

ECONOMIC GROWTH CENTER

YALE UNIVERSITY

Box 1987, Yale Station
New Haven, Connecticut

CENTER DISCUSSION PAPER NO. 331

TRADE, GROWTH AND INCOME REDISTRIBUTION: A CASE STUDY OF INDIA

Sharif Mohammad

November 1979

Notes: Center Discussion Papers are preliminary materials circulated to stimulate discussion and critical comment. References in publications to Discussion Papers should be cleared with the author to protect the tentative character of these papers.

Portions of this research were financed by the Ford Foundation.

Trade, Growth and Income Redistribution: A Case Study of India^{*}

Sharif Mohammad **

The choice between the outward-looking (export-oriented) and inward-looking (import-substituting) strategies of economic development has been a theme of contention for the economists as well as policymakers during the last more than two decades. In the context of developing economies, foreign exchange and savings are two of the most important factors limiting the rate of growth of the economy. The availability of foreign exchange in the economy is determined by the performance of its foreign trade sector. Trade affects not only the quantum of foreign exchange earnings but also the income distribution (and thus savings) in the economy, through the reallocation of resources to different sectors and industries. Therefore, the total impact of trade on economic growth is likely to be substantial.

Import substitution (IS) and export diversification (ED) are two important types of trade policies and the present exercise is concerned with the assessment of these policies in achieving economic growth and income equality. A link between growth and equality is provided through employment. If there is substantial increase in employment, the inequality of income distribution is likely to be reduced. Thus, trade by bringing about higher levels of production and employment may reduce income inequality. The other aspect of the inter-relationship between trade, growth and redistribution of income, i.e. the effect of redistribution on trade and growth,

^{*} Thanks are due to Professors Ajit K. Dasgupta and V. R. Panchamukhi and to Dr. Raghav Gaiha for their helpful comments and suggestions.

^{**} Institute of Economic Growth, Delhi. Presently, Visiting Fellow, Economic Growth Center, Yale University

has also been brought into focus in this exercise. In order to assess these trade policies in quantitative terms, we estimated the effects of changes in the growth of exports and imports on the growth of gross domestic output (G.D.P.), savings, and employment in the Indian economy.

It is clear from the past experience of many countries that industrial growth of the import-substituting-type has been highly capital intensive in nature and has generated relatively little employment opportunities. Many economists have emphasized that countries adopting import-substituting industrialization policies have experienced a worsening of the factor-price-distortions and a reduction in the labour absorption.¹ These countries indirectly redistribute incomes in favour of the manufacturing sectors and against the generally poorer agricultural sector. In the Indian context, Ahmad (1968) has shown that during the first three Five Year Plans import substitution contributed a large proportion of the growth of output. Moreover, the capital intensive industries contributed the major portion of this import substitution.²

It has been realized with increasing anxiety that "even relatively high rates of increase in overall production have not always yielded an adequate rate of expansion in employment and that partly as a corollary to this, the process of growth has sometimes accentuated inequalities in the distribution of income."³

¹For example, Lewis (1973), Krueger (1972), and Little, Scitovsky and Scott (1970).

²Some of the important studies on import substitution in the Indian economy are: Desai (1969, 1972), Bhagwati and Wibulswadi (1972), Bhagwati and Desai (1970), Hazari (1967), Reddaway (1962), and Bhagwati and Srinivasan (1975).

³United Nations (1973).

It is often suggested that for developing countries the promotion of labour intensive manufactured exports is a powerful antidote to this condition, a view that recent experience in the Far-East appears to endorse. Ranis (1973) calls it as "conventional wisdom" which involves the growth of labour intensive export-oriented manufactures as a possible "panacea" for labour surplus developing economies. However, the empirical evidence provided by Lary (1968), Watanabe (1972) and many others shows that only small and medium sized countries have an option of relying predominantly on an exporting strategy as the major means of increasing employment, as these countries face fairly elastic international demand for most of their exports. Nevertheless, even in large countries production according to comparative advantage is likely to yield employment pay-offs.¹

As far as the relationship between economic growth and income distribution is concerned, one may have two different kinds of relationship in mind, viz., the effect of economic growth on income distribution and that of income redistribution on economic growth. This exercise is primarily concerned with the latter. Kuznets (1955), Lewis (1954) and Fei and Ranis (1964) are of the opinion that the distribution of income in a labour surplus developing economy would tend to become more unequal with growth. But none of these theories is able to give any firm theoretical justification for such an expectation. In fact, rapid economic development may lead to a highly unequal distribution of Income in some countries but a more even distribution in some other countries; this may happen as a result of their adopting different sets of policies.

¹The Chinese experience may be relevant here; see Haq (1971).

Regarding the effects of income redistribution on economic growth, the dominant view in the recent literature seems to be one of a trade-off between growth and equality. This view assumes that an unequal income distribution stimulates growth because recipients of higher income save relatively more than the lower income groups.¹ Our study attempts to estimate the magnitude of such a trade-off between growth and equity.

The Methodology:

In recent years, a number of studies have been undertaken in which hypothetical income distributions have been used to analyse the effects of income redistribution on economic growth. The models of this set have combined savings and consumption functions according to income groups, input-output relationships, and factor coefficients to determine these effects.² Another set of models in this context attempts at estimating the effects of different policy instruments on income distribution.³ Our model belongs to the first set.

The model used in this study is a standard closed static input-output model.⁴

¹On the contrary, some economists are of the opinion that an unequal distribution of incomes retards economic growth and that a less unequal distribution would result in a 'widened market' due to a shift of demand from sophisticated capital intensive goods to basic labour intensive mass consumption goods.

²Some such models are those of Cline (1972), Chinn (1973), Foxley (1973), Lopes (1972), Moorley and Smith (1973), Ballentine and Soligo (1974), Reyonlds (1974), Soligo (1973), Talkman (1973), Weisskoff (1973), Pyatt, et al. (1972), Pauckert and Skolla (1972), and India's Fifth Plan Model (1973).

³This set includes the models given by Ahluwalia and Chenery (1974), Moorley and Williamson (1973), Fishlow (1972) and Adelman and Robinson (1973).

⁴The basic version of this model was first applied to Iranian economy by Pyatt, et. al. (1972).

This methodology for studying the effects of income-redistribution has the following basic features:

- (a) a pattern of redistribution is assumed, based on some social objectives such as targets for the lowest group, and taxation possibilities, etc.;
- (b) the impact of redistribution on savings and investment is estimated from aggregate consumption functions for each group plus assumptions as to capital flows from and into the economy;
- (c) by using demand functions the total consumption of each income group is distributed into its components;
- (d) the resulting levels of total consumption for each commodity are used to determine changes in production, imports and employment through an input-output system and these changes are compared with initial estimates without redistribution; and
- (e) second round effects, as in Pyatt's model, are estimated by an iterative procedure feeding the effects of changed factor payments back into the consumption vector and following through the Solution.

An important application of this methodology is to estimate the effects of a hypothetical income redistribution on the factors limiting growth of output, domestic savings, external capital flows and foreign exchange. Once these effects are determined, the effect on total output can also be estimated. To some extent, the Indian Planning Commission's Fifth Plan Model (1973) is an off-shoot of this methodology and using it the Commission

arrived at some very interesting results such as, in 22 sectors out of 66 sectors consumption redistribution causes a change in annual growth rate by more than 1 percent. The effects of redistribution of consumer expenditure on sectoral output levels have been simulated. But this model has neither made consumption endogenous as in Pyatt's model nor does it endogenize the investment requirements to transform the output capacity, like Manne and Rudra (1965).

The present model is based on that developed by Pauckert, Skolka and Maton (1974) which is also based on Pyatt's methodology. In its most general formulation the model can be written as:

$$B \cdot Z = F \quad (1)$$

B is a square matrix consisting of structural coefficients of the model.

Z is a column vector of the endogenous variables, and

F is a column vector of exogenous variables (or components of final demand).

The solution of the model is given by the following equation:

$$Z = B^{-1} \cdot F \quad (2)$$

The arrangement of different components of the B-matrix can be explained:

I - A	0	-C	0
-M		$-M_C$	
0		-S	0
$-V_A$		0	
0	0 I*	I	0
-L	0	0	I
-R			

where, A = a square matrix of order $n \times n$ of input coefficients for domestically produced intermediate inputs. The elements of A are defined as:

$$A_{ij} = \frac{X_{ij}}{X_j} \quad (i, j = 1, 2, \dots, n) \quad (3)$$

n is the number of sectors (or industries) in the input-output table.

X_{ij} = intermediate deliveries of domestic output of industry i to industry j .

X_j = gross output of industry j .

M = a row vector of order n of input coefficients for intermediate imports. Elements of this vector are defined as:

$$M_j = \frac{m'_j}{X_j} \quad (4)$$

m'_j = intermediate inputs by industry j .

V_A = a matrix of order $p \times n$ of value added coefficients which are defined as:

$$V_{pj} = \frac{W_{pj}}{X_j} \quad (5)$$

W_{pj} = components of value added in j th industry (or sector).

Value added in a sector may be divided into three components - personal income, other value added and total value added.

Personal incomes are appearing in the last row in order to link it with the vector of the stipulated income distribution.

L = is a row vector of order n consisting of employment coefficients which may be defined as:

$$l_i = \frac{l'_j}{x_j} \quad (6)$$

where l'_j is employment in j th industry.

C = is a matrix of order $n \times k$ of private consumption expenditure pattern by income groups. The elements of this matrix are estimated as below:

$$c_{ik} = \frac{e_{ik}}{Y_k} \quad (7)$$

$i = 1, 2, \dots, n$

$k = 1, 2, \dots, k$

e_{ik} = is the expenditure on private consumption of commodity i by income group k .

Y_k = total personal income in the k th income group.

M_c = a row vector of k elements representing direct import coefficients for private consumption. Elements of this vector are:

$$m_{ck} = \frac{e_{mk}}{Y_k} \quad (8)$$

e_{mk} = private consumption of direct imports in the income group k .

S = a row vector of order k representing savings coefficients which are defined as below:

$$s_k = \frac{S'_k}{Y_k} \quad (9)$$

S'_k = are the private savings in the k th income group.

By definitions it is obvious that

$$\sum_{i=1}^N e_{ik} + e_{mk} + S'_k = Y_k \quad (k = 1, 2, \dots, k) \quad (10)$$

and

$$\sum_{i=1}^N c_{ik} + m_{ck} + S_k = 1 \quad (k = 1, 2, \dots, k) \quad (11)$$

I^* = column vector of k ($k = 10$ in the present case) elements of stipulated income distribution pattern by size (i.e. the ten deciles). Elements of this vector, corresponding to the actual income distribution in the base year are defined as:

$$I_k = \frac{Y_k}{Y} \quad (12)$$

Y = total annual personal income.

R = row vector of Incremental Capital-Output Ratios

(ICORS) R_j .

I = Identity matrices of different orders.

O = Null matrices and vectors of different orders.

The order of the square matrix B turns out to be $(n + k + p + 3 + 1)$.

The column vector of Exogenous variables (F) consists of the following elements:

- (i) n values of other final demand (i.e. public consumption, fixed capital formation, changes in stocks, and exports of domestic output of the n -industries).
- (ii) one value of direct imports for other final uses (other than private consumption and input-use).
- (iii) a number of zeros (in order to make F vector consistent with the size of the matrix B).

The solution vector of Endogenous variables (Z) contains the following elements:

- (i) N values of gross output by industry.
- (ii) the sum of intermediate imports and of total direct imports for private consumption.
- (iii) total private savings.
- (iv) totals of value added components.
- (v) K values of total personal income by income groups.
- (vi) total employment; and
- (vii) one value of total stock of capital estimated from the ICORs.

Main assumptions of the Model:

Some of these assumptions are standard ones generally applied in a static Leontief-model; others are specific to the present version of it.

- (i) Each sector (identified with a production function) produces a single product thus ruling out joint products.
- (ii) The technological coefficients are fixed and there is no possibility of substitution among factors of production. This simply means that a product can be produced in only one way.¹
- (iii) The next assumption is that there are no interactions between sectors; thereby implying negligible economies and diseconomies of production.
- (iv) Another important assumption of a standard Leontief model is that

¹When we vary income distribution we assume constant technology (i.e. input-output coefficient). However, the techniques are related to income distribution; hence technology is not independent of income distribution.

the input used in production by any sector is proportionate to the level of output of that sector and the constant of proportion represents the corresponding technological coefficients.

(v) In addition to the assumptions (i) to (iv), we have also assumed no capacity limitations.

(vi) Changes in prices and wages are not taken into consideration.

Our study is a Static Comparative Simulation Exercise, analysing hypothetical equilibrium states of the Indian economy under alternative assumptions about the personal income-distribution and the degree of import substitution and the export expansion/diversification. The model shows what the equilibrium state of the economy would look like under different alternatives.

In the present model, which is based on a Keynesian linear-savings-function and a Leontief consumption-output-matrix multiplier, income redistribution should lead to a change in total private savings. We may ex-ante, expect that a more equitable income redistribution would lead to a lower level of private savings. On the other hand, the increase in domestic output would increase personal incomes and might allow some increase in private savings. However, the net change in aggregate private savings might turn out to be positive, negative or zero.

Alternative solutions may be obtained by changing any of the following variables:

1. Income distribution vector may be replaced by stipulated income redistributions having different coefficients.
2. Imports for intermediate uses and for private consumption purposes may be altered to study the effects of import-substitution and

correspondingly changing the coefficients of input-output-matrix (A) and consumption proportion matrix (C).

3. Export vector (which is a component of other final demand - F) can be changed in two ways - firstly, by changing the exports originating from all the sectors at the same rate, and secondly, by taking different rates of change for traditional and non-traditional items of exports. Broadly, these two alternatives amount to export-expansion and export-diversification, respectively.

The changes in the above variables separately as well as in combination provide us a large number of solutions of the model which may be interpreted accordingly.

Sources of Data

We have used the 66-sector classification used by the Indian Planning Commission for the Fifth Five Year Plan. Some of the important sources of data used in the present exercise are the following:¹

(i) The Planning Commission of India: For data on input-output coefficients for the year 1973-74, associated import coefficients, and value added by sectors.

(ii) Annual Survey of Industries (ASI).

(iii) National Sample Survey (NSS): ASI and NSS Reports for different years have been used for estimating the labour output ratios for the manufacturing sectors.

(iv) M.R. Saluja, and

(v) Eckaus and Parikh: For data on capital-output ratios.

¹For a detailed description of the data, see author's unpublished Ph.D. thesis entitled Trade, Growth and Income Equality: A Case Study of India, submitted to the University of Delhi, December, 1977.

(vi) National Council of Applied Economic Research (NCAER):

For data on private consumption, income distribution and savings, we have used the NCAER Report on All India Survey of Consumer Expenditure, Income and Savings (1975).

Results

We solved the model with Indian data for 1973-74. Our first solution is obtained by using the actual data and we call it as "Basic Solution". All other solutions based on different alternative assumptions have been compared with the "basic solution".

1. Effects of Redistribution of Income: The ten stipulated income distributions along with their Gini-coefficients have been presented in Table I. The first distribution is an observed one for the Indian economy and taken from NCAER (1975) referring to year 1967-68. The other distributions are hypothetical. The first distribution has been slightly modified such that negative savings in the two lowest income groups are replaced by zero savings. This is done to overcome the difficulty in operating the model with negative elements.

Effects on Employment: The results show that redistribution of income in favour of the lower income groups results in an increase in total employment G.D.P. and personal income. Employment shows a relatively higher increase, viz., 8.5 percent for the most drastic redistribution (i.e. for the tenth distribution). The G.D.P. and personal income increase by 5.3 percent and 7.3 percent, respectively. Since employment shows a higher increase, these results also suggest that the G.D.P. per employed person and personal income per employed person would decline as a result of redistribution of income. This decline in productivity (defined as G.D.P. per worker) as a

result of a shift of income distribution in favour of lower income recipients may be explained by the fact that such a change in income distribution causes a change in the structure of production. The structure of production is shifted in favour of those industries which are employing less productive labour and also low paid workers. Such a change in the structure of production is induced through a change in the pattern of consumer demand caused by the shift in income distribution in favour of lower income groups (Table II).¹

The impact of income redistribution on employment is not direct; it is transmitted through changes in the level of private savings, through changes in the structure of output, and through changes in the degree of dependence upon imports. The relative importance of these effects may be different. However, the structure of our model does not permit us to empirically estimate these effects separately. It seems that the effect of redistribution on employment through changes in the volume and pattern of private consumption (and hence a shift in the production structure) is quite substantial. For example, our results suggest that for the 10th distribution alternative the production of Foodgrains increases by 30.5 percent, and that of Other Food Products, Fertilizers and Vegetable oils increases by over 16.0 percent each.

The elasticity of employment with respect to the concentration of income (measured by the Gini-coefficient) is a measure of their relationship.

¹Skolka and Garzuel (1976) arrived at similar results for the Iranian economy.

This elasticity has been computed by carrying out a log-linear regression analysis and turned out to be .4 which means that a 10 percent change in income distribution (i.e. 10 percent decline in the value of Gini-ratio) would be associated with a 4 percent change in employment.¹

Effects on Savings

It is generally believed that any attempt to redistribute income in favour of the lower income recipients results in a decline in the level of private savings in the economy. This argument is based on the consideration that since lower income groups have a lower propensity to save as compared to the higher income earners, a transfer of income from the higher to the lower income groups leads to a lower level of savings. Table III shows that this argument holds true for the Indian economy. For the 10th alternative aggregate private savings decline by about 15 percent as compared to our basic solution.

Our results also show (Table IV) that not only do aggregate savings decline as a result of redistribution but the share of savings in the total personal income also goes down with decreasing values of the Gini-coefficient; the share of savings in the personal income declines from 13.1 percent for the basic solution (Alternative I) to 10.5 percent for the 10th Alternative.

Effects on Growth

The adverse effect of redistribution on savings is ultimately reflected in a declining growth of the gross domestic product of the economy. This

¹The estimation equation was:

$$\text{Log Employment} = 1.211 - .441 \log \text{ Gini Coefficient, } R^2 = .99 \\ (.024) (.057)$$

has been shown by our results in Table V. For the 10th Alternative the capital stock has increased by 10.0 percent while the G.D.P. has increased by only 5.3 percent, correspondingly. The implied growth rates of G.D.P., estimated by matching savings with the capital stock, are represented in Table V. It is clear from this table that the growth rate is declining with increasing equality. The results also show that with reduction in inequality, private savings decline while the capital requirements increase. For the 10th Alternative this gap becomes substantially wide. Now public savings is the only source to fill up this gap and meet the additional investment requirements. However, this particular aspect, viz. the mode of financing the required investment is beyond the scope of this exercise.

The implied rates of growth of employment have been estimated by dividing the absolute increase in employment resulting from redistribution by the total initial employment. The absolute increase in employment is arrived at by dividing the absolute increase in the G.D.P. (Table II) by the G.D.P. per employed person (Table IV). Due to the assumption of constant coefficients of the model the implied growth rates of employment are more or less the same as those for the G.D.P.. Table VI presents the implied growth rates of employment as a result of redistribution.

In the present exercise, income distribution is the main factor which affects the level of employment. This effect is transmitted through four factors: (a) through changes in the level and pattern of private consumption, (b) through complimentary changes in the private savings, (c) through changes in the structure of output, and (d) through changes in the degree of dependency on imports. The structure of our model, however, does not permit us to separate out these four effects and it seems that the first factor that is through changes in the pattern of private consumption is most important.

Effects on Trade:

While simulating our model to see that effects of redistribution, exports have been kept constant. Since the G.D.P. rises with more equitable redistribution, the share of exports in G.D.P. declines. It is also possible that due to increased levels of consumption, as a result of redistribution, exports may decline particularly in those sectors where increase in domestic consumption is substantial. However, imports show a rise with redistribution. This increase in imports may be due to increased input requirements for production. In an economy such as India's, where imports are completely regulated by the state, we may hardly expect any increase in imports for consumption purposes (which are very low due to very high import duties and other restrictions).

2. Effects of Changes in Foreign Trade

The trade policies of a country may be quantified, to a large extent, in terms of the quantity of exports and imports. The effectiveness of these policies in respect of the growth of output, employment and redistribution may be evaluated by analysing the effects of changes in the quantity and composition of both exports and imports. For example, a programme of export promotion/or diversification may affect significantly the pattern of production which, in turn, will affect the level of employment and income distribution in the economy.

Effects of Changes in Exports

The recent high increase in Indian exports is significant both as regards the volume and composition. There has been a greater emphasis on export promotion with the objective of earning more foreign exchange to meet the increasing demand for imports and to utilize the excess capacity in

some of the important industries such as: sugar, leather products, iron and steel, textiles and electrical appliances, etc.¹ Any substantial changes in the exports of the country are likely to affect the production and employment and thus the income distribution. The two important aspects of the effects of changes in exports on the rest of the economy are: (1) Effects of changes in the volume of exports; and (2) effects of changes in the pattern (or composition) of exports.

For analysing the former type of effects we have assumed four alternative rates of growth of exports, viz., 5.0, 10.0, 15.0 and 20.0 per cent per annum. For the latter type of effects, we have divided our exports into two groups - traditional exports and non-traditional exports. Exports originating from agricultural sectors, mining, and textiles are included in the first group and exports from manufacturing sectors into the second group.

It is found that even 20.0 percent increase in the volume of exports brings about only small increases in employment (3.44 percent) in G.D.P. (3.26 percent), in personal income (3.34 percent) and in savings (3.36 percent). For a 20.0 percent increase in exports the import-requirements also increase but only marginally (1.85 percent); Tables VIIA and VIIB.

In case of export diversification we arrived at more or less the same results as for export expansion. This, however, might be due to the fact that the aggregation of exports into traditional and non-traditional

¹For a detailed analysis, please see Banerjee (1977).

groups is not sensitive to changes in the pattern of exports. The effects of export-diversification could be highlighted (as distinct from expansion of exports) by assuming different growth rate for each exporting sector and without much aggregation of sectors.

Effects of Changes in Imports

To analyse the effects of changing degree of import-substitution in the Indian context, we have assumed four different alternatives - 5.0%, 10.0%, 15.0% and 20.0 percent per year reduction of imports (for input use and private consumption) and substituting these imports with domestic production. We find that a 20.0 per substitution of imports results in 1.30 percent increase in employment, 1.42 percent increase in personal income, 1.42 percent increase in savings and 1.37 percent increase in the G.D.P., (Tables VIIA and VIIIB).

Implied growth rates of G.D.P. and employment associated with our assumptions about import substitution are not very large and these rates of growth decline with increasing substitution of imports. However, import substitution alongwith redistribution would have substantial effects on the rest of the economy, i.e., a 20 percent substitution of imports with 10th redistribution alternative results in a 14 percent reduction in the level of savings, 10 percent increase in employment, 9 percent increase in personal income and 7 percent increase in the G.D.P.

The results of the present exercise thus suggest that a 20 percent increase in exports has a larger impact on employment, the G.D.P., personal income and savings than the same increase in import substitution has.

Conclusions

The main conclusions derived from our analysis are: firstly, redistribution of income in favour of lower income groups results in higher levels of employment, total gross domestic product, and personal income. However, total private saving and hence the growth rate of G.D.P. decline as a result of redistribution. The results support the general belief that there is always a trade-off between growth and equity.

Secondly, it can also be found from our results that export promotion is more favourable to the generation of higher employment and income as compared to import substitution. This finding is supported by another exercise [Mohammad (1976)] that exports from India have a lower skill intensity than the import replacements have. Since skills tend to be positively correlated with wages, the expansion of import-substituting industries would result in relatively higher inequality in incomes while the expansion of exporting industries would have an opposite effect.

Finally, it may also be concluded from our exercise that a strategy of redistribution along with the expansion of labour intensive exports would result in a pattern of production which would be efficient in meeting the basic needs and lead to increased integration of the national economy and greater self-reliance. Such a strategy would also lead to greater domestic production of essential food and consumer goods.

Table I: Income Distribution Alternatives

Income deciles	I	II	III	IV	V	VI	VII	VIII	IX	X
1	1.80	2.68	2.04	2.00	2.92	2.00	3.81	3.00	2.13	3.00
2	3.00	3.92	2.84	2.50	3.64	3.00	4.43	4.00	4.44	4.00
3	3.71	4.88	4.24	4.00	4.88	4.50	5.52	5.00	6.16	5.00
4	4.64	5.83	4.78	5.00	5.36	5.50	5.94	6.00	7.28	7.50
5	5.78	6.72	7.12	7.00	7.44	8.50	7.76	8.00	8.32	9.50
6	7.04	7.65	7.48	9.00	7.76	9.50	8.04	10.00	9.48	11.50
7	8.97	8.75	9.01	11.0	9.12	11.0	9.23	11.00	10.86	12.50
8	11.81	10.37	11.17	13.00	11.04	13.00	10.91	13.00	12.52	14.00
9	16.76	14.09	13.78	17.00	13.36	15.00	12.94	14.00	15.05	16.00
10	36.49	35.11	37.54	29.50	34.48	28.00	31.42	26.00	23.76	17.00
Gini-coffi- cient	.4633	.4100	.444	.414	.394	.378	.345	.324	.312	.272

Table III: Implications of Stipulated Alternatives
of Income Distribution - Comparison with Alternative 1.

Income Distribution Alternative	Employment	G.D.P.	Personal Income	Personal Savings	Imports
1	1.000000	1.000000	1.000000	1.000000	1.000000
2	1.029214	1.015612	1.025039	.984052	1.000521
3	1.011143	1.006813	1.009957	1.005476	.999809
4	1.019940	1.013961	1.017381	.954625	.999435
5	1.032590	1.018466	1.028174	.979283	1.000338
6	1.038124	1.024820	1.033205	.940820	.999248
7	1.054814	1.030547	1.047061	.952127	1.000888
8	1.058804	1.036205	1.050923	.918629	.999917
9	1.067714	1.040177	1.058196	.904783	.999804
10	1.084856	1.052743	1.073047	.854457	.999457

Table II: Implications of Stipulated Alternatives of Income Distribution

Income Distribution Alternative	Employment (In Millions)	G.D.P. (at Factor cost)	Personal Income	(Rs. million)	
				Savings (Personal)	Imports
1	79.688	368134.375	141231.688	18558.113	17889.840
2	82.016	373881.875	144767.938	18262.141	17899.164
3	80.576	370642.625	142637.875	18659.746	17886.430
4	81.277	373273.875	143686.500	17716.043	17879.727
5	82.285	374932.313	145210.750	18173.648	17895.891
6	82.726	377271.563	145921.313	17459.848	17876.391
7	84.056	379379.625	147878.250	17669.676	17905.723
8	84.374	381462.625	148423.688	17048.027	17888.348
9	85.084	382924.813	149450.813	16791.066	17886.328
10	86.450	387550.875	151548.250	15857.105	17880.133

Table IV: Implications of Stipulated Alternatives of Income Distribution (continued)

Income Distribution Alternative	G.D.P. per Employed Person (Rs.)	Personal Income per Employed Person (Rs.)	Share of Private Savings in Personal Income	Share of Personal Income in G.D.P.	Share of Exports in G.D.P.	Share of Imports as Share of G.D.P.
1	4619.70	1772.31	.131402	.383642	.050682	.048596
2	4558.65	1765.12	.126148	.387202	.049903	.047874
3	4599.91	1770.23	.130819	.384839	.050339	.048258
4	4592.61	1767.86	.123297	.384936	.049984	.047900
5	4556.51	1764.73	.125154	.387299	.049763	.047731
6	4560.50	1763.91	.119652	.386781	.049455	.046279
7	4513.42	1759.28	.119488	.389790	.049180	.047197
8	4521.09	1759.12	.114861	.389091	.048911	.046894
9	4500.55	1756.51	.112352	.390288	.048724	.046710
10	4482.95	1753.02	.104634	.391041	.048143	.046136

Table VI: Income Distribution and Employment Growth

Income-Distribution Alternative	Employment (Millions)	Implied Growth in Employment	
		Annual Increase in Employment (Millions)	Annual Percentage Rate of Growth
1	79.688	3.54	4.44
2	82.016	3.51	4.28
3	80.576	3.56	4.42
4	81.277	3.39	4.17
5	82.285	3.49	4.24
6	82.726	3.35	4.05
7	84.056	3.42	4.07
8	84.374	3.29	3.90
9	85.084	3.25	3.82
10	86.450	2.99	3.46

Table V: Income Distribution and Growth in G.D.P.

Income Distribution Alternative	G.D.P. (Rs. Million)	Capital/Output Ratio	Capital Stock Estimated from ICOR's (Rs. Million)	Annual Absolute Increase (Rs. Million)	Implied Growth in G.D.P. Annual Percentage Rate of Growth
1	368134.375	1.1354	417987.13	16345.17	4.44
2	373881.875	1.1413	426706.56	16002.14	4.28
3	370642.625	1.1382	421854.94	16382.40	4.42
4	373273.875	1.1379	424950.13	15565.52	4.17
5	374932.31	1.1419	428128.88	15897.13	4.24
6	377271.563	1.1419	430795.63	15279.50	4.05
7	379379.625	1.1456	434632.88	15440.75	4.07
8	381462.625	1.1456	437006.13	14877.04	3.90
9	382924.813	1.1469	439159.88	14627.73	3.82
10	387550.875	1.1816	457947.63	13409.26	3.46

Table VIIA: Implications of Export Growth :
Distribution Alternative 1

(Rs. million)

Export-Expansion (%)	Employment (in millions)	G.D.P.	Personal Income	Personal Savings	Imports
0.0	79.688	368134.375	141231.688	18558.113	17889.840
5.0	80.373	371138.125	142415.813	18713.715	17972.723
10.0	81.057	374142.000	143599.938	18869.320	18055.617
15.0	81.741	377145.688	144784.125	19024.918	18138.504
20.0	82.426	380149.250	145968.250	19180.512	18221.395

Table VIIB: Implications of Export Growth - Comparison
with Basic Solution

Export-Growth per cent per Annum	Employment	G.D.P.	Personal Income	Personal Savings	Imports
0.0	1.000000	1.000000	1.000000	1.000000	1.000000
5.0	1.008596	1.008159	1.008384	1.008385	1.004633
10.0	1.017180	1.016319	1.016769	1.016769	1.009267
15.0	1.025763	1.024478	1.025153	1.025154	1.013900
20.0	1.034359	1.032637	1.033538	1.033516	1.018533

Table VIIIA: Implications of Import Substitution:
For Distribution Alternative I

Import-substitution per cent per annum	Employment (Millions)	G.D.P.	Personal Income	Savings	Imports
0.0	79.688	368134.375	141231.688	18558.113	17889.840
5.0	79.968	369373.000	141727.188	18623.230	17492.402
10.0	80.251	370623.750	142227.313	18688.941	17091.297
15.0	80.537	371885.875	142732.000	18755.258	16686.449
20.0	80.825	373159.625	143241.125	18822.168	16277.789

(Rs. Million)

Table VIIIB: Implications of Import-substitution:
Comparison with Basic Solution

Import-substitution per cent per annum	Employment	G.D.P.	Personal Income	Savings	Imports
0.0	1.000000	1.000000	1.000000	1.000000	1.000000
5.0	1.003514	1.003365	1.003508	1.003509	0.977784
10.0	1.007065	1.006762	1.007050	1.007050	0.955363
15.0	1.010654	1.010191	1.010623	1.010623	0.932733
20.0	1.0142681	1.013651	1.014228	1.014229	0.909890

References

- Adelman, I. and Robinson, S. (1973): A Nonlinear Dynamic Microeconomic Model of Korea: Factors Affecting the Distribution of Income in the Short-Run. Research Programme in Economic Development, Discussion Paper No. 36, Princeton University.
- Ahluwalia, M. and Chenery, H.B. (1974): A Conceptual Framework for Economic Analysis, in Redistribution with Growth (eds. Chenery, et. al.) Oxford University Press.
- Ahmad, J. (1968): Import-Substitution and Structural Change in Indian Manufacturing Industry. The Journal of Development Studies, Vol. IV No. 3.
- Balletine, J. and Soligo, R. (1974): Consumption and Earnings Pattern and Income Distribution. (Mimeographed) Programme of Development Studies, Rice University.
- Banerjee, N. (1977): Exports and Indian Economy. Economic and Political Weekly, Vol. XII, No. 16, April.
- Bhagwati, J. and Desai, P. (1970): India: Planning for Industrialization, Oxford-Unwin Press, London.
- _____ and Srinivasan, T.N. (1975): Foreign Trade Regimes and Economic Development, India. NBER, New York.
- _____ and Wilbulswadi, C. (1972): A Statistical Analysis of Shifts in the Import Structures in LDC's. Bulletin of Oxford University Institute of Statistics, May.
- Chinn, D. (1973): Potential Effects of Redistribution on Economic Growth Constraints: Evidence from Taiwan and South Korea, Ph.D. Thesis, California University, Berkeley.
- Cline, W. R. (1972): Potential Effects of Income Redistribution on Economic Growth: Latin American Cases: Praeger, New York.
- DeSai, P. (1969): Alternative Measures of Import Substitution. Oxford Economic Papers, November.
- _____ (1972): Import Substitution in Indian Economy. The Hindustan Publishers, Delhi.
- Fei, J. and Ranis, G. (1964): Development of Labour Surplus Economy: Theory and Policy. Irwin Homewood.
- Fishlow, A. (1973): Brazilian Size Distribution of Income—Another Look, (mimeographed).
- Foxley, A. P. (1973): Redistribución del Consumo: Efectos Sobre la Producción y el Empleo. Paper for ECIEL Conference on Consumption, Income and prices. Hamburg.

- Hazari, B. R. (1967): The Impost Intensity of Consumption in India. The Indian Economic Review, October.
- Haq, Mahlmhul (1971): Employment in the 1970's: A New Perspective. International Development Review, Vol. 13, No. 4, December.
- Johnston, B. F. and Cownie, J. (1969): The Seed-Fertilizer Revolution and Labour Force Absorption. American Economic Review, Vol. LXIX, September.
- Krueger, A. O. (1972): Exchange Control, Liberalization and Development: Turkey. (Mimeographed), University of Minnesota.
- Kuznets, S. (1955): Economic Growth and Income Inequality. American Economic Review, Vol. 45 No. 1.
- Lary, H. B. (1968): Imports of Manufactures from Less Developed Countries. NBER. Columbia University Press, London and New York.
- Lewis, W. A. (1954): Economic Development with Unlimited Supplies of Labour. The Manchester School, No. 22.
- Lewis, R. S. (1973): Agricultural Taxation and Intersectoral Resource Transfers. Food Research Institute Studies, Vol. 12, No. 2.
- Little, I.M.D., Scitovsky, T. and Scott, M. (1970): Industry and Trade in Some Developing Countries, A Comparative Study. OECD, Oxford Univ. Press, London.
- Lopes, F. R. (1972): Inequality Planning in the Developing Economy, Ph.D. Thesis, Harvard University
- Maune, A. S. and Rudsa, A. (1965): A Consistency Model of India's Fourth Plan. Sankhya, Series B. pp. 57-144.
- Moorley, S. and Smith, G. (1973): The Effects of Changes in the Income, Labour, Foreign Investment and Growth in Brazil, in Authoritarian Brazil: Origins, Policies and Future. Yale University Press, New York.
- Moorley, S. and Williamson, J. G. (1973): The Impact of Demand on Labour Absorption and the Distribution of Earnings: The Case of Brazil. Program of Development Studies, Paper No. 39. Rice University, Uston, Texas.
- National Council of Applied Economic Research (1975): All India Household Survey on Income, Savings and Consumer Expenditure, New Delhi.
- Pauckert, F. and Skolka, J. (1972): Redistribution of Income, Patterns of Consumption and Employment: A Framework of Analysis, (Mimeographed), I.L.O. Geneva, August.
- Pauckert, F., et. al. (1974): Redistribution of Income, Patterns of Consumption and Employment: A Case Study of the Philippines. Working Paper of the World Employment Programme Research, I.L.O. Geneva, May.

- Planning Commission of India (1973): A Technical Note on the Approach to the Fifth Plan of India 1974-79. New Delhi.
- Pyatt, G., et. al. (1972): A Methodology for Development Planning Applied to Iran, (Mimeo). I.L.O. Mission, Warwick, England, February.
- Ranis, G. (1973): The Exchange Constraint on Development--A Partial Solution to the Problems: Comment. The Economic Journal, Vol. LXXXIII.
- Reynolds, C. (1974): The Recent Evolution of Savings and the Financial System in Mexico in Relation to the Distribution of Income and Wealth, (mimeo), Stanford University, California.
- Soligo, R. (1973): Factor Intensity of Consumption Patterns, Income Distribution and Employment Growth in Pakistan. Programme of Development Studies Paper No. 44, Rice University Houston.
- Skolka, and Garzuel, (1976): Changes in Income Distribution, Employment and Structure of the Economy: A Case Study of Iran. Working Paper No. 45, World Employment Programme Research, I.L.O. Geneva, September.
- Watanabe, S. (1972): Exports and Employment: The Case of Republic of Korea. International Labour Review, Vol. 106, No. 6, December.
- United Nations (1973): The International Development Strategy: First Overall Review and Appraisal of Issues and Policies. Department of Economic and Social affairs, Report of the Secretary General, New York.
- Weisskoff, R. (1973): A Multisectoral Simulation Model of Employment, Growth and Income Distribution in Puerto Rico: A Re-evaluation of Successful Development Strategy, (Mimeographed), Yale University.