realistic. It reveals a rate of growth as high as the trend in the recent past. It is perhaps well known that driving the traditional exports at the trend rate is going to be difficult. Thus new exports, whose base is small, will have to be increased very fast. We, therefore, do not stipulate that the ambitious projection is feasible, without a radically different system of export incentives. Given such incentives the limits are imposed by the state of world demand and by the supply of such scarce factors as skilled manpower needed in marketing efforts. Our exercise simply spells out the implications for feasibility if such obstacles can somehow be overcome.

The six basic numerical solutions to the model we have obtained refer to the following cases:

1. Moderate import substitution, moderate rate of growth

[7]The actual procedure we have adopted in setting the consumption target may be described as follows: public consumption increased over the Third Plan by about 42 per cent. We consider this rather high a rate to be repeated in future taking into account the sharp acceleration in recent past. Corresponding to our three growth rates in aggregate conusmption we have three rates of growth in public consumption over the FFYP—37 per cent, 40 per cent, and 42 per cent.

We have applied to benchmark consumption estimate, the target rate of growth (say, 7.5 per cent per year or 43.56 per cent over 5 years) to obtain target increase in consumption over FFYP. We have subtracted from it the increase in public consumption to obtain target increase in personal consumption. Finally, we have multiplied vector of consumption proportion by this target increase to obtain the vector of target increase in personal consumption.

2. Moderate import substitution, high rate of growth
3. Moderate import substitution, very high rate of growth
4. Rapid import substitution, moderate rate of growth
5. Rapid import substitution, high rate of growth
6. Rapid import substitution, very high rate of growth.

In all the above cases the moderate export projection is assumed. However, a separate solution is obtained for additional exports (*i.e.*, the amount by which the 'ambitious' export vector is greater than the 'moderate' export vector). Since additional exports simply change the 'final demand' vector by the same amount, this solution is additive to the basic cases, *i.e.*, we can obtain for each of the above six cases a corresponding case for ambitious exports by adding the solution for additional exports to the basic case[8].

4.2 What Consists of a Solution?

Each numerical solution (*i.e.*, plan) is feasible both in the macro and micro sense. At the macro-economic level each numerical solution shows the growth in gross regional product (GRP) and its costs in terms of required investment, import and saving. It also shows the numerical measurements of the gaps between the demand for and the supply of each of the two important resources, capital and foreign exchange. At the micro level we obtain a set of equilibrium increase in the outputs of the twenty-nine producing sectors, equilibrium in the present context meaning the balance in the terminal year between the supply of and the (intersectoral current and capital as well as 'final') demand for the products of each sector. Investments and foreign-exchange requirements for each sector by type of assets are also shown.

We have stated in Section 2 that due to our explicit recognition of an investment-output lag there will be a discrepancy between fixed investment required for the achievement of the FFYP target and fixed investment actually taking place during the FFYP period. Likewise total investment required for the achievement of the FFYP target will be different from total investment actually taking place during FFYP. We call the former amount the 'lagged' investment and the latter amount the 'actual' investment. The fixed investment component of lagged investment will have to be completed by approximately January 1, 1974. Under our assumptions the actual investment will of course be greater than the lagged investment.

Gross investment has been shown separately as fixed investment, investment in working capital and investment for the replacement of the deteriorated

[8]Apart from the above cases we have also worked out a few other variants of the model. These have not been reported here. For an account of these, *see* Khan [14].

capacity installed in the past. Investment in fixed and working capital can together be called investment for the creation of new capacity — this is the investment that would have to be undertaken if there were no need to replace deteriorated past capacity.

Thus, we have several measurements of incremental capital-income ratio. Gross capital-income ratio with time lag is the ratio of gross lagged investment to increase in income. Capital-income ratio for new capacity with time lag is the ratio of lagged 'new' investment (*i.e.*, gross investment less replacement) to increase in output. Finally, we have the unlagged capital-income ratio which measures the ratio of actual investment to increment in output. Analytically the lagged measures are the relevant ones. The unlagged ones are of little analytical interest except perhaps that they are comparable to the Planning Commission's (implicit) capital-income ratios.

As discussed in Section 2, the foreign-exchange gap is the excess of imports at foreign-exchange cost (and not at purchasers' price) over exports. Similarly, the import surplus with West Pakistan is the excess of regional imports at *c.i.f.* (and not at purchasers') price over regional exports at *c.i.f.* price.

4.3 A Description of the Basic Solutions

The detailed solutions to the six basic cases have been shown in the Appendix Tables 11 to 16. Let us repeat that the results are in values *at 1964/65 prices*. The transformation of the investment costs into current or base-year prices will require the application of the price indices for investment goods to the values of the various types of investment goods required. We do not attempt such transformation but it seems that the overall price index for investment for 1969/70 with 1964/65 as base may be something like 115 (assuming the trend being maintained between now and June 1970).

An interesting exercise would be the measurement of sectoral elasticities. It would be seen that elasticities of sectoral outputs with respect to aggregate income, consumption or any other component of final demand would vary from sector to sector. Such elasticities with respect to aggregate income would of course depend on the relative sizes of the components of incremental income and would be sensitive to such factors as whether the incremental income derives mainly from, say, consumption or export because the commodity composition would differ widely between such components of final demand. Sectoral elasticities with respect to individual components of final demand could be estimated by systematic variation in such components. By comparing our solutions for the different rates of consumption growth we can measure sectoral elasticities with respect to consumption. It would be seen that such elasticities are extremely high for capital and related sectors like construction, machineries, basic metals and cement — sectors which directly deliver insignificant

or no quantity at all to consumption. This illustrates the powerful leverage of intersectoral demand mainly on capital inputs.

It can be noticed that for each solution more than a half of fixed investment is taken up by a few "economic overheads" and services sectors — electricity, transport, housing and miscellaneous services. This is much greater than the share of these sectors in incremental output. The explanation of course lies in the fact that these sectors are particularly capital costly. Another feature of the solutions is the relatively high share of working capital in aggregate investment. It turns out to be about 12 per cent of aggregate gross investment (compare the unlagged, *i.e.*, "actual" investment costs). This is to be compared with the Third Five-Year Plan's provision of less than 4 per cent of aggregate investment as working capital accumulation. As has been pointed out frequently[9], the Planning Commission estimates are certainly serious underestimates of working capital requirements. It is not enough to estimate fixed capital requirements accurately. We must obtain reasonable estimates of working capital needs as well because additional savings will have to be generated to match such demand.

4.4 A Comparison of the Alternative Plans

4.4.1 Introduction: It seems useful to compare the six basic solutions in their major aspects. Such a comparison will reveal the sensitivity of the major elements of resource costs to changes in the rates of growth, rates of import substitution, levels of exports, *etc.*, and thereby make the task of the ultimate choice of a plan easier.

4.4.2 Size of the Plan: Table III summarizes the broad features of the six basic solutions. The solutions indicate six alternative sizes of the FFYP in terms of actual investment to be undertaken during the plan period[10]. This size ranges from 23.7 thousand million rupees (moderate import substitution and moderate rate of growth) to 31.8 thousand million rupees (rapid import substitution and very high rate of growth) at *1964/65 prices*. At the base-year (1969/70) prices these may be about 15 per cent higher.

[9] *See*, for example, Khan [13].

[10] We use *actual* instead of 'lagged' investment as the measure of plan size. This is for comparability of our measures with those of the Planning Commission.

TABLE III

BASIC SOLUTIONS

(*Values in million rupees*)

	Moderate import substitution			Rapid import substitution		
	Moderate growth	High growth	Very high growth	Moderate growth	High growth	Very high growth
Growth rate in gross regional product (GRP)	6.5%	7.8%	8.4%	6.7%	8.0%	8.7%
Total 'lagged' fixed investment for new capacity	14,650.0	17,830.7	19,466.5	15 328.5	18,752.0	20,512.0
Total investment in working capital	2,733.3	3,382.4	3,714.9	2,918.0	3,633.4	3,999.9
Total replacement demand for fixed capital	3,937.0	3,937.0	3,937.0	3,937.0	3,937.0	3,937.0
Total lagged investment cost for FFYP targets	21,320.3	25,150.1	27,118.4	22,183.5	26,322.4	28,448.9
Gross capital-income ratio with time lag	2.165	2.092	2.063	2.186	2.117	2.091
Capital income-ratio for new capacity (*i.e.*, net of replacement) with lag	1.765	1.764	1.764	1.798	1.801	1.802
Total fixed investment to be actually undertaken during FFYP period	17,072.4	20,779.1	22,685.4	17,863.0	21,852.8	23,903.9
Total investment to be actually undertaken over FFYP period	23,742.7	28,098.5	30,337.3	24,718.0	29,423.2	31,840.8
Unlagged gross capital-income ratio	2.411	2.337	2.308	2.436	2.367	2.340
Fixed investment in 1974/75	4,336.4	5,227.9	5,762.1	4,537.2	5,550.6	6,071.6
Investment in working capital in 1974/75	694.3	859.1	943.6	741.2	922.9	1,016.0
Replacement in 1974/75	889.0	889.0	889.0	889.0	889.0	889.0
Total gross investment in 1974/75	5,919.7	7,026.0	7,594.7	6,167.4	7,362.5	7,976.6
Increase in foreign-exchange gap	410.0	661.6	790.7	372.0	612.5	735.6
Increase in import surplus with West Pakistan	131.3	209.7	249.8	145.1	228.4	270.8
Increase in total capital inflow	541.3	871.3	1,040.5	517.1	840.9	1,006.4
Total capital inflow as percentage of gross investment in 1974/75	19.3%	20.9%	21.6%	18.1%	19.6%	20.1%
Marginal rate of capital inflow	5.5%	7.3%	7.9%	5.1%	6.8%	7.4%
Marginal rate of regional saving	18.3%	20.3%	21.1%	20.7%	22.9%	23.8%

TABLE IV-A

REDUCTION OF FOREIGN-EXCHANGE GAP BY MORE RAPID IMPORT SUBSTITUTION

	Moderate growth	High growth	Very high growth
Foreign-exchange gap of 1974/75 reduced	38.0	49.1	55.1
Total capital inflow of 1974/75 reduced	24.2	30.4	34.1
Additional lagged investment cost during FFYP	863.2	1172.3	1330.5
Additional income generated during FFYP	301.8	406.7	461.4
Capital cost of unit reduction in foreign-exchange gap in 1974/75	22.716	23.876	24.147
Capital-income ratio for additional income generated	2.860	2.882	2.884
Marginal saving rate changes } from	18.3%	20.3%	21.1%
Marginal saving rate changes } to	20.7%	22.9%	23.8%
Capital-income ratio for new capacity in moderate import-substitution case	1.765	1.764	1.764

TABLE IV-B

REDUCTION OF FOREIGN-EXCHANGE GAP BY MORE RAPID EXPORT EXPANSION

(Additional export expansion of 89.3 million abroad and 25.8 million to West Pakistan in 1974/75)

Additional foreign-exchange requirement in 1974/75	=	24.0
Additional import surplus with West Pakistan in 1974/75	=	5.3
Total additional capital inflow in 1974/75		**29.3**
Net reduction in foreign-exchange gap	=	65.3
Net reduction in capital inflow	=	85.8
Additional investment cost (lagged)	=	343.0
Additional income generated	=	170.3
Capital cost over FFYP of unit reduction in capital inflow	=	3.998
Capital-income ratio for additional income generation	=	2.014

The plan size of the Third Five-Year Plan (TFYP) is, however, at 1964/65 prices and hence comparable with our estimates. The proposed size of East Pakistan's Third Plan was 27 thousand million rupees so that our smallest fourth-plan size is considerably smaller (by about 12 per cent) than the proposed Third Plan while our biggest fourth-plan size is only about 18 per cent higher than the proposed Third Plan. Does it, therefore, indicate that we are aiming for a rather small and unambitious Fourth Plan?

As we take into account the actual performance during the third-plan period, the proposed fourth-plan sizes do not appear particularly unambitious. It seems unlikely that actual investment during the Third Plan will exceed 18 to 20 thousand million rupees at *current* prices[11]. At constant 1964/65 prices they would be smaller, perhaps between 16 and 18 thousand million rupees[12]. Thus, the proposed FFYP sizes would be at least 32 to 77 per cent higher than the actuals during the Third Plan. This means that the biggest ones among the six alternatives would indeed be anything but unambitious and would require quite rapid acceleration in effort.

When one compares our plans with what was originally provided in the Perspective Plan one must of course admit that ours are rather small in comparison. At 1964/65 prices gross investment in 1970, according to the Perspective Plan, is to be 19,180 million rupees for Pakistan as a whole, *i.e.*, at least 9,590 million rupees for East Pakistan[13]. Even our biggest plan gives nearly 17 per cent less investment in 1974/75. But surely the original perspective-plan provisions for 1975 should look overambitious under the changed circumstances of significant shortfall for the Third Plan.

4.4.3 Alternative Rates of Growth and Capital Costs: It has already been stated that for each solution the elasticity of savings (consumption) is greater (less) than one so that the rate of growth in gross regional product (GRP) is greater than the rate of growth in consumption. Moreover, an examination of Table III will show that such elasticity is greater (smaller) the higher the rate of growth in consumption or income. Thus with moderate rate of import substitution a 6-per-cent growth in consumption gives an endogenously determined growth in GRP of 6.5 per cent (elasticity of consumption of 0.92) while a 7.5-per-cent growth in consumption gives a growth in GRP of 8.4 per cent (elasticity of consumption of 0.89).

For the same rate of growth in consumption the elasticity of savings (consumption) is greater (smaller) as the rate of import substitution becomes more

[11]See, *Annual Plan for East Pakistan, 1968-69* [2] for actual investment during 1964/65 through 1967/68 and proposed investment during 1968/69. We assume some rise in 1969/70 over 1968/69.

[12]It should also be pointed out that Plan "investment" includes some non-investment "development expenditure". *See*, the last section.

[13]*See* [9, p. 19].

rapid. Thus, for 7.5-per-cent growth in consumption the moderate import-substitution case gives an 8.4-per-cent growth in GRP (elasticity of consumption of 0.89) while the rapid import-substitution case gives an 8.7-per-cent growth in GRP (elasticity of consumption of 0.86). The explanation of this phenomenon simply lies in the fact that to satisfy a given final demand a greater proportion of the feasible output requirements will have to be produced regionally if import substitution is being driven faster.

It can be seen from Table III that the capital cost of the plan increases only in proportion to the rate of growth in GRP. This is shown by the constancy of the lagged capital-income ratio for new capacity for the same rate of import substitution. In fact, the lagged gross capital-income ratio declines slightly as the rate of growth goes up, the rate of import substitution remaining unchanged. This somewhat peculiar result derives from the particular way we specify the replacement demand for capital. This is done, as detailed in Section 3, by applying certain mortality assumption to the 'past' series of investment leading upto 1973/74. The variations in the growth in investment between 1969/70 and 1973/74 will of course influence the demand for replacement. We have used the same estimate of replacement for all the cases and its actual estimation has been based on the assumption of a somewhat moderate acceleration in investment during 1969/70 through 1973/74. Thus, we probably have understated the replacement demand for the higher growth cases relative to that for the lower growth cases.

While the value of the lagged gross capital-income ratio varies between 2.1 and 2.2 the unlagged capital-income ratio ranges between 2.3 and 2.4. We have already stated that the unlagged capital-income ratio has little analytical meaning but is probably the relevant one for purposes of comparison with the Planning Commission's implicit estimates. Our unlagged overall capital-income ratios for the East Pakistan economy during the Fourth Plan are startlingly similar to the Planning Commission's implicit assumption of such coefficient for the Third Plan[14].

It can be noted that for the rapid import-substitution cases the capital-income ratios are higher than for the corresponding moderate import-substitution cases. This is a feature that we discuss in somewhat greater details later in this section.

4.4.4 Foreign-Exchange Gap and Capital Inflow: Traditionally, East Pakistan has been a highly self-reliant economy. It earned more than half the foreign exchange for Pakistan but used up between a quarter and a third of imports into Pakistan during the sixties. Except in 1963/64 and 1964/65 it has always had a surplus in its trade with rest of the world. In its trade with West

[14]*See*, Khan [13] for an estimate of the third-plan overall capital coefficient for East Pakistan on the basis of the information in Planning Commission [9].

Pakistan, however, it has always shown a deficit which in recent years has reached the level of 500 million rupees. Total capital inflow into East Pakistan in recent years has remained less than 20 per cent of investment and it has almost entirely been in terms of goods and services from West Pakistan and not in terms of 'precious' foreign exchange.

East Pakistan's imports from West Pakistan have mainly consisted of food and other consumer goods. These are the areas in which the region is likely to concentrate heavily its industrialization effort so that the *incremental* share of regional imports of these goods must decline. Acceleration of the development effort in East Pakistan on the other hand will mean a sharp increase in demand for capital goods and related products. In spite of considerable effort at the import substitution of these goods, the incremental share of their imports will remain high by the end of the Fourth Plan. West Pakistan supplies only a very small proportion of these goods and is itself a net importer of these goods in huge quantities. It is, therefore, certain that the acceleration of East Pakistan's development effort during the Fourth Plan will mean a much sharper increase in its foreign-exchange gap as compared to its trade gap with West Pakistan.

As can be seen from Table III East Pakistan's foreign-exchange gap will increase rather sharply — even for moderate import substitution it will go up by 410 million rupees for 6.5-per-cent growth in GRP and by 791 million rupees for 8.4-per-cent growth in GRP. Foreign-exchange gap will increase more than proportionately as income and investment increase.

Trade gap with West Pakistan will also increase and will go up more than proportionately as income and investment go up, but its increase will be more modest — for moderate import-substitution cases it will vary between 131 million and 250 million rupees.

There are two reasons why the capital inflow increases more than proportionately with increases in GRP and investment. First, we have already noticed that the capital goods and the related sectors are highly income elastic. These are also the sectors in which most of the imports are concentrated. Thus, imports increase more than proportionately as GRP increases. Secondly, our exports are exogenously fixed and do not vary with the rate of growth in GRP— probably a not-too-unrealistic assumption.

We do not know the base-year capital inflow into East Pakistan, but assuming that it would be about 600 million rupees (as compared to 370 million rupees in 1965/66 and 504 million rupees in 1966/67) we find that the required capital inflow in 1974/75 will be around 20 per cent of gross investment. This again indicates a lower dependence on foreign resources than has been the characteristic level for Pakistan *as a whole* in the past. This is also within the limits

set in the original Perspective Plan which intended the nation as a whole to have a capital inflow of about 21 per cent of gross investment in 1975[15].

The crucial factor, however, is the rise in East Pakistan's foreign-exchange gap from perhaps almost nothing in the base year to something between 400 and 800 million rupees in 1974/75 depending on the target growth and the intensity of import-substitution effort.

Note, however, that our estimate of the required capital inflow is entirely a measure of the non-competitive import requirement and not a measure of the required addition to domestic savings. The implementation of the required investment programme will necessitate, in addition to the specified quantities of capital inflow, the fulfilment of the savings target which is endogenously given by the model.

One final point needs to be emphasized to forestall the possibility of the misrepresentation of the above analysis. The fact that East Pakistan will have an increasing trade gap (*i.e.*, import surplus) with West Pakistan *does not mean that there will necessarily be a net resource transfer from West to East.* In fact, both the regions will almost certainly remain net importers of foreign capital. One can perhaps talk about the regional shares of foreign assistance but such measurements, to be useful, must be based not only on detailed information about the triangular pattern of trade but also on the correction for the difference between the value of the interregionally traded goods and their value in the international market.

4.4.5 Reducing the Foreign-Exchange Gap: There are two kinds of policies through which attempts can be made to reduce the foreign-exchange gap, import substitution and export expansion. In this subsection we analyse the consequences of each of these alternatives.

Table IV-A quantifies the implications of more rapid import substitution. The meanings of more rapid import substitution and its quantitative measurements have been discussed above in sufficient details. We have argued above that the rapid import-substitution cases probably indicate the limits to feasible import substitution during the FFYP.

By driving the rate of import substitution to its limits we reduce the foreign-exchange gap rather modestly (by 38 million in the moderate-growth case, 49 million in the high-growth case, and 55 million in the very high-growth case). Although the more rapid import substitution means significant reduction in the marginal *share* of imports in the capital goods and related sectors, a part of this is offset by the higher demand for these goods for the required expansion in the regional capacity of these goods. Thus, the overall saving

[15] *See*, [9, p. 19].

in foreign exchange is rather small even though the effort in each of these sectors is rather high. Capital inflow is reduced by even less due to the increase in use-specific complementary regional imports induced by the higher output levels of the using sectors.

Additional income generated is 302 million for the moderate-growth case, 407 million for the high-growth case, and 461 million for the very high-growth case. Additional investment cost is, however, significantly higher than average and has a tendency to increase more than proportionately with additional income generated. It is 863 million, 1172 million and 1331 million respectively. Thus, the capital-income ratio for the additional income generated in the process of more rapid import substitution is very high, 2.9 approximately[16], as compared to the average capital-income ratio for *new capacity* (*i.e.*, net of replacement) of about 1.8 in the three moderate import-substitution cases. The capital cost of reducing foreign-exchange gap is also very high—to reduce the gap in 1974/75 by one rupee, an additional invsetment of 23 to 24 rupees has to be undertaken during the plan period[17].

An additional dimension of the cost involved in reducing the foreign-exchange gap through greater import substitution is the added burden on fiscal policy of diverting to savings the entire additional income generated. Marginal saving rates will have to be between 2.4 and 2.7 percentage points higher.

Thus, we find that the policy of further reducing the foreign-exchange gap by greater import substitution is very expensive in terms of capital. This, however, is what one expects. Further import substitution is possible only in the sectors in which we have significant non-use-specific imports. Such imports are concentrated in the capital goods and related industries. These sectors are much more capital using than the average.

Table IV-B indicates the consequences of reducing the foreign-exchange gap through export promotion *if* exports can be increased across the board by a stipulated amount. The detailed results of additional export expansion of 89.3 million abroad and 25.8 million to West Pakistan have been shown in Appendix Table 17. As discussed earlier this solution is additive to our basic solutions, *i.e.*, we can add it to any of the three moderate import-substitution cases to obtain the corresponding solution for the ambitious export case.

It can be noted from Table IV-B that although exports abroad go up by 89 million, net improvement in foreign-exchange gap amounts to only 65 million. The rest is used up in importing goods required for the production of additional

[16]To be exact for each subsequently higher rate of growth this ratio goes up slightly. *See*, Table IV-A.

[17]Actually the fixed new investment component of it will have to be completed θ years before the end of the FFYP.

outputs directly and indirectly demanded by additional exports. Similarly, net reduction in total capital inflow amounts to only 86 million although total exports abroad and to West Pakistan together increase by 115 million.

Additional income generated is 170 million at an investment cost of 343 million. Thus, the capital-income ratio for the additional income generated by export expansion is just over 2 which is higher than the average capital-income ratio for new capacity for the three moderate import-substitution cases but significantly lower than that for additional income generated by more rapid import substitution. Capital cost of reducing the foreign-exchange gap by one unit is way below such costs involved in the policy of import substitution.

We must, however, emphasize strongly that we do not stipulate that the additional exports would be actually achieved. There are at least two kinds of limitations that our model is unable to take into account. First, the state of world demand will certainly indicate an upper limit for those traditional exports in which our share is big. Secondly, in exporting other goods a number of scarce resources would be required for the marketing effort. Skilled sales representatives is an example. In the short period of five years the supply of such resources may be quite inelastic.

We should finally point out that the costs of export promotion would be sensitive to the composition of exports. We have assumed that exports can be further accelerated almost across the board (with the qualification that for certain traditional exports the prospects are more limited). It may easily be that the feasible exports are more expensive.

4.4.6 Regional Savings in the Alternative Plans: In the base year the average regional saving rate in East Pakistan will probably be around 10 per cent. In view of this the saving targets of the alternative plans may seem to be rather high.

The marginal saving rates are rather sensitive to the rates of growth. For moderate import substitution it ranges from 18.3 per cent for moderate growth to 20.3 per cent for high growth and to 21.1 per cent for very high growth. These rates are also sensitive to the rate of import substitution. For rapid import-substitution cases they are higher, 20.7 per cent, 22.9 per cent, and 23.8 per cent respectively. Thus, the income elasticity of savings ranges from 1.83 (moderate import-substitution, moderate-growth case) to 2.38 (rapid import substitution, very high growth).

Although the alternative plans indicate a rapid expansion in the foreign-exchange gap and capital inflow, the marginal rate of "foreign savings" (*i.e.*, the increase in capital inflow expressed as the ratio of incremental income)

remains small in comparison to the incremental saving rate particularly in the rapid import-substitution cases.

For an economy like East Pakistan the savings targets are certainly ambitious. The size of the capitalist sector is small so that most of the burden will be upon the public sector. It is going to prove an extremely difficult task for the fiscal policy of the government to generate a marginal rate of saving more than twice as high as the average rate. This may be an important consideration in favour of preferring the moderate import-substitution alternatives which have significantly lower marginal saving rates than the rapid import-substitution alternatives.

4.5 Implications for Additional Employment

It remains for us to estimate for the alternative solutions the additional employment that will be generated. This we do by applying the labour-requirement coefficients for a past period to the sectoral additions to value added.

Labour inputs (in man-years) per unit of value added have been calculated for the manufacturing industries on the basis of *1962/63 Census of Manufacturing Industries* [5] and *1963/64 Survey of Small Industries* [4]. Such coefficients for the services sectors have been estimated by combining the information on the occupational distribution in the 1961 Census [11] and the components of national income reported in the National Income Commission's *Report* [7].

We do not try to estimate such coefficients for the agricultural sectors. This is because agriculture is at the moment the residual employment category and believed to contain a large amount of underemployment. An increase in agricultural employment at present will almost certainly increase the extent of underemployment during most of the year.

Appendix Table 18 shows the employment implications of the two very high-growth cases. It can be seen that for moderate import-substitution employment will increase by about 2.4 million and for rapid import substitution by 2.5 million[18]. Projections for additions to total labour supply have not been done in the light of the latest information on birth and death rates. Estimates done by Bose [1] several years ago indicate an increase in labour supply over the FFYP of about 3.2 million. On the basis of the latest population projections, this estimate appears to be an understatement if anything. Thus, the nonagricultural employment creation under the most ambitious of our plans would absorb no more than 75 to 78 per cent of the additional labour force under most favourable assumptions.

[18]There will probably be another few thousand additional employment in the processing of agricultural goods.

Once we allow for the facts that *a*) the projected increase in labour supply is almost certainly an understatement and that *b*) the use of the labour-coefficients of nearly a decade ago leads to an overestimate in employment since some increase in labour productivity would be inevitable particularly in the services sectors, it would appear that the additional nonagricultural employment during the FFYP would be a much smaller proportion of the increased labour supply — perhaps between a half and two-thirds.

The shares of manufacturing and construction will each be roughly a quarter of the additional employment. It may be noted that half of the additional employment will be in services, *i.e.*, in trade, transport, government and miscellaneous services. Particularly large is the share of miscellaneous services, a quarter of total additional employment. This makes us wonder how effective this employment would be. Almost certainly the labour-coefficient for this sector includes a significant degree of underemployment. This is also supported by the evidence of very low labour productivity indicated by the labour-coefficient of this sector.

It may, however, be noted that even after the corrections for the possible overestimates in employment creation the two plans would indicate very large percentage increase in nonagricultural labour force — certainly well over 50 per cent. This would also mean a much higher marginal share of nonagricultural employment than average (the average share according to 1961 Census was only 15 per cent). While between the 1951 and 1961 Censuses the share of non-agricultural employment actually declined, the two plans under review will result in an increase in such share. But not only the prospect of absolute transfer of labour from agriculture to nonagriculture will remain an illusion, there will actually be an absolute increase in agricultural labour force and underemployment.

4.6. Some Concluding Remarks

In the above we have derived a number of alternative plans. Each of the plans indicates a given size in terms of actual total investment to be undertaken during the FFYP. It should be emphasized that our "plan size" in terms of total gross investment is not quite comparable to the plan size as indicated in the plan documents prepared by the Planning Commission. There are two main discrepancies: *a*) plan documents are presumably formulated in the prices of the plan base-years[19] while our estimates are in the prices of the base-year of the previous plan; and *b*) the Planning Commission's definition of plan cost includes certain non-investment development expenditures.

[19] The plan document is actually prepared long before the base-year of the Plan is over. Thus, in using the base-year prices there is always a problem of price prediction. How this is done in practice has remained a minor mystery surrounding the planning process in the country.

Thus, in order to compare our results with the forthcoming FFYP document of the Planning Commission, one must make adjustments for the above factors. To make these accurately, one would be required to undertake great pains. *Very roughly*, a price index for investment for the year 1969/70 of about 115 is indicated (with that for our base, 1964/65 = 100) if trends since 1964/65 are maintained in near future. It is also very difficult to estimate the volume of non-investment development expenditure, but 5 per cent of the value of investment may indicate the order of magnitude.

Thus, in order to convert our plan sizes into the value units of the Planning Commission's forthcoming FFYP size, an upward adjustment of *roughly* 20 per cent will have to be made. This means that for the very high-growth cases the fourth-plan sizes in terms of the Planning Commission's value units would be approximately 36.4 thousand million (moderate import-substitution case) and 38.2 thousand million (rapid import-substitution case).

In the present exercise we have worked out a number of alternative feasible plans although we have not discussed anything about the criteria of selecting a plan from the alternative blueprints. Such choice must ultimately depend upon the political process. But a number of considerations clearly rule out all but the most ambitious of the alternatives explored.

It is true that the very high-growth alternatives present a highly optimistic picture in terms of growth of regional product. Even with the 3-per-cent rate of growth of population, that is being currently forecast, these alternatives would provide over 5 per cent annual growth in income per head—a highly favourable performance compared to almost any developing country today. But from another important standpoint even this rate of growth is hardly enough. East Pakistan is one of the poorest countries of the world with one of the highest population densities and one of the smallest nonagricultural sectors in terms of shares of employment and output. Consequently, underemployment and unemployment in agriculture, actual and potential, are staggering. It is highly desirable that most, if not all, of the additions to labour force be absorbed in nonagricultural employment. As we have shown above, even these very high-growth alternatives are unlikely to absorb more than two-thirds of the additional labour force in nonagricultural employment during the FFYP.

Another consideration is the likely size of the national plan and the notion of what is an appropriate share of East Pakistan. In spite of the frequently mentioned "unfavourable aid climate", the size of Pakistan's Fourth Plan should be greater than the *planned* size of the preceding plan to avoid demoralization and to demonstrate self-reliance. Even a modest increase of about 15 per cent in *real terms* over the Third Plan would indicate a fourth-plan size of over 70 thousand million in current prices. In the past, a national concensus was reached that a higher growth rate in East Pakistan relative to that in

West should be maintained until the living standards in the two regions were equalised. Accordingly, in formulating the third-plan allocation East's share was proposed to be more than half. Unfortunately, preliminary estimates suggest that East's actual share is unlikely to be anything like its planned share which only underlines the need to pursue this objective even more vigorously in near future. If the capital-income ratio is lower in East Pakistan than in West (as the Planning Commission's estimates underlying the Third Plan seem to indicate) then it is an additional argument for (not an argument against) the concentration of investment in the East because the objective of national efficiency will then be fully consistent with the objective of interregional equity. Thus, given a national plan of over 70 thousand million rupees at current prices, a share of 36 to 38 thousand million rupees for East Pakistan would appear to be the minimum desirable. These are the sizes of the very high-growth alternatives.

One of the startlingly optimistic results of the present set of exercises is the low capital cost of generating income in East Pakistan. Although nothing in East Pakistan's past performance contradicts this optimism, it is important to recognise that the low capital-income ratio derives largely from the fact that the incremental share of agriculture (though much smaller than the average share) would remain large in incremental GRP. Although our incremental capital and modern input coefficients for agriculture have been estimated to be much higher than average coefficients to reflect the increasing costs at the margin, the direct and indirect capital requirements remain lower for these sectors than for the rest of the economy.

The low capital-income ratio for the economy, therefore, is crucially dependent on the success of the agricultural programme. The model admittedly does not take into account all possible constraints in this sector. Extension has been treated as part of public administration. The burden on it may turn out to be too great. There are institutional factors obstructing the rate of adoption of new techniques. Large-scale efforts will be needed to remove these through the provision of credit and cooperative arrangements. It may not be feasible to drive such programmes at the required rates. The consequence will be a smaller relative expansion in agriculture and a less favourable capital-income ratio for the economy of the region.

The present exercises have not incorporated the flood-control programme partly because technical details were not available and partly because no decisions were known to have been made by the planning authorities about the magnitude and the phasing of such a programme. It may turn out that some amount of flood-control work will become inevitable during the Fourth Plan. This will raise the plan cost. However, a preliminary exercise reported in [14] indicates that the direct capital cost of such a programme is unlikely to be very large. A more important problem is to finance the consumption of the additional labour force employed in flood-control work either by producing more

consumption goods (which will require additional investment) or by redistributing the present consumption bundle through taxation and other means (which will require no additional investment but will increase the required marginal saving rate thereby putting additional strain on fiscal mechanism).

The exercises also assume that self-sufficiency in rice will be achieved by the end of the Third Plan. If this does not prove true, then either additional agricultural investment will have to be undertaken during the Fourth Plan or additional foreign exchange will have to be provided for the import of rice. The detailed implications of such a possibility have been worked out in [14].

REFERENCES

1. Bose, Swadesh R., "Labour Force and Employment in Pakistan, 1961-86: A Preliminary Analysis", *Pakistan Development Review*, Vol. III, No. 3, Autumn 1963.

2. East Pakistan, Planning Department, *Annual Plan for East Pakistan for 1968-69*. (Dacca: Planning Department, 1968).

3. East Pakistan, Planning Department, *Economic Survey of East Pakistan, 1967-68*. (Dacca: Planning Department, 1968).

4. East Pakistan, Small Industries Corporation, *The Survey of Small Industries*. (Dacca: Small Industries Corporation, 1964).

5. East Pakistan, Bureau of Statistics, *Census of Manufacturing Industries in East Pakistan, 1962-63*, Volumes I—V. (Dacca: Bureau of Statistics, 1967).

6. Pakistan, Central Statistical Office, *Quarterly Survey of Current Economic Conditions, 1963/64*. (Karachi: Central Statistical Office).

7. Pakistan, Central Statistical Office, *Final Report of the National Income Commission*. (Karachi: Central Statistical Office, November 1965).

8. Pakistan, Planning Commission, *Report of the Consistency Committee*. (Karachi: Manager of Publications, 1965).

9. Pakistan, Planning Commission, *The Third Five-Year Plan*. (Karachi: Manager of Publications, June 1965).

10. Pakistan, Planning Commission, *The Mid-Plan Review of the Third Five-Year Plan.* (Karachi: Manager of Publications, April 1968).

11. Pakistan, Population Census Commission, *The Census of Pakistan, 1961,* Vol. IV. (Karachi: Manager of Publications).

12. East Pakistan, *Programme for Attainment of Self-Sufficiency in Food Production in East Pakistan by 1969-70.* (Dacca: Government Printing Press, 1967).

13. Khan, Azizur Rahman, *Planning and Regional Development.* Ph. D. thesis at the University of Cambridge, 1966.

14. Khan, Azizur Rahman, *Possibilities of the East Pakistan Economy during the Fourth Five-Year Plan: A Report on the Application of a Multisectoral Planning Model to East Pakistan's Fourth Plan.* (Karachi: Pakistan Institute of Development Economics, December 1968).

15. Khan, Azizur Rahman and Arthur MacEwan, *Regional Current Input-Output Tables for East and West Pakistan Economies.* Mimeographed Research Report No. 63. (Karachi: Pakistan Institute of Development Economics).

16. Khan, Azizur Rahman and Arthur MacEwan, "A Multisectoral Analysis of Capital Requirements for Development Planning in Pakistan", *Pakistan Development Review,* Vol. VII, Winter 1967.

17. Khan, Azizur Rahman, *A Multisectoral Analysis of Personal Consumption Behaviour.* Mimeographed. (Karachi: Pakistan Institute of Development Economics, 1968).

18. MacEwan, Arthur, *Development Alternatives for Pakistan.* Ph.D. thesis at the Harvard University, 1968.

19. Manne, Alan, "Key Sectors of the Mexican Economy, 1960-1970", Chapter XVI in A.S. Manne and H. Markowitz (eds.), *Studies in Process Analysis.* (New York: 1963).

20. Manne, Alan and Ashok Rudra, "A Consistency Model for India's Fourth Five-Year Plan", *Sankhya,* Series B, 1965.

21. Manne, Alan and Tom Weisskopf, *A Dynamic Multisectoral Programming Model for India,* (Statistical Appendix). (Indian Statistical Institute, 1967).

22. National Planning Association, *Capacity Expansion Factors (Manufacturing Industries).* (Washington, D.C: National Planning Association).

23. Raisuddin, *Benchmark Estimates of Agricultural Production in East Pakistan.* Mimeographed. (Dacca: Planning Department, 1968).

24. Sandee, Jan, *A Demonstration Planning Model for India.* (Calcutta: Asia Publishing House, 1960).

Appendix Tables

TABLE 1

INCREMENTAL CURRENT INPUT COEFFICIENTS MATRIX

	1	2	3	4	5	6	7
1	.02238	0	0	.09162	0	0	0
2	0	.01319	0	0	0	0	0
3	0	0	.01726	0	0	0	0
4	.07130	.05087	.02275	.02370	.54828	.36503	.26485
5	0	0	0	0	0	0	0
6	0	0	0	0	0	.10383	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	.00282	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	.00033	0	0	0	.00149	.00674	.01035
13	0	0	0	0	0	0	0
14	.10883	.00190	.00559	.00228	0	0	0
15	.03585	.00070	.00267	.00080	.00281	.00080	.00878
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	.00909
18	0	0	0	0	0	.01595	0
19	.00450	.00179	.00052	.00096	0	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	.00009	0	0	0	0	0	.00102
23	.00848	0	0	0	0	.00425	.00295
24	.00093	0	0	0	.01161	.00373	.00070
25	.03000	.03044	.02448	.03492	.06618	.02134	.02375
26	.04000	.08782	.09489	.07025	.05221	.08678	.13071
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	.00040	.00143	.01085	.00014	.01317	.00283	.00191

(*continued*)

TABLE 1—*Contd.*

INCREMENTAL CURRENT INPUT COEFFICIENTS MATRIX

	8	9	10	11	12	13	14
1	0	0	0	0	0	0	0
2	0	0	.34519	0	0	0	0
3	0	0	0	0	0	0	0
4	.23983	.28329	0	.00069	.09500	.32276	.01121
5	.08654	0	0	0	0	0	0
6	.03042	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	.00738	0	0	0	0	.00767	0
9	0	.10963	0	.19851	0	.00638	0
10	.03621	.00135	0	.01315	0	0	.05342
11	0	.02581	0	.31098	0	.00230	0
12	.03036	.00202	.00207	.00133	.21062	0	0
13	0	0	0	.00026	0	.11225	0
14	0	0	0	0	0	0	0
15	.02542	.01338	.00953	.03385	.09545	.09448	.01737
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	.02660	0	0	0	.00642	.01200	0
19	0	.00241	.00848	.00272	.00158	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	.00491	.03362	.00047	0	.00880	.05429	.02545
23	.00798	.01138	.00794	.04987	.05083	.01312	.04584
24	.00422	.02987	.01933	.00242	.12050	.00968	.10393
25	.01591	.02567	.02082	.00738	.04215	.03593	.04809
26	.07029	.09119	.06922	.07451	.10411	.14305	.10758
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	.00210	.01250	.00874	.00406	.01089	.01098	.02991

(*continued*)

TABLE 1—*Contd.*

INCREMENTAL CURRENT INPUT COEFFICIENTS MATRIX

15	16	17	18	19	20	21
0	0	0	0	0	0	.02266
0	0	0	0	0	0	0
0	0	0	0	0	0	0
.02849	0	0	.00626	0	.00307	.06980
.00117	0	0	0	0	0	0
.02273	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	.00792	0	0	0
0	.10909	0	0	0	.00493	0
0	0	0	0	0	0	0
.01709	0	.00248	.00156	0	0	0
0	0	0	.01133	0	.04371	0
0	0	0	0	0	0	0
.11582	0	.00261	.03054	.01309	.00777	.02163
0	0	0	0	0	0	.05000
0	0	.42689	.39302	.20000	.03421	.06320
.00191	0	.01533	.02660	.00851	.00798	.03811
.00284	.01087	.00250	.00546	.05580	.08912	.01298
0	0	0	0	0	.18882	0
0	0	0	0	0	0	0
.04655	.08400	.00123	.00121	.02028	.00656	.13004
.01289	.09716	.02020	.01223	.04623	.00821	.00281
.00323	.10135	.01170	.00540	.00661	.00913	0
.01929	.16033	.05199	.03251	.04365	.04302	0
.12452	.05151	.09273	.09458	.13823	.14421	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
.00954	.01648	.01515	.00913	.01438	.00553	.00074

(*continued*)

TABLE 1—*Concld.*

INCREMENTAL CURRENT INPUT COEFFICIENTS MATRIX

	22	23	24	25	26	27	28	29
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	.11356	0	0	.00601	0	0	.00267	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	.00317	0	0	0	0	0	0	0
9	.02320	0	0	0	0	0	0	0
10	0	0	0	.00441	0	0	0	0
11	.02137	0	0	0	0	0	.00017	0
12	.00273	0	.00403	.00209	.00049	0	.00661	.00448
13	0	0	0	.00575	0	0	0	0
14	0	0	0	0	0	0	0	0
15	.04319	.01048	0	0	0	0	.00243	.00079
16	0	0	0	0	0	0	0	0
17	.01078	0	0	0	0	0	0	0
18	.02385	.05482	0	.00525	.00232	0	.00087	.00010
19	.02527	0	.01626	0	0	0	.00031	.00097
20	0	0	0	.00670	0	0	0	0
21	0	0	0	0	0	.29392	0	0
22	.04615	0	0	.00311	.00108	0	.00153	.00159
23	.01108	.30000	.16658	.03471	0	0	.01052	0
24	.00701	.01011	.05588	.00209	.00188	0	.02403	.00246
25	.05761	.07844	0	0	0	0	.08784	0
26	.11822	.10269	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	.00532	0	0	.00184	.00503	.00724	.02381	.00130

TABLE 2

INCREMENTAL FIXED CAPITAL COEFFICIENTS MATRIX

	1	2	3	4	5	6	7	8
18	.001	.002	.012	0	.010	.001	.003	.005
19	.242	.143	.345	.068	.596	.133	.121	.245
20	0	0	.006	0	.020	.002	.006	.009
21	.124	.230	.204	.080	.162	.073	.117	.179
22	.002	.002	.013	0	.010	.002	.003	.005

(contd.)

	9	10	11	12	13	14	15	16
18	.002	.005	.001	.034	.004	.005	.009	.009
19	.381	.928	.174	.863	.201	1.719	.282	2.129
20	.005	.006	.002	.067	.009	.009	.019	.018
21	.158	.399	.065	.380	.119	.201	.367	.358
22	.003	.006	.001	.035	.005	.005	.010	.009

(contd.)

	17	18	19	20	21	22	23	24
18	.027	.004	.014	.023	0	.007	.014	0
19	1.285	.243	.889	.392	.037	.399	.862	3.498
20	.054	.007	.027	.043	.075	.013	.018	0
21	.873	.207	.705	.765	.038	.298	.309	2.332
22	.027	.005	.014	.024	0	.007	.014	0

(contd.)

	25	26	27	28	29
18	.003	.020	0	.014	.013
19	.039	.199	0	.159	.198
20	.949	.043	0	.034	.042
21	1.206	1.137	6.000	.907	1.132
22	.002	.023	.0	.020	.030

TABLE 3

INCREMENTAL WORKING CAPITAL COEFFICIENTS

	1	2	3	4	5	6	7
1	.12500	0	0	.02164	0	0	0
2	0	.21549	0	0	0	0	0
3	0	0	.20460	0	0	0	0
4	.00143	0	0	.15271	.02700	.12210	.12889
5	0	0	0	0	.45200	0	0
6	0	0	0	0	0	.23365	0
7	0	0	0	0	0	0	.20000
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	.00028	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	0	0	0	0	0	.00165	.00530
13	0	0	0	0	0	0	0
14	.01088	.00217	.00130	.00016	0	0	0
15	.00359	.00080	.00062	.00006	0	0	.00400
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	.00711
18	0	0	0	0	0	.00495	0
19	.00045	.00211	.00014	.00022	0	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	0	0	0	0	0	0	.00051
23	.00085	0	0	0	0	.00165	.00158
24	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0

(continued)

TABLE 3—*Contd.*

INCREMENTAL WORKING CAPITAL COEFFICIENTS

	8	9	10	11	12	13	14
1	0	0	0	0	0	0	0
2	0	0	.11040	0	0	0	0
3	0	0	0	0	0	0	0
4	.03552	.08791	0	0	.04891	.05460	.00878
5	.01258	0	0	0	0	0	0
6	.00444	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	.32874	0	0	0	0	.00105	0
9	0	.29527	0	.05120	0	.00105	0
10	.00518	0	.26500	.00320	0	0	.04631
11	0	.00745	0	.32460	0	0	0
12	.00444	0	.00120	0	.22300	0	0
13	0	0	0	0	0	.25590	0
14	0	0	0	0	0	0	.22300
15	0	.00447	.00360	.00960	.04618	.01575	.01306
16	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0
18	0	0	0	0	.00315	.00210	0
19	0	0	.00240	0	.00082	0	0
20	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0
22	0	.01043	0	0	.00467	.00945	.02033
23	0	.00298	.00240	.01280	.02871	.00210	.03817
24	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0

(*continued*)

TABLE 3—*Contd.*

INCREMENTAL WORKING CAPITAL COEFFICIENTS

	15	16	17	18	19	20	21
1	0	0	0	0	0	0	.00567
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	.01188	.01123	0	.00330	0	0	.01745
5	0	0	0	0	0	0	0
6	.00972	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	.00660	0	0	0
10	0	.05014	0	0	0	.00292	0
11	0	0	0	0	0	0	0
12	.00756	0	.00199	0	0	0	0
13	0	0	0	.00660	0	.03212	0
14	0	0	0	0	0	0	0
15	.31168	0	.00199	.01980	.00996	.00584	.00541
16	0	.22000	0	0	0	0	.01250
17	0	0	.51509	.26070	.13695	.02628	.01580
18	0	0	.00597	.28950	.00747	.00584	.00953
19	.00108	.00452	.00199	.00330	.32182	.06716	.00325
20	0	0	0	0	0	.44016	0
21	0	0	0	0	0	0	0
22	.02052	.03545	0	0	.01494	.00584	.03251
23	.00540	.04283	.00796	.00660	.03735	.00730	.00070
24	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0

(*continued*)

TABLE 3—*Concld.*

INCREMENTAL WORKING CAPITAL COEFFICIENTS

	22	23	24	25	26	27	28	29
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	.02271	0	0	0	0	0	.00040	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	.00063	0	0	0	0	0	0	0
9	.00464	0	0	0	0	0	0	0
10	0	0	0	.00103	0	0	0	0
11	.00427	0	0	0	0	0	0	0
12	.00055	0	.00150	.00037	0	0	.00116	.00078
13	0	0	0	.00030	0	0	0	0
14	0	0	0	0	0	0	0	0
15	.00864	.00157	0	0	0	0	.00029	.00009
16	0	0	0	0	0	0	0	0
17	.00216	0	0	0	0	0	0	0
18	.00477	.00822	0	.00066	.00029	0	.00011	0
19	.00505	0	.00574	0	0	0	.00005	.00015
20	0	0	0	.00232	0	0	0	0
21	0	0	0	0	0	0	0	0
22	.23123	0	0	.00052	.00018	0	.00025	.00026
23	.00222	.17000	.06630	.00694	0	0	.00210	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0

TABLE 4

FOREIGN IMPORT COEFFICIENTS MATRIX

Supplying sector	Using sector	Moderate import substitution	Rapid import substitution
04	04	.02500	.02500
04	09	.04000	.04000
04	22	.02240	.02240
06	06	.03500	.03500
09	09	.02874	.02874
11	11	.06000	.06000
12	12	.12000	.12000
13	13	.10000	.10000
13	25	.00300	.00300
14	14	.15000	.15000
15	15	.42900	.28743
16	16	.66700	.66700
17	17	1.20000	1.00000
18	18	.10900	.07000
19	19	1.50000	1.00000
20	20	.66700	.44689
22	22	.10000	.10000
23	23	2.30000	1.30000

TABLE 5

REGIONAL IMPORT COEFFICIENTS MATRIX

Supplying sector	Using sector	
04	04	.03000
04	07	.14240
04	09	.18384
06	06	.02500
07	07	.10000
08	08	.02000
09	09	.11100
13	13	.10000
15	15	.06500
16	16	.33300
19	19	.05000
20	20	.05000
22	22	.10000

TABLE 6

Sectors	MCP*	(*c.i.f. Price/Purch. Price Ratio*)	
		Foreign import	Regional import
1	.230	.667	.605
2	—	—	—
3	.008	—	—
4	.210	.715	.690
5	.020	—	—
6	.026	.485	.835
7	.039	.222	.860
8	.030	.370	.695
9	.051	.602	.915
10	—	—	—
11	.023	.303	.914
12	.012	.516	.875
13	.016	.400	.860
14	—	.878	—
15	.036	.550	.874
16	—	.541	.833
17	—	.568	.865
18	.011	.513	.863
19	.016	.523	.905
20	.002	.529	.885
21	—	—	—
22	.028	.400	.885
23	.009	.483	—
24	.005	—	—
25	.037	—	—
26	—	—	—
27	.080	—	—
28	—	—	—
29	.111	—	—

*Marginal consumption proportion.

TABLE 7

The following are the transport and trade coefficients $\sum_i t_{ij}\, m_{ij}$ for all the import "using" sectors for inputs of transport and trade on foreign and regional imports together

Sector	Transport	Trade
4	.00140	.01290
6	.00775	.09683
7	.00626	.05176
8	.00060	.00550
9	.00894	.06761
11	.00060	.00852
12	.00252	.00804
13	.00760	.05070
14	.01530	.00300
15	.00988 (.00705)	.09484 (.06581)
16	.03762 (.07638)	.01782 (.03618)
17	.07800 (.06500)	.32400 (.27000)
18	.00436 (.00280)	.01177 (.00756)
19	.07725 (.05225)	.07750 (.05250)
20	.03093 (.02147)	.06153 (.04238)
22	.00545	.04253
23	.18400 (.10400)	.37260 (.21060)
25	.00047	.00529

Note: The figures in parentheses refer to the changed coefficients for the rapid import substitution cases.

TABLE 8

BASE-YEAR INVESTMENT
(1964/65 Prices)

(*million rupees*)

Sector	Fixed capital for new capacity	Working capital	Replcaement
1		84.1	
2		20.5	
3		0.9	
4		45.1	
5		30.5	
6		14.4	
7		11.0	
8		1.0	
9		37.0	
10		33.2	
11		20.4	
12		1.0	
13		5.8	
14		25.1	
15		14.9	
16		2.1	
17		30.4	
18	27.5	7.6	
19	632.0	6.6	200.0
20	270.0	9.6	158.0
21	1173.0	—	293.0
22	22.5	13.2	
23		9.2	
24			
25			
26			
27			
28			
29			

TABLE 9

INCREASES OVER THE FOURTH PLAN IN EXPORT REPLACEMENT, *ETC.*

(*million rupees*)

Sector	Normal projection		Replacement	Exogenous import		Trade & transport input on exogenous import*
	Foreign exports	Regional exports		Foreign	Regional	
1. Rice growing and processing						
2. Jute growing and baling	42.5	7.4				
3. Tea		68.5		0.8		
4. All other crops, fishery *etc.*	15.0	5.0		7.0	6.2	
5. Sugar						
6. Edible oils						
7. Cigarettes and tobacco products						
8. Misc. food and drinks	10.0					
9. Cotton textiles	5.0	5.0				
10. Jute textiles	260.0	52.0				
11. Other textiles	5.0	6.0		1.5	2.3	
12. Paper and printing		30.0		2.3	0.8	
13. Leather aud rubber products	25.0	5.0		1.5		
14. Fertilizer						
15. Chemicals		10.0				
16. Cement						
17. Basic metals						
18. Metal products						
19. Machineries			73.0			
20. Transport equipment			60.0			
21. Construction			105.0			
22. Misc. manufactures	15.0	15.0				
23. Coal aud petroleum						
24. Electricity & gas						
25. Transport						0.6 (0.7) (.08)
26. Trade						5.0 (6.0) (6.5)
27. Housing						
28. Government						
29. Miscellaneous services						
TOTAL:	377.5	203.9	238.0	13.1	9.3	5.6

*Medium growth, high growth and very high growth respectively.

TABLE 10

CONSUMPTION VECTORS: INCREASES OVER FFYP

(*million rupees*)

Supplying sector	Moderate growth	High growth	Very high growth
1	1768.7	2114.1	2290.6
2	—	—	—
3	61.5	73.5	79.7
4	1614.9	1930.3	2091.5
5	153.8	183.8	199.2
6	199.9	239.0	258.9
7	299.9	358.5	388.4
8	230.7	275.8	298.8
9	392.2	468.8	507.9
10	—	—	—
11	176.9	211.4	229.1
12	92.3	110.3	119.5
13	123.0	147.1	159.3
14	—	—	—
15	276.8	330.9	358.5
16	—	—	—
17	—	—	—
18	84.6	101.1	109.6
19	123.0	147.1	159.3
20	30.8	36.8	39.8
21	—	—	—
22	215.3	257.4	278.9
23	69.2	82.7	89.6
24	38.4	46.0	49.8
25	284.5	340.1	368.5
26	—	—	—
27	615.2	735.3	796.7
28	359.8*	388.9*	408.4*
29	838.2	1001.8	1085.7

*Public consumption expenditure.

TABLE 11

MODERATE IMPORT SUBSTITUTION, MODERATE GROWTH

(million rupees)

Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1. Rice growing and processing	2071.2	1396.2	764.3	295.1
2. Jute growing and baling	169.6	137.7	63.9	37.4
3. Tea	137.9	113.2	80.0	28.5
4. All other major and minor crops, livestock, forestry and fishery	2363.4	1832.4	349.8	413.1
5. Sugar	166.3	50.6	132.7	79.7
6. Edible oils	226.9	88.2	47.9	82.6
7. Cigarettes and tobacco products	275.4	150.3	68.9	95.7
8. Miscellaneous food and drinks	261.1	107.5	115.7	102.1
9. Cotton textiles	461.4	165.1	253.3	188.5
10. Jute textiles	344.9	175.3	463.5	132.8
11. Other textiles	283.0	85.0	68.8	113.6
12. Paper and printing	179.9	45.6	248.1	63.9
13. Leather and rubber products	150.7	26.4	50.9	51.5
14. Fertilizer	194.6	108.4	377.3	68.0
15. Chemicals	386.5	229.6	265.5	142.2
16. Cement	50.0	18.5	126.2	18.2
17. Basic metals	170.8	61.0	387.0	91.4
18. Metal products	193.2	70.0	90.0	115.2
19. Machineries	360.6	163.4	594.6	190.6
20. Transport equipment	74.3	30.0	92.7	44.1
21. Construction	1866.5	1097.6	280.0	191.9
22. Miscellaneous manufactures	523.3	255.1	378.9	150.1
23. Coal and petroleum	79.8	35.4	97.1	14.3
24. Electricity and gas	148.3	112.3	864.6	10.9
25. Transport	709.3	658.3	1559.8	8.6
26. Trade	1020.2	1009.2	1450.7	0.5
27. Housing	615.2	429.9	3691.2	—
28. Government	359.8	301.9	408.0	1.6
29. Miscellaneous services	903.6	893.0	1278.6	1.2
TOTAL:		9847.1	14650.0	2733.3

TABLE 12

MODERATE IMPORT SUBSTITUTION, HIGH GROWTH

(million rupees)

Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1. Rice growing and processing	2502.8	1687.1	923.5	356.6
2. Jute growing and baling	174.0	141.3	65.6	38.4
3. Tea	150.6	123.6	87.3	31.1
4. All other major and minor crops, livestock, forestry and fishery	2857.2	2215.3	422.9	499.4
5. Sugar	205.3	62.5	163.8	98.3
6. Edible oils	274.6	106.7	57.9	100.0
7. Cigarettes and tobacco products	331.2	180.8	82.8	115.1
8. Miscellaneous food and drinks	310.4	127.8	137.5	121.3
9. Cotton textiles	559.0	200.1	306.9	228.4
10. Jute textiles	355.7	180.8	478.1	136.9
11. Other textiles	342.4	102.8	83.2	137.4
12. Paper and printing	208.4	52.9	287.4	74.1
13. Leather and rubber products	177.9	31.2	60.1	60.8
14. Fertilizer	239.8	133.6	465.0	83.8
15. Chemicals	470.1	279.2	323.0	172.9
16. Cement	66.8	24.7	168.5	24.3
17. Basic metals	234.3	83.7	530.9	125.3
18. Metal products	251.5	91.1	117.2	150.0
19. Machineries	496.0	224.8	817.9	262.1
20. Transport equipment	127.7	51.6	159.2	75.8
21. Construction	2482.6	1459.8	372.4	255.3
22. Miscellaneous manufactures	662.2	322.8	479.4	190.0
23. Coal and petroleum	98.5	43.7	119.9	17.7
24. Electricity and gas	178.0	134.8	1037.7	13.1
25. Transport	865.0	802.8	1902.1	10.5
26. Trade	1264.2	1250.5	1797.7	0.6
27. Housing	735.3	513.9	4411.8	—
28. Government	388.9	326.4	441.0	1.7
29. Miscellaneous services	1081.3	1068.7	1530.0	1.4
TOTAL:		12025.0	17830.7	3382.4

TABLE 13

MODERATE IMPORT SUBSTITUTION, VERY HIGH GROWTH

(million rupees)

	Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1.	Rice growing and processing	2723.4	1835.8	1004.9	388.0
2.	Jute growing and baling	176.2	143.0	66.4	38.9
3.	Tea	157.2	129.0	91.2	32.5
4.	All other major and minor crops, livestock, forestry and fishery	3109.7	2411.0	460.2	543.5
5.	Sugar	225.3	68.5	179.8	107.9
6.	Edible oils	298.8	116.1	63.0	108.8
7.	Cigarettes and tobacco products	359.7	196.4	89.9	125.0
8.	Miscellaneous food and drinks	335.5	138.2	148.6	131.1
9.	Cotton textiles	609.0	217.9	334.3	248.8
10.	Jute textiles	361.2	183.6	485.5	139.1
11.	Other textiles	372.9	112.0	90.6	149.7
12.	Paper and printing	223.1	56.6	307.7	79.3
13.	Leather and rubber products	191.6	33.6	64.8	65.5
14.	Fertilizer	262.8	146.4	509.6	91.9
15.	Chemicals	512.8	304.6	352.3	188.6
16.	Cement	75.5	27.9	190.5	27.5
17.	Basic metals	266.9	95.3	604.8	142.8
18.	Metal products	281.4	101.9	131.1	167.8
19.	Machineries	565.5	256.3	932.5	298.9
20.	Transport equipment	155.2	62.7	193.5	92.1
21.	Construction	2799.4	1646.1	419.9	287.8
22.	Miscellaneous manufactures	733.4	357.5	531.0	210.4
23.	Coal and petroleum	108.1	47.9	131.6	19.4
24.	Electricity and gas	193.3	146.4	1126.9	14.2
25.	Transport	945.0	877.0	2078.1	11.5
26.	Trade	1389.2	1374.2	1975.4	0.7
27.	Housing	796.7	556.8	4780.2	—
28.	Government	408.4	342.7	463.1	1.8
29.	Miscellaneous services	1172.5	1158.8	1659.1	1.4
	TOTAL:		13144.2	19466.5	3714.9

TABLE 14

RAPID IMPORT SUBSTITUTION, MODERATE GROWTH

(million rupees)

Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1. Rice growing and processing	2074.8	1398.6	765.6	295.6
2. Jute growing and baling	169.9	137.9	64.1	37.5
3. Tea	137.9	113.2	80.0	28.5
4. All other major and minor crops, livestock, forestry and fishery	2375.9	1842.1	351.6	415.3
5. Sugar	166.4	50.6	132.8	79.7
6. Edible oils	228.4	88.8	48.2	83.1
7. Cigarettes and tobacco products	275.4	150.3	68.9	95.7
8. Miscellaneous food and drinks	261.2	107.6	115.7	102.1
9. Cotton textiles	462.3	165.4	253.8	188.9
10. Jute textiles	345.5	175.6	464.4	133.0
11. Other textiles	283.7	85.2	68.9	113.9
12. Paper and printing	181.5	46.0	250.3	64.5
13. Leather and rubber products	152.2	26.7	51.4	52.1
14. Fertilizer	195.0	108.7	378.1	68.2
15. Chemicals	440.2	261.4	302.4	161.9
16. Cement	52.5	19.4	132.5	19.1
17. Basic metals	229.7	82.0	520.5	122.9
18. Metal products	213.3	77.3	99.4	127.2
19. Machineries	507.0	229.8	836.0	267.9
20. Transport equipment	97.1	39.2	121.1	57.6
21. Construction	1957.6	1151.1	293.6	201.3
22. Miscellaneous manufactures	543.1	264.8	393.2	155.8
23. Coal and petroleum	127.2	56.4	154.8	22.9
24. Electricity and gas	152.0	115.1	886.2	11.2
25. Transport	727.4	675.1	1599.6	8.8
26. Trade	1062.9	1051.4	1511.4	0.5
27. Housing	615.2	429.9	3691.2	—
28. Government	359.8	301.9	408.0	1.6
29. Miscellaneous services	908.0	897.4	1284.8	1.2
TOTAL:		10148.9	15328.5	2918.0

TABLE 15

RAPID IMPORT SUBSTITUTION, HIGH GROWTH

(million rupees)

Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1. Rice growing and processing	2507.7	1690.4	925.3	357.3
2. Jute growing and baling	174.3	141.5	65.7	38.4
3. Tea	150.6	123.6	87.3	31.1
4. All other major and minor crops, livestock, forestry and fishery	2874.0	2228.3	425.4	502.3
5. Sugar	205.4	62.5	163.9	98.4
6. Edible oils	276.4	107.4	58.3	100.6
7. Cigarettes and tobacco products	331.2	180.8	82.8	115.1
8. Miscellaneous food and drinks	310.5	127.9	137.6	121.4
9. Cotton textiles	560.2	200.5	307.5	228.8
10. Jute textiles	356.5	181.2	479.1	137.3
11. Other textiles	343.4	103.1	83.4	137.8
12. Paper and printing	210.5	53.4	290.3	74.8
13. Leather and rubber products	180.1	31.5	60.9	61.6
14. Fertilizer	240.3	133.9	465.9	84.0
15. Chemicals	536.3	318.5	368.4	197.3
16. Cement	70.2	25.9	177.1	25.6
17. Basic metals	314.9	112.5	713.6	168.5
18. Metal products	278.1	100.7	129.6	165.9
19. Machineries	696.5	315.7	1148.5	368.1
20. Transport equipment	163.7	66.1	204.1	97.1
21. Construction	2606.9	1532.9	391.0	268.0
22. Miscellaneous manufactures	688.9	335.8	498.8	197.6
23. Coal and petroleum	157.9	70.0	192.2	28.4
24. Electricity and gas	183.0	138.6	1066.9	13.5
25. Transport	889.4	825.4	1955.8	10.8
26. Trade	1323.1	1308.8	1881.4	0.6
27. Housing	735.3	513.9	4411.8	—
28. Government	388.9	326.4	441.0	1.7
29. Miscellaneous services	1087.2	1074.5	1538.4	1.4
TOTAL:		12431.7	18752.0	3633.4

TABLE 16

RAPID IMPORT SUBSTITUTION, VERY HIGH GROWTH

(million rupees)

Sector	Change in GVP	Change in value added	'Lagged' fixed investment for new capacity	Investment in working capital
1. Rice growing and processing	2728.9	1839.5	1007.0	388.8
2. Jute growing and baling	176.6	143.4	66.6	39.0
3. Tea	157.2	129.0	91.2	32.5
4. All other major and minor crops, livestock, forestry and fishery	3128.7	2425.8	463.0	546.9
5. Sugar	225.4	68.6	179.9	108.0
6. Edible oils	300.9	117.0	63.5	109.5
7. Cigarettes and tobacco products	359.7	196.4	89.9	125.0
8. Miscellaneous food and drinks	335.7	138.3	148.7	131.2
9. Cotton textiles	610.3	218.4	335.1	249.3
10. Jute textiles	362.2	184.1	486.8	139.4
11. Other textiles	374.0	112.3	90.9	150.1
12. Paper and printing	225.4	57.2	310.8	80.1
13. Leather and rubber products	194.2	34.0	65.6	66.4
14. Fertilizer	263.5	146.8	510.9	92.1
15. Chemicals	585.4	347.7	402.2	215.3
16. Cement	79.3	29.3	200.1	28.9
17. Basic metals	358.6	128.1	812.6	191.8
18. Metal products	311.4	112.8	145.1	185.7
19. Machineries	793.6	359.7	1308.6	419.4
20. Transport equipment	197.9	79.9	246.8	117.4
21. Construction	2940.7	1729.2	441.1	302.4
22. Miscellaneous manufactures	763.7	372.3	552.9	219.1
23. Coal and petroleum	173.6	77.0	211.3	31.2
24. Electricity and gas	198.9	150.6	1159.6	14.6
25. Transport	972.7	902.7	2139.0	11.8
26. Trade	1456.3	1440.6	2070.9	0.7
27. Housing	796.7	556.8	4780.2	—
28. Government	408.4	342.7	463.1	1.8
29. Miscellaneous services	1179.2	1165.4	1668.6	1.5
TOTAL:		13605.6	20512.0	3999.9

TABLE 17

ADDITIONAL EXPORT OF 115 MILLION

(million rupees)

Sector	Additional GVP	Additional value added	Additional lagged fixed investment	Additional investment in working capital
1. Rice growing and processing	2.9	2.0	1.1	0.4
2. Jute growing and baling	40.1	32.6	15.1	8.8
3. Tea	—	—	—	—
4. All other major and minor crops, livestock, forestry and fishery	19.9	15.4	2.9	3.5
5. Sugar	0.4	0.1	0.3	0.2
6. Edible oils	0.3	0.1	0.1	0.1
7. Cigarettes and tobacco products	—	—	—	—
8. Miscellaneous food and drinks	3.7	1.5	1.6	1.4
9. Cotton textiles	4.2	1.5	2.3	1.7
10. Jute textiles	56.2	28.6	75.5	21.6
11. Other textiles	0.7	0.2	0.2	0.3
12. Paper and printing	12.3	3.1	17.0	4.4
13. Leather and rubber products	10.0	1.8	3.4	3.4
14. Fertilizer	0.4	0.2	0.8	0.1
15. Chemicals	6.6	3.9	4.5	2.4
16. Cement	1.0	0.4	2.5	0.4
17. Basic metals	5.0	1.8	11.3	2.7
18. Metal products	3.2	1.2	1.5	1.9
19. Machineries	16.9	7.7	27.9	8.9
20. Transport equipment	3.2	1.3	4.0	1.9
21. Construction	35.4	20.8	5.3	3.6
22. Miscellaneous manufactures	15.9	7.8	11.5	4.6
23. Coal and petroleum	1.4	0.6	1.7	0.3
24. Electricity and gas	3.6	2.7	21.0	0.3
25. Transport	9.3	8.6	20.5	0.1
26. Trade	25.1	24.8	35.7	0
27. Housing	—	—	—	—
28. Government	—	—	—	—
29. Miscellaneous services	1.6	1.6	2.3	0
TOTAL:		170.3	270.0	73.0

TABLE 18

INCREASE IN EMPLOYMENT IN THE VERY HIGH-GROWTH CASES

(*Thonsand*)

Sectors	Moderate import substitution	Rapid import substitution
5	9.88	9.90
6	28.90	29.12
7	5.13	5.13
8	36.51	36.54
9	72.97	73.14
10	44.23	44.35
11	35.83	35.92
12	14.25	14.40
13	10.02	10.14
14	10.98	11.01
15	55.04	62.83
16	2.79	2.93
17	22.45	30.18
18	33.34	36.91
19	45.11	63.31
20	17.25	21.98
21	576.14	605.22
22	174.78	182.02
23	1.63	2.63
24	16.19	16.66
25	122.78	126.38
26	385.88	404.52
27	—	—
28	91.23	91.23
29	616.83	620.34
	2430.14	2536.79