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PERSPECTIVE PLANNING FOR ECONOMIC MATURITY:
CONCEPTS, LCGIC AND METHODOLCGY

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PERSPECTIVE PLANNING FOR ECONOMIC MATURITY:
Concepts, Logic and Methodology*

I. Introduction

The paper attempts to pin down operationally the so far loosely stated "Perspective-Plan" objective of elimination of dependence on foreign capital for underdeveloped countries that are currently dependent on such capital for economic growth at a reasonable rate. After discussing the inadequacy in this respect of both Perspective Planning in practice and also the professional literature, this objective is conceptualized as one of attaining economic maturity, which is defined in clear operational terms. Simple working rules are then derived within the framework of a linear two-sector model for guidance to Perspective Planning for attaining economic maturity and for growth thereafter.

II.   The Perspective Defined

1.   There is a growing concern in most undeveloped countries about their continuing dependence on foreign aid for economic growth at a reasonable rate, and a desire to eliminate this dependence before too long.   This is both understandable and desirable in view of the inclination that donours of aid may naturally feel to attach covert political strings to their ostensibly humanitarian gestures.

Planning authorities in countries like India and Pakistan have explicitly proclaimed elimination of dependence on foreign assistance as a major "Perspective-Plan" objective.   The professional literature is also giving increasing attention to the economics of "transition to self-sustaining growth".   The author feels that in none of these approaches has the issue been faced squarely.

2.   Take the case of Pakistan.   The Pakistan Perspective Plan /4/ estimates <u>net</u> inflow of external resources in 1985, the plan-terminal year, as Rs. 2,000 million.   Total foreign "assistance", equalling <u>gross</u> inflow of foreign capital[1] and given by net inflow plus servicing on outstanding external debts, <u>has not been estimated</u>.   Suppose we make a crude estimate ourselves to illustrate the magnitude of the issue in question.   Let us assume that exports and imports will grow at annual rates of 7.9 and 4.2 respectively, equalling respective annual average rates as estimated by the Planning Commission for the whole Perspective-Plan period /<u>op</u>. <u>cit</u>., p. 9/. Let us abstract from amortization, and assume all debts are, or have been

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[1]In principle one may deduct foreign private investment from the measure of foreign "assistance". For Pakistan this will not make any significant difference (the annual flow of foreign private investment into the country over the last decade or so has been in the order of Rs. 50 million only, and this has not shown any sure signs of growing).

converted into, perpetual loans. Let us assume the rate of interest on external loans to be the (concessional) rate of 3 per cent during the Perspective-Plan period. Under these assumptions gross capital inflows in 1985 would be in the order of Rs. 5,500 million[2]. In absolute terms foreign assistance that would thus be required to cover current trade deficit and interest charges on outstanding debt in 1985 would be about 30 per cent higher than that in 1965, (when it is estimated to be around Rs. 4,200 million). As a percentage of GNP it would fall from around 9 per cent to around 3 per cent. The fall would be significant, but so would be what remains.

Notwithstanding the crudeness of the above calculations it is clear that the country will be far from becoming independent of foreign finance by 1985 if the Perspective Plan as designed is followed. Suppose we ask now about the possible future course of the country's need for foreign finance to meet its external payments obligations.

Let E_t, M_t and F_t represent export earnings, imports and the flow of foreign finance into the country in year t. The flow of _foreign finance_ is defined as the flow of external loans and foreign private investment in the country (including reinvestment of profits of existing foreign concerns), as distinguished from _gross capital inflows_ defined as the sum of trade deficit, debt services and repatriation of profits of foreign concerns.[3] Let e and w represent the rates of growth of

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[2] Estimated from export-import figures given in Pakistan's Third Plan /4/ and figures on outstanding external debts given in an IBRD study /7/. The IBRD is not officially responsible for the latter figures.

[3] From the point of view of determining a country's _dependence_ on external finance it is the total flow of foreign finance as defined that is relevant rather than gross capital inflows, the two differing by the extent to which profits of foreign concerned are reinvested in the country. (See § II.4)

exports and imports respectively, and i the (average) rate of return on foreign finance. Then we have, continuing with the assumption that all loans are perpetual loans,

$$F_{t+1} = (1+i)\, F_t + wM_0\, (1+w) - eE_0\, (1+e)^t; \quad t = 1, 2, 3, \ldots$$

where t = 0 represents the last year of the Perspective Plan. Solving the difference equation we have

$$F_t = \left(F_0 - \frac{w}{w-i}\, M_0 + \frac{e}{e-i}\, E_0\right)(1+i)^t + \frac{w}{w-i}\,(1+w)^t - \frac{e}{e-i}\, E_0\,(1+e)^t$$

In order for F_t to become eventually zero, the coefficient of the dominant root in the solution must be negative. Continuing with the same assumptions about growth of exports and imports, the relevant question is therefore whether e exceeds i.

If foreign finance continues to be available <u>at the concessional rate</u> even after the Perspective-Plan period, F_t will eventually drop to zero. If however concessional finance is withdrawn at the end of the period and the country is required to seek foreign private capital to finance its external payments obligations henceforth, the situation could be very different.[4]

Assume, for example, a 10 per cent rate of return on private foreign capital, a rate that Pincus /8 , p. 131/ estimates as the average rate of return on private foreign investment currently in all developing countries taken together, and what must be a gross underestimate of the

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[4]A third alternative is to float public bonds in the international market. The possibilities in this direction will depend on the country's "credit-worthiness", and it is doubtful whether a country will be able to borrow significant amounts from international lenders as long as it remains essentially <u>dependent</u> on external finance to meet its minimum (in a sense to be developed in this paper) external payments obligations.

normal rate of return[5] that foreign investors should be offered for
countries like India and Pakistan. Then i $>$ e. With F_o at Rs. 5,500
million and E_o and M_o at the Perspective Plan estimates (for 1985) of
Rs. 1,600 and 1,400 million respectively, the coefficient $(F_o - \frac{w\,M_o}{w-i} + \frac{e\,E_o}{e-i})$ would be positive, equalling Rs. 1,350 million approximately.
Under such circumstances, then, the country will be destined to a con-
tinuous and ever-growing dependence on foriegn finance to meet its foreign
payments obligations. It is even conceivable that the flow of foreign
finance on which the country will thus remain dependent will continue to
grow as a proportion of GNP, a situation that would hardly be consistent
with the desire to eliminate dependence on external finance.

Remembering in particular that the above calculations exclude
amortization, one may justifiably take a rather skeptic view of the pro-
gress towards "elimination of foreign assistance" that Pakistan will make
by 1985 by following its Perspective Plan.

Similar comments may be made about India's Perspective Plan also.
The problem of debt servicing in India's long-term planning has been dis-
cussed lucidly by Dr. Sengupta, /11/ where he has shown that except under
very optimistic assumptions India's Perspective Plan cannot be expected
to make the country independent of foreign finance by the plan-terminal
year as the Plan proclaims.

3.   Turning now to the professional literature, here also one finds
a mixture of vagueness and ambiguity in the vision of economic self-
sufficiency.

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[5]In the traditional economic-theory sense of minimum inducement
earnings.

The growing literature on the economics of what has become
fashionable to be called "transition to self-sustained growth" has not
been careful in defining "self-sustaining growth" meaningfully for
planning purposes. Rodenstein-Rodan defines this term as marking "a
stage where aid is not required any more, while normal capital inflows
--- private foreign investment --- may continue" /10, p. 115/. An IBRD
study defines it "to mean a rate of income increase of, say 5 per cent
p.a.; financed out of domestically generated funds and out of foreign
capital which flows into the country because it wants to do so (invest-
ment is irrestibly attractive)" /6, p. 105/. Such definitions may be
good for historical analysis, i.e., for distinguishing between countries
which historically are growing at a respectable rate with non-concessional
external finance and countries which are not; they are not good for long-
term planning purposes which would require more precise operational
guidance as to the rate of private foreign investment to be postulated if
this is to be covered by the notion of self-sufficiency. A more specific
definition is given by Chenery and Strout, who defines self-sustaining
growth as "growth at a given rate with /net/[6] capital inflow limited to
a specified ratio to GNP which can be sustained without concessional
financing" /2; p. 685 n/. This definition, while it is specific in
terms of net capital inflows, leaves open the all-important question of
the magnitude of the total flow of foreign finance the country will need
simply to stay on the path of what has been termed "self-sustaining

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[6]The word "net" does not appear in this specific citation, but
this is the only interpretation consistent with the Chenery-Strout paper
which talks only of net capital inflows, and debt services do not feature
in their model at all (although they do define "foreign assistance" so
as to cover not only outright grants but also loans and foreign private
investment [see op. cit., p. 679n].

growth". For example, if net capital inflows are continued at the postulated limiting ratio to GNP, the flow of total foreign finance will bear a ratio to GNP higher than the above limiting ratio, and this second ratio may itself continue to grow if the average rate of return on foreign capital in the country is higher than the growth rate of GNP itself. The import of such definition of "self-sustaining growth" is therefore not clear unless the supply schedule of foreign finance for the period after concessional finance is withdrawn is specified; this is one of the most difficult areas of forecasting and planners can hardly be expected to make estimates of the supply schedule of foreign finance, say from after 20 years from now, with any reasonable degree of confidence.

4.   It must be concluded that the state of affairs to which the "transition" is to be made requires more careful articulation in order to give Perspective Planning a minimum sense of direction.

If a country is unable to finance out of its own export earnings (a) its current imports, (b) its external debt services, and (c) repatriation of profits of foreign concerns in the country, then it has to depend on further foreign finance of some kind or other to meet this bill. Part of this required additional foreign finance may be forthcoming, under certain circumstances, spontaneously: for example, foreign private investment in the country, in the language of /6/, may be "irresistibly attractive". The country nevertheless remains dependent on such foreign investment and/or others to meet its foreign payments obligations and has to follow policies, economic and perhaps political, so that foreign private investment remains "irresistibly attractive". While some countries may be willing to follow such policies and continue with them, most newly independent countries are yet to arrive at any general social concensus

as to the shade of politico-economic ideology that would best suit the temper and aspirations of society, and for such countries it would be premature to get committed to a continuation of any set of economic and political policies for courting foreign private investment at any signi- ficant scale to sustain a reasonable rate of growth. The goal in question of Perspective Planning may therefore be identified with the ability to sustain a postulated minimum rate of growth of GNP without any form of foreign finance.

We shall henceforth call this goal the attainment of economic maturity. A mature economy is thus defined as one whose growth rate will not fall below a postulated minimum if the flow of foreign finance ceases.

For our purpose let us further define self-sustaining growth as growth at the postulated minimum rate without foreign finance. A mature economy will not necessarily move along the path of self-sustaining growth. The path of mature growth, instead, is conceived as one such that from any given position on this path the economy can land on the path of self-sustaining growth if the flow of foreign finance is stopped for any reason whatsoever. This path can be higher than the path of self- sustaining growth if foreign finance is available at terms that enables the country to utilize it in a way so as to ensure smooth landing on the latter path at any time the country desires or finds itself compelled to do so. The conditions under which this becomes possible are discussed in Section IV.

5.   In the next section we shall derive, within the framework of a conventional linear two-sector model, the terminal conditions that must be satisfied in order for economic maturity as defined above to be attained at the termination of a Perspective Plan. The two sectors will

be called the "traditional" sector, whose output is partly absorbed at

home and partly exported, and the "import-substitution" sector. The

basic framework of the model is nothing new (see /3, 1, 2/).[7] The only

major refinement is the introduction of <u>debt services</u> (along with re-

patriation of profits of foreign concerns). The necessity for doing this

should be clear from the foregoing paragraphs: unless donours of foreign

"aid" assure that they will continue with loans at concessional terms

until the period when recipient countries can repay all outstanding debts,[8]

the omission of debt services from a long-term plan covering 20 years or

so with debt services being refinanced all the time by fresh loans would

make the model essentially worthless as a policy guide.

For analytical handling of debt services it is convenient to make

an assumption. We assume that the post-Perspective-Plan of debt services

due to external debts incurred before and during the Perspective Plan

would be fairly constant for a sufficiently long period, say 20 years

or so from after the Perspective Plan, after which it may or may not fall

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[7]The most important assumption underlying models of this type is
that resources are 'fluid', at least in the relevant choice range, so
that they can be allocated between consumption and investment in the way
as would appear "rational" following such models. This should be dis-
tinguished from Mahalanobis-type models which assume non-shiftability of
resources from consumption to investment and vice versa, and should be
remembered throughout the analysis in this paper to understand how the
model works. The analysis could be carried out in terms of a Mahalanobis-
type model, but this would not change the basic perspective at which the
analysis is aimed. It may also be noted that practical planners in many
countries who we presume are experienced people are explicitly or im-
plicitly using this approach themselves.

[8]The author understands that a section of the profession ad-
vocates that underdeveloped countries should not be required to return
their ebt at all. While the underlying spirit is appreciable, the fact
remains that debtor countries cannot drop debt servicing from their
accounts simply relying on such wishes, as long as such wishes are not
actually translated into formal congressional approvals in donour countries
for writing off foreign aid.

but will not rise. The assumption is justified in a situation where the detailed terms of external loans to be incurred during the Perspective-Plan period are not known beforehand so that it would not be worthwhile to make a more complicated assumption about the return flow for working out general guidelines to Perspective Planning.[9] Under this assumption we may use, in our calculations, a constant flow of debt service from the plan-termination year T due to debts incurred until year T. The method may overestimate debt service charges for the period after "T + 20", and accordingly the resulting plan may serve to leave more disposable resources for the "generations" beyond year "T + 20" than would be considered rational or necessary otherwise. This gesture to posterity may not be grudged, particularly since the margin of error in calculations for such a distant future will be too high anyway to warrant a more refined calculation as long as the conscious error is made on the safer side.[10]

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[9]It is also in the tradition of "sound banking principles" to incur debts in a way that makes the flow of debt services fairly smooth over time. For those who insist on more accurate calculations for generations far out into the future (e.g., those who advocate infinite-horizon planning) here is a citation that we all can enjoy regardless of which side we take in the issue:

The human race, to which so many of my readers belong, has been playing at children's games from the beginning ... And one of the games to which it is most attached is called "Keep to-morrow dark," and which is also named (by the rustics in Shropshire, I have no doubt) "Cheat the Prophet". The players listen very carefully and respectfully to all that the clever men have to say about what is to happen in the next generation. The players then wait until all the clever men are dead, and bury them nicely. They then go and do something else. For a race of simple tastes, however, it is great fun (G.K. Chesterton, The Napoleon of Notting Hill; citation discovered in H. Theil, Economic Forecasts and Policy).

[10]The kink on the time-path of national disposable income that would thus occur when all debts are repaid and the constant flow of debt services ends abruptly, if the country stays on the path of self-sustaining growth from year T onwards, would be of relatively minor importance as the proportion of debt services to national income, with the former constant but the latter growing, would be continously falling.

6.   We shall also use the term GNP in the sense of resources at the disposal of the nation rather than in the conventional sense of the flow of resources earned by the nation. GNP will thus be defined as gross domestic product minus the sum of contractually required debt services and profits of foreign concerns in the country. The reason for using this definition of GNP is that it is national disposable income thus defined that is available to the nation for allocation between consumption and investment on the path of self-sustaining growth irrespective of what national earnings are. While the earnings measure of GNP may represent a valuation in flow terms of the country's net assets, for the purpose of planning for economic maturity as defined, the disposable income measure is the one more directly relevant. It may also be noted that a growth rate in terms of national earnings (the conventional measure of GNP) can be translated, given the rate of interest and amortization on external debts and the rate of return on foreign private investment, into a growth rate in terms of national disposable income and vice versa. In particular, the rate of growth of one will be maximized when the other is in such a situation. However, both these rates may not be constant over time along the path of self-sustaining growth as long as outstanding debts remain, and in such a situation it is easier to work with a given minimum rate of growth (as required by our notion of economic maturity)   in terms of national disposable income rather than national earnings.

III. The Terminal Conditions

1.   We shall now set out to derive the terminal conditions that must

be satisfied by a Perspective Plan designed to make a country economically

mature by the end of the plan-period.

Let the economy be divided into two sectors. Sector I produces

"traditional" goods, a part of which is absorbed at home and a part ex-

ported; sector II produces "importables". We postulate that planners

desire plan-terminal (disposable) GNP to be not less than a specified

minimum, which we shall call the target plan-terminal GNP: (1) $Y_T \geqslant \overline{Y}$,

i.e., $V_{(T)} + V_{2(T)} - D_T > \overline{Y}$, where Y stands for GNP, V_1 and V_2 outputs

in the two respective sectors, D for the sum of debt service and profits

of foreign concerns, and T the plan-terminal year. This target itself

is a terminal condition for the Perspective Plan: given total outstanding

indebtedness and private foreign capital at the plan-terminal year T, the

condition requires that the point $(V_{1(T)}, V_{2(T)})$ must not lie below a

straight line relating $V_{2(T)}$ to $V_{1(T)}$ with slope minus unity and V_2

-intercept, given by $\overline{Y} + D_T$, higher the larger is D_T (figure in page 19   ).

2.   The attainment of economic maturity at the end of the plan-period

requires another terminal condition to be satisfied. To derive this

terminal condition we postulate the following structural and pre-

determined coefficients:

b_1, b_2 : marginal output-capital ratios in the respective sectors
            with a lag of one year, output defined in the value-
            added sense;

n_1, n_2 : requirement of importables per unit of investment in
            the respective sectors;

m_1, m_2 : requirement of importables per unit of current output
            (value added) in the respective sectors;

m   :   <u>minimum</u> requirement of importables for consumption per unit of GNP, a pragmatic working rule determined by planners taking into consideration the community's propensity to consume importables and planners' own notions of what are "essential" consumer goods and what are not;

e   :   estimated annual rate of growth of exports, assumed exogeneously given.[11]

We also assume that planners postulate a constant proportion, s, of GNP to be saved and invested within the country after the target plan-terminal GNP is reached. Given this savings coefficient, and given any feasible rate of growth 'g' of GNP, there is a unique proportion of GNP, lying between o and s, that must be allocated in the import-substitution sector. Let this proportion be denoted by α_1, and the corresponding proportion for the traditional sector by α_2, so that

$$(2) \qquad \alpha_1 + \alpha_2 = s \qquad , \text{ and}$$

$$(3) \qquad \alpha_1 b_1 + \alpha_2 b_2 = g \qquad , \text{ and the solution of } \alpha_1 \text{ and } \alpha_2$$

in terms of g is

$$(4) \qquad \alpha_1 = \frac{g - sb_2}{b_1 - b_2} \; ; \qquad \alpha_2 = \frac{sb_1 - g}{b_1 - b_2}$$

3.   In order for transition to economic maturity to be completed by the end of the Perspective-Plan period, in the terminal year T the sum of

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[11]It is also assumed that the long-run terms-of-trade is not expected to change significantly in either direction. Any expected change in the terms-of-trade will require making a distinction between growth of the <u>volume</u> of exports and growth of the <u>value</u> of exports.

A possible extension of the model would be to treat exports also as a control variable. In this case a change in the expected terms-of-trade should be treated as an <u>endogenous</u> outcome of the model except for small countries unable to influence the terms-of-trade by altering the supply of exports. The distinction between change in the volume and that in the value of exports cannot <u>a fortriori</u> be ignored in such a situation, and the assumption of a constant capital-coefficient in the export sector both in the value as well as in the volume sense as made, e.g., in Chenery and McEwan /1/ would not be valid.

(a) exports and (b) the output of the import-substitution sector, must not ·be less. than the sum of (c) minimum real imports needed for self-sustained growth and (d) debt services and pro-fits of foreign concerns. Of these, (c) has three components relevant for our enquiry: (i) minimum consumption imports, (ii) import of inter-mediate goods, and (iii) import of capital goods.

The items (a), (b), (c-i and c-ii) and (d) will be given by the Perspective Plan, the coefficients of the model and estimation of plan-terminal exports. Item (c-iii) depends on the choice of the minimum rate of growth of GNP that the country desires to be able to sustain without foreign finance. Let this desired minimum rate of growth be called $\bar{\bar{g}}$. Obviously, $\bar{g}$ cannot be indefinitely high and yet be self-sustained. For a meaningful choice of $\bar{g}$ it is necessary therefore to know what the maximum rate of self-sustained growth for the economy is.

Let B_t stand for the excess of the items (a) and (b) taken together over items (c) and (d) taken togehter, an excess that we shall call the balance of payments margin. This excess may be regarded as a measure of the availability of· foreign exchange to finance "non-essential" consumption imports when the economy is growing without foreign finance. In order for the rate of growth 'g' to be sustained without foreign finance from year T onwards we must have $B_t > 0$ for all $t \geq T$.

The time-path of B_t is given by the following difference equa-tion:

$$(5) \quad B_{t+1} - B_t = eE_o(1+e)^t + \alpha_2 b_2 Y_t - (m_1+m)\, \alpha_1 b_1 Y_t$$
$$- (m_2+m)\, \alpha_2 b_2 Y_t - (n_1 \alpha_1 + n_2\, \alpha_2) g Y_t$$

The equation says that increase in the balance of payments margin from year t to year t+1 equals increase in exports plus increase in the production of importables at home minus increase in the minimum require-ment of importables (the flow of debt service and profits of foreign

concerns being assumed constant). Writing $Y_t = Y_o(1+g)^t$ and arranging

terms, we have

(5.1) $\quad B_{t+1} - B_t = eE_o(1+e)^t + \lambda Y_o(1+g)^t$, where

$$\lambda = [(1-m-m_2)b_2 - n_2 g] \; \omega_2 \; -[(m+m_1)b_1 + n_1 g)] \; \alpha_1$$

$$= [(1-m-m_2)b_2 - n_2 g] \cdot \frac{sb_1 - g}{b_1 - b_2} \; - [(m+m_1)b_1 + n_1 g] \cdot \frac{g - sb_2}{b_1 - b_2} \; .$$

The solution of this difference equation is given by

(6) $\quad B_t = B_T + E_T [(1+e)^{t-T} -1] + \frac{\lambda}{g} Y_T [(1+g)^{t-T} -1]; \quad t \; \geqslant \; T.$

From this, a _sufficient_ condition for the balance of payments margin

never to be negative from year T onwards is that [12]

(7a) $\quad \lambda > 0$, and (7b) $B_T \geqslant 0.$

λ is a quadratic function in g, and is negative for $g = sb_1$

and positive for $g = sb_2$, so that it must vanish for some g inbetween

sb_1 and sb_2. Denoting this critical value of g by g*, [13] it can be

readily seen that any rate of growth $g \leqslant g^*$ can be sustained without

foreign finance from the plan-terminal year onwards if the balance of

payments margin is non-negative in the plan-terminal year, irrespective

of the rate of growth of exports as long as the latter is also non-

negative. This happens because any growth rate of GNP not higher than

g* is associated with such allocation of investment between the two

sectors as to ensure that the increase in minimum requirement for impor-

tables generated by growth at this rate can be met fully from increased

production of importables at home.

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[12] Assuming, of course, that both E_T and 'e' are non-negative.

[13] g* may be interpreted as the _von-Neumann rate of growth_ for the
economy.

Whether a growth rate higher than g* can be sustained or not without foreign finance depends on the relative values of e and g and the initial conditions B_T, E_T and Y_T, and can be found out readily from solution (6) once these debts are known. While planners may be able to rationalize choice of a minimum post-Perspective-Plan growth rate (without foreign finance) higher than g* by producing appropriate estimates regarding plan-terminal exports and growth of exports thereon, g* suggests itself as a "safe limit" to the minimum growth rate to be postulated in view of the large margin of error usually associated with estimation of future export possibilities. If g* happens to be too small for the planners' aspirations, the situation would seem to call for a move toward structural change so as to alter some or other coefficient(s) in the model in order to raise g*. The problem and possibilities of such structural change will not be explored in this paper.

As an illustration of the order of magnitude of g*, let the various parameters have the following values, which may not be far from the Pakistan situation.[14]

b_1	b_2	n_1	n_2	m_1	m_2	m	s
.33	.22	.35	.50	.10	.20	.10	.20

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[14] b_1 and b_2 roughly corresponds to the Chenery-McEwan assumptions for Pakistan (op. cit., p. 238); n_1 and m_1 to the Chenery-McEwan estimates for the aggregate import rates on investment and output respectively. n_2 and m_2 have been arbitrarily fixed for illustrative purposes. So is 's', fixed at a plausible 20 per cent. Imports of consumption goods in Pakistan during the Second Five-Year-Plan period, including P.L. 480 imports, have been roughly in the order of 4 to 5 per cent of GNP (as it appears from Annexure 1, pp. 96-97 of the Third Plan document /4/); we have raised this ratio arbitrarily to 10 per cent to reflect the possibility that with higher incomes a higher proportion of income may have to be allocated for a minimum consumption of importables.

This gives g^* as .057 approximately, with corresponding values .118 and .082 respectively for α_1, and α_2. Thus with these values the economy can sustain without foreign finance and without relying on growth of exports, a 5.7 per cent rate of growth of GNP, and for this it has to continuously invest about 8.2 per cent of GNP (i.e., approximately 2/5 th of total investment) in import-substitution and 11.8 per cent (approximately 3/5th of total investment) in traditional production. It may also be noted that a _necessary_ condition for sustaining a growth rate higher than 5.7 per cent in such an economy is that exports should grow at a rate _higher than 5.7 per cent_, since λ will be negative for any feasible $g > g^*$ (see equation 6).

4.   Given the postulated post-plan minimum rate of growth $\bar{g}$ of GNP, and the corresponding values of α_1 and α_2 (to be denoted $\bar{\alpha}_1$ and $\bar{\alpha}_2$ respectively), the attainment of economic maturity by year T requires that B_T, given by the following, must be non-negative.

(8) $B_T = E_T + V_{2(T)} - m_1 V_{1(T)} - m_2 V_{2(T)} - m Y_T - (n_1 \alpha_1 + n_2 \alpha_2) Y_T - D_T$

where D_T is the flow of the sum of debt services and profits of foreign concerns from year T onwards due to cumulative external loans and foreign private investment until year T. Noting that $Y_T = V_{1(T)} + V_{2(T)} - D_T$, and arranging terms, we have the following constraint

(8.1) $E_T + \mu_2 V_{2(T)} - \mu_1 V_{1(T)} - \mu_3 D_T \geqslant 0$ where

$\mu_1 = m + m_1 + n_1 \alpha_1 + n_2 \alpha_2$;

$\mu_2 = 1 - (m + m_2 + n_1 \alpha_1 + n_2 \alpha_2)$;

$\mu_3 = 1 - (m + n_1 \alpha_1 + n_2 \alpha_2)$.

The constraint 8.1 is the second terminal condition that the Perspective Plan must satisfy for economic maturity to be attained by year T. The constraint implies that choice of the two terminal outputs $V_{1(T)}$ and $V_{2(T)}$ must be on or above a straight line, relating $V_{2(T)}$ to $V_{1(T)}$, with positive slope equalling $\dfrac{\mu_1}{\mu_2}$, and V_2-intercept, equalling $-\dfrac{1}{\mu_2}(E_T - \mu_3 D_T)$, rising with D_T.[15] The slope $\dfrac{\mu_1}{\mu_2}$ measures the amount by which terminal output of the import-substitution sector has to be increased if terminal output of the traditional sector is increased by one unit and the resulting readjustment of the flows of national savings and foreign aid leaves D_T unchanged. With numerical values as before, this slope equals .457 approximately for $g = g^*$.

The two terminal conditions (1) and (7) together give a lower bound to the choice of the terminal output-vector $(V_{1(T)}, V_{2(T)})$ as given by the line ABC in the diagram. The position of this line depends, given the coefficients of the model, on D_T. For countries like India and Pakistan which expect the bulk of their needs for foreign finance during their Perspective Plans to be met by foreign "aid", D_T depends largely on (a) the cumulative total of foreign aid that would be obtained during the country's transition to economic maturity, and (b) the terms of repayment of foreign aid. The higher is D_T, the higher will both the segments AB and BC of the line ABC be, and hence higher will have to be the minimum plan-terminal output of the import-substitution sector for any given plan-terminal output of the traditional sector.

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[15]A third terminal condition also needs to be mentioned: D_T cannot exceed E_T for, if it does, the requirement of _liquid_ resources to meet payments in foreign exchange will exceed the supply of such resources, and this alone will make the country dependent on foreign finance to meet its external payments obligations irrespective of home production of importables. The author is greatly indebted to Dr. Miss Sen for pointing ₁this out, and refrains from elaborating this point further in order not to anticipate a work that Dr. Sen is doing herself.

$V_{2(T)}$

A

C

B

0

$V_{1(T)}$
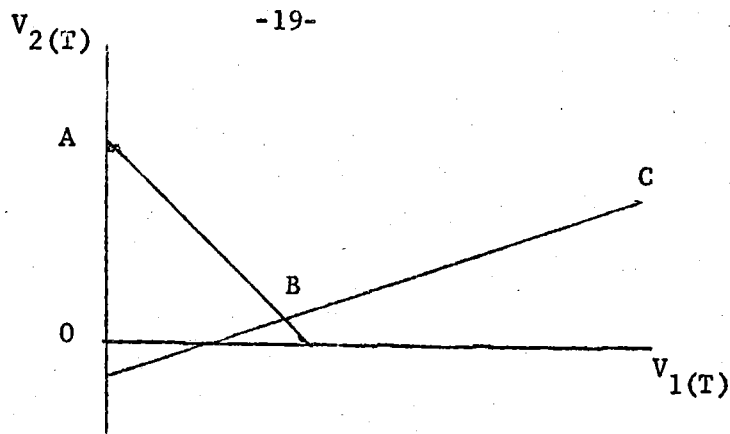
5.　　The point B is of special interest. It represents the situation where plan-terminal GNP is exactly equal to the target $\bar{Y}$ and plan-terminal balance of payments margin is zero. Given D_T, this must represent the plan-terminal output-vector if the sum of any monotonically increasing utility function of annual consumption over the Perspective-Plan period is maximized. This is because any other feasible output vector will contain a margin in terms of plan-terminal GNP and/or balance-of-payments that can be reduced thereby releasing resources for higher consumption during the plan-period. In case such an optimization policy is followed, then, given D_T, optimum plan-terminal outputs of the two sectors as given by the coordinates of the point B will be:

$$(9) \quad V_{1(T)} = \frac{1}{\Delta} [E_T + \bar{Y} + (1 - \mu_3) D_T],$$

$$V_{2(T)} = \frac{1}{\Delta} [\frac{\mu_1}{\mu_2} \bar{Y} - E_T + (\frac{\mu_1}{\mu_2} + \mu_3) D_T],$$

$$\text{where } \Delta = 1 + \frac{\mu_1}{\mu_2}$$

The specific (optimum) time-path of consumption during the plan-period will depend on the specific time-path of net capital inflows that become available, and the specific utility function that is used in the programme. With our present knowledge it would be difficult to rationalize a choice from a wide range of plausible alternative

specifications of the utility function.[16] While fundamental principles

like diminishing marginal utility from consumption can be readily

rationalized, no guidance whatsoever is available as to choice of

specific parameters like, say, the elasticity of marginal utility.

Practical planners may therefore find it more convenient without being

the less rational at least with our present knowledge to choose the con-

sumption path directly from amongst a number of conveniently spaced

feasible and efficient alternatives.

We do not present such exercises in this paper because it is

impossible, from the academic table, to postulate any meaningful hypothesis

about the inflow of foreign aid to any underdeveloped country in any

case, and a purely conceptual exercise would not be in the spirit of

this paper. The availability of foreign aid in today's world is a matter

of political diplomacy, and a scientific analysis of it in terms of

operational planning concepts is still awaited. All that we can suggest

is that a number of alternative Perspective Plans may be worked out

assuming conventional terms of foreign aid and indicating the requirement

of aid --- annual and cumulative --- in each such plan under these terms,

and these different plans may be ranked in order of preference before

confronting the aid-giving "consortium" across the bargaining table. The

rest is largely a matter of political maneuvering that may be suggested

for a separate and inter-disciplinary study.

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[16] cf., Tinbergen /11, p. 19/. Note also Hicks /5, p. 262/:
"If the question is simply one of the choice between two
'commodities', it is equally rational to give a high value, or a low
value, to one in terms of the other."

IV. Beyond the Perspective

As mentioned previously, the attainment of economic maturity is not to be identified with actual stoppage of the flow of foreign finance. While foreign "assistance" in the sense of concessional foreign finance would be discontinued, there is no reason why a continuous further flow of foreign finance at prevailing market terms should not be considered as a purely business proposition. On the other hand it should be insured that the country does not once more become dependent on foreign finance at any stage thereafter for growth at the postulated minimum rate.

To see the possibility of continuing with foreign finance in the post-Perspective-Plan era for growth at a rate higher than the postulated minimum without getting dependent on further foreign finance for subsequent growth at the postulated minimum rate itself, the terminal condition (8.1) may be extended to cover years subsequent to T. Consider a choice of using foreign finance, offered at a rate of return i, in the year T. Obviously, to sustain economic maturity the constraint (8.1) should be satisfied for year T+1, with the return on foreign investment in year T added to D_T. Suppose we inquire under what condition the constraint will be just satisfied. We then have the equality:

$$(9) \quad \mu_2 V_{2(T+1)} - \mu_1 V_{1(T+1)} = \mu_3 (D_T + iF_T) - E_{T+1}$$

Suppose the amount of foreign finance F_T is wholly invested, in addition to investing total national savings, and suppose a proportion 'u' of this additional investment is allocated to the import-substitution sector. Assume also that constraint (8.1) is satisfied for year T by exact equality. Then the balance-of-payments margin for year T+1 is given by:

$$(10) \quad B_{T+1} = eE_T - [\mu_1 b_1 u + i\mu_3 - \mu_2 b_2 (1-u)] F_T$$

$$= eE_T - [(\mu_1 b_1 + \mu_2 b_2) u - (\mu_2 b_2 - i\mu_3)] F_T$$

For B_{T+1} to be non-negative, we must have

$$(11) \quad u \leq \frac{eE_T}{(\mu_1 b_1 + \mu_2 b_2) F_T} + \frac{\mu_2 b_2 - i\mu_3}{\mu_1 b_1 + \mu_2 b_2}$$

The condition (11) is necessarily satisfied, for any $e \gtrless 0$, by some 'u' in the feasible range $0 \leq u \leq 1$ if $i \leq \dfrac{\mu_2 b_2}{\mu_3}$, in which case the expression in the righthand side would be positive. Thus it would be possible to utilize any amount of foreign finance[17] offered at a rate of return $\dfrac{\mu_2 b_2}{\mu_3}$, which we shall call i*, without losing economic maturity by allocating an appropriate proportion of the additional investment to the import-substitution sector so as to satisfy condition (11). Depending on the rate of growth of exports, e, a rate of return higher than i* may also be accommodated.[18]

With numerical values as in the previous section, i* equals .166 approximately with $g = g^*$.

The analysis can be extended to the case where the supply schedule of foreign finance is not perfectly elastic. The basic point we want to emphasize would still remain, i.e., that with foreign finance available at sufficiently favourable terms it may be possible for the country to continue to use foreign finance thereby growing at a rate

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[17]Subject, of course, to "absorptive capacity" in the import-substitution sector.

[18]With relative values of e, i and the other relevant coefficients sufficiently favourable so that investing the whole amount of foreign finance in import-substitution becomes unnecessary to ensure smooth landing on the path of self-sustaining growth in subsequent years, part of this foreign finance may be used directly to use current consumption. Thus a trade-off between a higher growth rate and higher current consumption can be conceived. A preliminary exploration of this question has been made by the author in another paper /9/ assuming foreign finance to be continuously available in unlimited amounts at a constant and low rate of interest.

higher than the postulated minimum and yet remain independent on foreign finance to grow at the postulated minimum rate. The path of mature growth can thus conceivably lie above the path of self-sustaining growth. The important point to be emphasized is that an appropriate portion of the additional investment made possible by foreign finance would have to be allocated for further production of import-substitutes all along the former path in order to ensure smooth landing on the latter path at any time this is desired or becomes necessary.

The latter path, i.e., the path of self-sustaining growth, will in this process be continuously moving upwards itself. Thus a conscious departure from the path of self-sustaining growth at any time, as long as an appropriate increase in investment in import-substitution is possible and is made, would enable a country to land on a higher path of self-sustaining growth in the future, an advantage that should be seriously considered in formulating an approach to foreign capital inflows after the country has attained economic maturity. We do not explore this question further as it is too early for most under-developed countries to confront this situation in any details.

V. Conclusion

1.   We have seen that while the objective of eliminating dependence
on foreign assistance has been explicitly proclaimed by Perspective Plans
in countries like Pakistan and India, this objective has not been given
any operational expression in actual formulation of the plans, and ex-
pected results of these plans do not really measure up to this objective.

2.   On the other side there is a tendency in the professional litera-
ture to use sophisticated programming techniques to derive so-called
"optimum" paths of "transition to self-sustaining growth" without a
clear notion of the state of affairs to which the transition is to be
made. Most conspicuous in such approaches, which suggest increasing the
net flow of foreign resources in earlier years to reduce this flow in
later years, is the absence of debt services in the accounting.[19]

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[19]In the Chenery-McEwan study on "optimal" patterns of growth and
foreign aid in Pakistan, the cost of foreign aid has been derived endo-
genously as the "shadow price" of foreign capital. The model does not
however have any return flows of resources, so that in effect foreign aid
remains a free resource economically. Pakistan'd demand for foreign aid
in such a situation would equal the supply of foreign aid only if Pakistan
has a psychic disutility from foreign aid, ---equal in magnitude to the
"shadow price" of foreign capital, --- which it uses to derive the "optimum"
inflow of foreign capital (See Rahman /9/). One of the authors of the
Chenery-McEwan paper maintains in a communication to the present author
that this is a misinterpretation of the Chenery-McEwan concept of "shadow
price". The author does not see how. It may be noted that if we apply
a rate of interest as low as 3 per cent to the Chenery-McEwan "optimal"
pattern of foreign aid to Pakistan as envisaged in their "basic model"
(op cit., p. 241), Pakistan's outstanding external indebtedness in 1982,
the year when foreign assistance terminates in the basic model, would be
in the order of Rs. 120 billion, and interest charge alone on this would
be around Rs. 3,600 million. Since the Chenery-McEwan model envisages
Pakistan's balance-of-trade to be zero from 1982 onwards, the country will
never be able to finance its debt services except by continuous fresh
borrowing, and thus will be perpetually dependent on an ever-increasing
flow of foreign finance for this purpose. The Chenery-McEwan model there-
fore, can be made to make sense only under the assumption that foreign aid
is free. In such a situation Pakistan must have a psychic disutility
from such charitable treatment in order that its "demand" for aid will
be contained within reasonable proportions.

Because debt services have got to be refinanced as long as net capital·
inflows continue, the effect of earlier timing of any given cumulative
total of net capital inflows is to increase the debt service liability
in later years. As a result, while the flow of net foreign capital re-
quired to finance the trade deficit may be reduced over time and perhaps
earlier than otherwise by such a policy, the flow of total foreign
finance needed to offset the total "balance-of-payments deficit"[20] may
for the same reason become higher than otherwise in later years[21] unless
care is taken to appropriately increase the production of import-substitu-
tes. In a situation where debt services and repatriation of profits of
foreign concerns remain a contractual liability that is respected by the
country receiving "aid", it is the latter that is the issue in question,
and a programme that makes a country "self-sufficient" early in the sense
only of eliminating its trade gap may conceivably make it more dependent
on external finance than otherwise to meet its total "balance-of-payments
gap".

Obviously, such "optimum programming is useless as a policy guide
to long-term planning in underdeveloped countries. The problem of debt
servicing cannot be solved by assuming it does not exist; this may
actually lead to policies that aggravate the problem. The first and
absolutely necessary step towards solving this problem is to confront it;
the second step is to smooth out some of the detailed intricacies of
the issue to make the problem manageable without losing its essence.

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[20] In the "potential" sense, i.e., including profits of foreign
concerns in the country if any.

[21] As it very clearly must happen for Pakistan if either the
official Perspective Plan or the Chenery-McEwan "optimal" policy is
followed. Consider, for example, amortization at the rate of Rs. 5,000
million or so annually from about 1985 on top of interest charges so as
to repay outstanding debts (until 1985) in 20-30 years hence.

3.   We have tried in this paper to devise some working rules that
may be used both to assess a country's ability to truly eliminate de-
pendence on foreign assistance within a specified period and as a guide
to policy directed in this direction, given (a) a target plan-terminal
national income, (b) the flow of net and gross foreign aid it can obtain
during the "period of transition", (c) the saving it can offer itself
out of its disposable income, (d) the incremental output-capital ratios
in "traditional" production and in import-substitution, (e) the various
technological and/or behavioural requirements of "importables", and
(f) the projection of the country's export earnings. In doing so we
have made several simplifying assumptions each of which can be individually
criticized. The methodological problem in long-term planning is not
however to formulate assumptions that individually represent reality
accurately; it is instead to seek the assumption-mix that best represents
the structure of reality in its broad outlines and is operational. It
is in this direction that the present paper has attempted a modest
contribution. Furthermore, by putting into the orbit some basic notions
that may help articulate more clearly than ever the problem in issue, we
hope to have laid the framework on which more sophisticated models can
be built.

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