

# POLICY SIMULATIONS FOR A TRANSITION FROM AN INWARD-LOOKING STRATEGY TO AN OUTWARD-LOOKING STRATEGY

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*It is now widely acknowledged that the economic reforms programme launched in 1991 was a delayed response to the compulsions of a transition from an inward-looking strategy to an outward-looking strategy that had become inbuilt into the Indian economy as early as the early eighties. However, the continuance of the inward-looking policy regime all through the eighties cost the economy dearly in terms of a deteriorating external balance and in fact can be viewed as the underlying cause for the crisis in the year 1991. It is, therefore, worth examining how the economy would have performed if a strategic transition to an outward-looking policy regime had been implemented in the early eighties itself. To do this, we have first built a computable general equilibrium (CGE) model and used it to generate a historical run for the eighties. The historical run serves as the reference run against which four counterfactual policy simulations for an outward-looking policy regime are compared. Accordingly, this paper is divided into 5 sections. Section I deals with the policy debate and the policy developments in the eighties and defines four policy options for executing the transition to an outward-looking strategy. Section II describes the CGE model used and then discusses the main features of the model generated historical run. Section III outlines the results of the four counterfactual policy simulations corresponding to the four policy options for the eighties. Section IV brings out the policy conclusions that follow from the results of the counterfactual policy simulations. In the final section V, we reflect upon the limitations and the possible extensions of the present modelling exercise.*

## I. INTRODUCTION

In the policy debate on the transition from inward-looking strategy to an outward-looking strategy in India in the eighties (1983-84 to 1991-92) the major policy instruments of an inward-looking strategy can be identified to

be the following : (i) channelizing public investment into import-competing and socially desirable sectors, (ii) regulating the flow of private investment through an elaborate and complex industrial licensing system to reduce the conflict between

private profitability and social objectives, (iii) maintaining an 'overvalued' real exchange rate (RER), where the latter - following Edwards (1988) - has been defined to be the relative price of tradable with respect to non-tradable goods, and (iv) maintaining a high average rate of tariff compounded by a differentiated tariff structure for imports. Managing the size and allocation of public investment (i.e., policy instrument (i)) is compatible with an outward-looking strategy as well, and, in fact public investment led growth continues to be relevant during and after the transition to an outward-looking policy regime. On the other hand, the industrial licensing policy of the government (i.e., policy instrument (ii)) first came under attack much before the eighties and quite independently of the debate on the transition from an inward-looking to an outward-looking strategy. Criticism against the overvalued RER (i.e., policy instrument (iii)) and the high non-uniform tariff rates (i.e., policy instrument (iv)) however, built up only in the early eighties. From the perspective of an outward-looking strategy, high non-uniform tariff rates are seen to result in an unduly high cost industrial structure, which in turn means an erosion of international competitiveness and a bias against exports, and, the latter is manifested (sooner or later) in perpetual balance of payments difficulties. Overvaluation in RER also leads to current account deficits (CAD) that are not compatible with long-run sustainable capital inflows. It follows that in the transition towards outward-orientation policy measures to improve international competitiveness of domestic products and correct the bias against exports must include (a) bringing about a depreciation in the RER and (b) reducing tariff rates on imports, and, the latter must be accompanied by a policy to reduce indirect taxes on domestically

produced inputs to ensure that there is no policy induced incentive for an increased substitution in favour of imported inputs.

In the developments in the Indian economy in the eighties (1983-84 to 1991-92), it is notable that while the performance of the Indian economy in real terms - i.e., as reflected in the growth of real GDP, real GDP per capita, real GDCF, and the agricultural and industrial production indices - improved significantly in comparison to that in the preceding decade (1973-74 to 1982-83), in the external balance (as reflected in the ratio of current account deficit to GDPMP) there has been a considerable deterioration in the eighties. Moreover, the large current account deficits had to be financed mostly by external commercial borrowings because in this period there was also a considerable reduction in the flows of concessional assistance to India (see Ojha (1997)). It follows that the improved growth performance in the eighties was at the cost of an increased burden of external debt and in the long run not sustainable. Not surprisingly, the economy stumbled into a crisis in the year 1991, and the growth process came to a grinding halt.

In the earlier (i.e., pre-eighties) phase of Indian economic development, the policy making was concerned primarily with overcoming constraints imposed by inadequate growth in the agricultural and infrastructural sectors, and import substitution in capital and intermediate goods sectors. Since 1983-84, however, the scope of policy effort has been widened to include measures to increase competitiveness of the Indian products in the world markets. During 1983-84 and 1984-85 these measures comprised mainly of schemes for providing, apart from cash assistance, cheaper (duty free) and

liberal access to imported inputs for the exporters. In the middle and late eighties, the liberalising policy measures consisted of (i) industrial deregulation - licensing requirement for many industries for entry and expansion of capacity was removed; (ii) import deregulation - imports of many capital goods and intermediate goods for 'actual users' were shifted to the Open General License (OGL); and (iii) increased export incentives - the rates of cash assistance and the duty drawback rates were raised. However, these incentives for exports - as shown by Jalan (1991) - did not amount to bringing export profitability from below to at par with (or above) the profitability of supplying in the domestic market, and therefore could not remove the bias against exports that is inherent in an inward-looking strategy. In 1991-92, bolder policy reforms were implemented - licensing was removed for all except a few strategic industries, 'actual user' requirement for imports under the OGL was removed, a major nominal exchange rate devaluation was undertaken, import and import entitlements linked to export earnings (renamed Eximscrips) were made freely tradable in the market. In short, with the exception of the year 1991-92, policy changes in the eighties were too marginal in nature to amount to change over to an outward-looking strategy - i.e., one in which growth in the real sector of the economy is maintained along with reduced (rather than increased) current account deficits.

In line with such a strategy we consider the following four policy options for the eighties:

- (1) bringing about a depreciation of the RER for reducing the current account deficit;
- (2) option (1) *plus* simultaneously, reduc-

ing the tariffs on the imported intermediate inputs as well as the indirect taxes on domestic intermediate inputs;

- (3) an expansionary public investment programme financed by an increase in the direct tax rates;
- (4) option (3) accompanied by a depreciation of the RER for reducing the current account deficit.

For bringing about a depreciation in the RER, we considered two alternatives : (i) nominal exchange rate devaluation and (ii) simultaneous imposition of a uniform import tax (UIT) and a uniform export subsidy (UES). The UIT-cum-UES scheme - like the nominal exchange rate devaluation - would lead to a rise in the relative price of tradable to non-tradable goods and, by implication, a depreciation in the RER, and, the resulting reallocation of resources in favour of tradables would combine with expenditure switching away from tradables to bring about an improved current account balance. Moreover, the UIT-cum-UES scheme may be the preferred option (over nominal devaluation) in the specific context of a transition to an outward-looking policy regime because (i) in the UIT-cum-UES scheme the administered imports of POL products and essential commodities have to be exempted from the UIT so as not to incur higher rupee costs for these imports (note that cost escalation in these imports strengthens the tendency for cost-push inflation in the domestic economy, and this is unavoidable in case of nominal exchange rate devaluation), and because (ii) the implementation of this scheme does not result in increased government expenditure on account of servicing of external debt denominated in foreign currency (while nominal devaluation necessarily results in

increased expenditure on account of debt servicing) . On the basis of these considerations, we have chosen the UIT-cum-UES scheme as the appropriate policy instrument for effecting a RER depreciation in the counterfactual policy simulations in our study.

## II. THE MODEL GENERATED HISTORICAL RUN

To generate an approximation of the actual growth path - of each of the following real macroeconomic variables : gross domestic product at market prices (GDPMP), private consumption (CNS), investment (INV) , exports (EXP) and imports (IMP), of the Indian economy from 1983-84 to 1991-92 - we formulated a computable general equilibrium (CGE) model, calibrated it to a 1983-84 data set, and employed a tracking procedure for the subsequent years. The historical run was obtained by solving a sequence of nine (i.e., one for each of the nine years, 1983-84 to 1991-92) single-year CGE models, and computing the values and the rates of growth of the above macroeconomic variables for each year. The historical run, thus obtained, served as a benchmark against which counterfactual policy simulations could be compared.

The CGE model employed is based on a six sector classification - (1) agriculture, (2) consumer goods, (3) capital goods (including construction), (4) intermediate goods, (5) public infrastructure and (6) services - in which the first four are the tradable sectors, and the last two are the non-tradable sectors. The nominal exchange rate and the world prices are exogenously fixed ; the model, however, allows for an endogenous determination of the UIT-cum-UES rate for an exogenously given level of foreign savings. In the historical run, the UIT-cum-

UES rate is fixed at zero, and, the foreign savings (or the current account deficit) level is determined endogenously. On the other hand, in the simulations, in which the foreign savings level is fixed at a level lower than that in the historical run, the model determines (endogenously) a consistent UIT-cum-UES rate, and, brings about a depreciation in the RER as a consequence of the prices of tradables rising relative to those of the non-tradables.

The aggregate real investment has two constituent parts - public and private real investments - and each of these are exogenously given in the model. The sectoral capital stocks and the total labor supply in the non-agricultural sectors are also exogenously given. (Note that the capital stocks are fixed for a given period (year), but endogenous in the intertemporal sense - that is to say, the sectoral capital stocks in a given year are an outcome of the sectoral capital stocks, depreciations and the real investments undertaken in the previous year).

Since the fixed (sectorwise) supply of capital must be fully employed in production, the profit maximising or cost minimising rule followed by the producers (i.e., the first order condition) determines, not the usage, but the return on capital employed. (Note that there is a nested constant elasticity of substitution (CES) tree-type production function for each sector, and the producers act as profit maximisers or cost minimisers in perfectly competitive markets, i.e., they take factor and input and output prices (inclusive of any taxes) as given and express demands for each of the factors and inputs - at different levels of the tree - so as to minimise unit costs of output). For hired labour, wage rate is indexed to the

consumer price index, and, for self-employed labour, there is a labour market clearing remuneration rate. Factor employment levels times the factor returns give the factor incomes, which are then mapped onto household income.

Private consumption is derived from an expenditure function with a fixed consumption propensity, and then commoditywise consumption demands are generated through an almost ideal demand system. Private savings follow residually from the household budget constraint - according to which total private (household) income is either allocated to private consumption or to private savings.

Export demand is inversely related to its supply price relative to the (exogenously given) world price, where the supply price is nothing but the domestic output price net of the UES. It follows that the export demand is directly related to the UES, given the domestic output price.

Demands for bundles of domestic and imported intermediate inputs are a result of the profit maximising actions of the producers, and, are therefore generated through the first order conditions applicable at the appropriate level in the CES tree. Because the production sectors are inter-linked through a Leontief input-output system, the price of one unit of the bundle of domestic intermediates is the weighted average of the constituent domestic output prices (inclusive of the sector-specific indirect taxes on domestic outputs for intermediate use), with the weights being the relevant Leontief coefficients. Similarly, the price of one unit of the bundle of imported intermediates is a weighted average of the (world) prices of imports, with the weights being the fixed quantity coefficients, and the

constituent prices being inclusive of the sector-specific tariffs on imports for intermediate use and the UIT.

Commodity prices are the (domestic) market clearing prices - i.e., they ensure the fulfillment of the condition that aggregate supply equals aggregate demand for each commodity. Aggregate supply consists of domestic output (plus final imports) and stocks carried over from the previous year, and, aggregate demand consists of demand of the commodity for (domestic) intermediate use, consumption demand, investment demand, government consumption demand, export demand (by the rest of the world) and additions to stocks.

Current account deficit or the foreign savings level is obtained as the excess of payments for intermediate and final imports over the sum of export earnings and transfers from the rest of the world (the latter is exogenously given).

Government savings are obtained as the sum of tax and tariff revenue, less the value of government consumption and transfers (the latter two are exogenously given). All taxes and tariffs are of the ad valorem type, and all the tax and tariff rates are exogenously given.

It is obvious that our model is investment driven - i.e., the investment level is exogenously fixed, and the domestic, foreign and government savings adjust to bring about the savings-investment balance. And, because it is investment driven, there is - for, say, an exogenous increase in investment - a "Keynesian" mode of increase in private savings, through increases in output and income, operating in the model. But, the Keynesian multiplier effects would be limited because the output increase, in our model, is limited by the fixed capital

stock in each of the sectors and the fixed supply of total labor in the urban sectors. (Note that for strong multiplier effects to come about, excess capacity conditions must prevail). However, in addition to the multiplier effects, there would be strong inflationary responses - relative prices may rise leading to a reduction in exports and an increase in imports, which in turn would result in an increase in foreign savings. In other words, in our model, prices (rather than outputs) bear a relatively large burden of the adjustment required to satisfy the savings-investment balance.

Finally, note that the closure rule of the model changes in a counterfactual policy simulation. For instance, in a trade policy simulation, the foreign savings level may be fixed at a level lower than that attained in the historical run, and the UIT-cum-UES rate may be made endogenous. The model will then determine an UIT-cum-UES rate that is consistent with the reduced level of foreign savings.

A comparison between the realised growth rates and levels and those generated by the model is presented in the tables 1 and 2 for the following macroeconomic variables at constant (base-year) prices : (i) Gross Domestic Product at Market Prices (GDPMP), (ii) Private Consumption Expenditure (CNS), (iii) Investment (INV), (iv) Exports (EXP), and (v) Imports. It will be seen that the correspondence of the model-generated growth rates with the actual ones is reasonably satisfactory. Note also that for all the five tracking indicators the year-to-year directional movement in the growth rates is captured quite successfully by the model. In other words, the model captures the rise or decline - as the case maybe - in the growth rates of different years (as compared to that of the respective

previous years). Turning to the levels, it may be noted that the model captures the turning points quite well. In any case, the model cannot be expected to match the "historic" levels, as the tracking procedure was set up to minimise the squared deviations from actual growth rates rather than levels.

Even though the magnitude of every single exogenous variable and parameter plays a role in determining the outcome of the model, it is useful to analyse the growth trends generated by the model in terms of the changes in the values of selected variables and parameters given in table 3. These variables are the following :

- (i) the exogenously specified levels of real investment and real agricultural output;
- (ii) the import price index, IMPPI, derived from the world prices of imports (which are fed exogenously into the model);
- (iii) the export price index, EXPPI, derived from the prices of exportables generated within the model ;
- (iv) the parameter "exscale" which measures the scale of world demand for Indian exports ;
- (v) the terms of trade (TOT) which is simply the ratio of EXPPI and IMPPI;
- (vi) the real exchange rate (RER), which is derived from the commodity market clearing prices of the model solution, as the ratio of the weighted average of prices in sectors 1-4 - i.e., the tradable sectors - to the weighted average of prices in sectors 5-6 - i.e., the non-tradable sectors. (The weights used are the export volumes for the tradable sectors and the final demands for the non-tradable sectors).

Table 1 : Growth Rates of Tracking Indicators

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
OGDPMP	7.56	6.33	1.91	6.77	9.87	5.33	4.57	2.53
DGDPMP	-6.60	6.00	2.77	6.50	9.51	5.97	4.43	1.50
OCNS	3.41	2.93	4.98	4.65	7.98	6.44	6.44	3.34
DCNS	4.09	3.17	4.41	4.85	8.23	6.00	5.00	2.01
OINV	2.95	19.23	-2.85	5.41	16.67	5.91	7.70	-1.33
DINV	3.18	18.59	-2.35	5.24	16.18	6.20	7.85	-1.43
OEXP	8.12	-6.58	5.68	12.94	9.40	23.28	8.17	-0.95
DEXP	7.76	-6.75	5.70	12.54	9.57	23.94	7.80	-1.50
OIMP	-14.33	12.95	18.22	-1.96	9.01	20.56	21.78	-10.19
DIMP	-14.26	13.05	18.31	-1.86	8.87	20.32	22.00	-18.00

Note : The terms implied in the notations used in the above table are as follows :

OGDPMP : Model Generated GDP (at market prices) at base-year prices.

DGDPMP : Data Specified GDP (at market prices) at base-year prices.

OCNS : Model Generated Private Consumption at base-year prices.

DCNS : Data Specified Private Consumption at base-year prices.

OINV : Model Generated Investment at base-year prices.

DINV : Data Specified Investment at base-year prices.

OEXP : Model Generated Exports at base-year prices.

DEXP : Data Specified Exports at base-year prices.

OIMP : Model Generated Imports at base-year prices.

DIMP : Data Specified Imports at base-year prices.

Table 2 : Indices of Levels of the Tracking Indicators

	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	92-92
OGDPMP	1.00	1.08	1.14	1.17	1.24	1.37	1.44	1.51	1.54
DGDPMP	1.00	1.07	1.13	1.16	1.24	1.36	1.44	1.50	1.52
OCNS	1.00	1.03	1.06	1.12	1.17	1.26	1.34	1.43	1.48
DCNS	1.00	1.04	1.07	1.12	1.18	1.27	1.35	1.42	1.44
OINV	1.00	1.03	1.23	1.19	1.26	1.47	1.55	1.67	1.65
DINV	1.00	1.03	1.22	1.19	1.26	1.46	1.55	1.67	1.65
OEXP	1.00	1.08	1.01	1.07	1.21	1.32	1.63	1.76	1.74
DEXP	1.00	1.08	1.00	1.06	1.20	1.31	1.62	1.75	1.72
OIMP	1.00	0.86	0.97	1.14	1.12	1.22	1.47	1.80	1.61
DIMP	1.00	0.86	0.97	1.15	1.13	1.23	1.47	1.80	1.47

Note : The notations used in the above table are the same as in table 1.

Table 3 : Selected Features of the Model Generated Historical Run

	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	92-92
dX(1)/X(1) in %	0.00	0.87	1.61	0.97	0.55	15.00	3.00	3.50	-2.00
Change in.									
INV. (in %)	0.00	2.95	19.23	-2.85	5.41	16.67	5.91	7.70	-1.33
EXPPPI	1.00	0.95	0.99	1.00	1.01	1.10	1.15	0.99	0.89
%age ch.	0.00	-4.82	3.55	1.86	0.67	9.17	4.54	-14.40	-9.52
IMPPPI	1.00	1.10	1.05	0.86	0.90	0.95	1.06	1.14	1.21
%age ch.	0.00	10.25	-4.89	-17.64	4.78	4.64	11.72	7.87	6.24
TOT	1.00	0.86	0.94	1.16	1.12	1.17	1.09	0.87	0.74
%age ch.	0.00	-13.67	8.87	23.67	-3.92	4.33	-6.43	-20.65	-14.83
CSAVF	29.92	18.29	29.62	14.86	11.74	5.92	17.90	120.44	160.91
CSAVF/CGDPMP (in %)	1.70	1.00	1.44	0.68	0.46	0.21	0.55	4.05	5.81
RER	1.16	1.26	1.29	1.32	1.32	1.34	1.11	1.11	1.05
% age chan.	0.00	8.87	2.36	2.08	0.00	1.52	-17.16	0.00	-5.40
exscale	1.00	0.99	0.81	1.14	1.27	1.52	1.83	1.46	1.11

Note : The terms implied in the notations used in the above table are as follows:

X(1) : Gross output in agriculture

EXPPPI : Index of export prices.

IMPPPI : Index of import prices.

TOT : Terms of Trade.

RER : Real Exchange Rate

CSAVF : Foreign Savings or Current Account Deficit (measured in rupees at current prices).

CGDPMP : GDP ( at market prices ) at current prices

exscale : Scale of world demand for Indian exports

From an analysis of the model generated growth trends (see tables 1 and 3), we note that the fluctuations in the GDP growth rates (in the eighties) are governed mainly by the fluctuations in the growth rates of real agricultural output and real investment. For instance, growth rates of GDP dip in 1986-87, 1989-90 and 1991-92; and in each of these three years there is a sharp decline in the growth rates of real investment and agricultural output. Conversely, the jump in the GDP growth rate takes place in the year, 1988-89, in which there is an investment boom as well as a bumper agricultural harvest. For the changes in the current account deficit, however, the changes in the terms of trade is at best a partial explanation. That is to say, we find that there are years in which small improvements in the terms of trade are

associated with very large reductions in the current account deficit. On the other hand, there are years in which improved terms of trade is associated with an increased current account deficit, and vice versa. In these years, the changes in the volume of exports and imports on account of non-price factors - such as "exscale" and exogenous increase in final demand imports in sectors 1,2 and 5 - are far more important.

Finally, it may be noted that the MGHRs are henceforth taken to be a reasonable replication of the broad contours of development during the period under study. In the counterfactual policy simulations that follow in the next section, they (MGHRs) are therefore used as benchmarks from which deviations are calculated to evaluate the



proposed policy options. In the simulation experiments the values of the tracking parameters are kept fixed - only the relevant exogenous variables and policy parameters are changed to define a new policy package.

### III. THE POLICY SIMULATIONS

This study carried out four counterfactual policy simulations, corresponding to the four policy options mentioned above in section 1, and, examined their impact in terms of the deviations, from the historical run, of the values of the following variables: (i) the real exchange rate, (ii) the real GDP at factor cost, (iii) the current account deficit to GDP ratio, (iv) the real macrovariables, (v) the economywide capital stock, (vi) sectoral export demands, (vii) sectorwise total (i.e., domestic plus exports) final demands, (viii) sectoral gross domestic outputs, (ix) sectoral value added, and (x) government savings relative to the nominal GDP.

#### *Basic Trade Policy Simulation*

In this policy simulation the objective is to examine the implications of bringing about a RER depreciation for a reduction in the current account deficit.

In this policy experiment foreign savings level in each of the years from 1984-85 to 1991-92 is fixed at 20 % lower than the foreign savings level in the corresponding year in the historical run, and, the UIT-cum-UES rate, which was fixed at zero in the historical run, is now permitted to vary from zero (see table 4)

The uniform subsidy on exports leads to increases in export demands in the tradable sectors. The final demands in the tradable sectors as a group increase relative to the the final demands in the non-tradable sectors as a group. Domestic outputs in the

tradable sectors vis-a-vis those in the non-tradable sectors also rise.

The allocative efficiency gains or losses - as the case maybe in a particular year - arising on account of the reallocation of labour and intermediate inputs across sectors in this simulation, is measured in terms of the increases or decreases in real GDP at factor cost (GDPFC) relative to the corresponding level in the historical run. GDPFC increases marginally (in the range 0.02 % - 0.07 %) in the years 1984-85 and 1985-86, and significantly (in the range 0.28 % - 0.65 %) in the years 1990-91 and 1991-92. In all other years, GDPFC decreases marginally (in the range 0.05 % - 0.15 % - see table 4).

The ratio of foreign savings in rupees at current prices (CSAVF) to the nominal GDP at market prices (CGDPMP) decreases for each of the eight years, and, the decline in the average CSAVF/CGDPMP ratio for the nine-year period, 1983-84 to 1991-92, is of 0.42 percentage point. The UIT-cum-UES rate varies (across the years) in the range 5% - 31%. The depreciation in RER (i.e., rise in the prices of tradables relative to the prices of non-tradables) is of a very low order for all the years. The maximum depreciation in the RER is of only 0.63 %, and takes place in the year 1991-92 (see table 4).

For the real macrovariables, there is an increase (as compared to the historical run) in the compound annual growth rates (c.a.g.r.), for the nine-year period 1983-84 to 1991-92, of GDPMP and exports respectively by 0.25 and 3.19 percentage points, and a decrease in c.a.g.r of consumption and imports respectively by 0.05 and 0.10 percentage points (see table 5).

Consumer welfare, evaluated as per the

## Simulation 1

Table 4 : Basic trade policy simulation : selected variables

	SAVF : Foreign Savings (levels)							
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	22.73	39.10	19.92	15.77	9.29	27.65	178.54	432.88
Simulation 1	18.18	31.28	15.94	12.62	7.43	22.12	142.83	346.30
<i>CSAVF/CGDPMP : Foreign Savings to GDPMP ratio</i>								
[increase in percentage points from the historical run]								
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
CSAVF/CGDPMP	-0.21	-0.31	-0.15	-0.12	-0.06	-0.16	-1.07	-1.65
average CSAVF/CGDPMP for the nine-year period						-0.42		
<i>UIT (or UES) : Uniform-Import-Tax / Uniform-Export-Subsidy (in percent)</i>								
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simulation 1	20.9	24.9	16.2	10.7	5.95	14.5	30.5	29.7
GDPFC : GDP (at factor cost) at constant (base-year) prices.								
RER : Real Exchange Rate								
TOT : Terms of Trade								
[percentage increase from the historical run]								
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
GDPFC	0.07	0.02	-0.08	-0.07	-0.15	-0.05	0.28	0.65
RER	0.03	0.04	0.13	0.06	0.03	0.04	0.20	0.63
TOT	-4.93	-6.53	-4.56	-3.39	-1.72	-4.16	-10.15	-33.05

Note : CSAVF : Foreign savings (measured in rupees) at current prices.  
CGDPMP : GDP (at market prices) at current prices.

## Simulation 1

Table 5 : Basic trade policy simulation : real macrovariables

	[percentage increase from the historical run]								increase in c.a.g.r. for 83-84-91-92
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	
OGDPMP	0.20	0.15	-0.06	-0.04	-0.18	0.01	0.86	1.88	0.25
OCNS	0.22	0.06	-0.13	-0.29	-0.39	-0.23	-0.42	-0.40	-0.05
OINV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OEXP	9.60	13.34	9.32	6.83	3.29	7.95	21.52	26.47	3.19
OIMP	4.55	4.80	3.40	1.85	0.86	2.43	1.86	-0.73	-0.10

Note : QGDPMP : Model Generated GDP (at market prices) at base-year prices  
OCNS : Model Generated Private Consumption at base-year prices  
OINV : Model Generated Investment at base-year prices.  
OEXP : Model Generated Exports at base-year prices.  
OIMP : Model Generated Imports at base-year prices.  
c.a.g.r. : Compound Annual Growth Rate

"revealed preference - consumption cost comparisons" methodology, declines in this simulation in comparison with the historical run for all the years (see table 6).

In short, we have in this simulation - as compared to the historical run - a reduced foreign savings to GDP ratio without any significant decrease in real GDP for all the years. It follows that a RER depreciation is successful as a "switching policy" that (by raising the prices of tradables relative to non-tradables) diverts domestic resources into and domestic demands away from tradables vis-a-vis non-tradables - which is required to sustain a reduction in the current account deficit without a loss to real GDP.

However, the "switching" effect leads to a loss in welfare of the domestic consumers.

### **Comprehensive Trade Policy Simulation**

In this policy simulation, the objective is to examine the implications of bringing about a RER depreciation for a reduction in the current account deficit, and, simultaneously, reducing the sector specific tariffs on the imported intermediate inputs as well as the sector specific indirect taxes on the domestic intermediate inputs.

In this policy experiment, (i) foreign savings level in each of the years from 1984-85 to 1991-92 is fixed at 20 % lower than the foreign savings level in the corresponding

**Table 6 : Welfare Implications of the Basic Trade Policy Simulation**

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Las. Ind. :								
Hist. Run	1263.871	1377.705	1456.038	1698.733	1783.731	1849.702	1439.605	1548.541
Las. Ind.:								
Sim.1	1263.449	1375.337	1451.828	1692.381	1775.931	1842.736	1433.270	1548.812
Directional Change in Las. Ind. in Sim.1	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.
P's. Ind. :								
Hist. Run	1264.745	1377.540	1456.814	1697.576	1785.853	1849.159	1416.034	1493.740
Pas. Ind.:								
Sim. 1	1264.323	1375.171	1452.599	1691.222	1778.034	1842.187	1409.797	1488.203
Directional Change in Pas. Ind. in Sim.1	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.
Impact on Consumer Welfare in Sim. 1	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.

*Conclusion: Consumer Welfare Decreases for All the Years in Sim. 1*

[Note : Las. Ind. : Laspeyres Index of quantities.

Pas. Ind. : Paasche Index of quantities.

Dec. : Decrease.

Inc. : Increase.]

year in the historical run, (ii) the UIT-cum-UES rate, which was fixed at zero in the historical run, is now permitted to vary and (iii) sector specific indirect tax rates on domestic outputs for intermediate use are reduced by 20%, and, sector specific tariff rates on the imported inputs are reduced by 30 % - these reductions in the rates of indirect taxes and tariffs are effected for each of the years from 1984-85 to 1991-92.

It will be noticed that, while the previous simulation included only the first one of the two policy measures - (a) depreciating the RER and (b) reducing the tariffs on imported inputs and the indirect taxes on domestic inputs - recommended (above in section 5.1) to improve international competitiveness of domestic products, the present simulation includes both the policy measures. This simulation may, therefore, be viewed as a bolder version of the previous simulation.

The UIT-cum-UES rate and the resulting depreciation in the RER for each of the years is higher in this simulation as compared to those in the corresponding year in the previous simulation. The UIT-cum-UES rate varies (across the years) in the range of 25 % - 75 %, and the RER depreciation varies in the range 0.06 % - 0.66 %. The CSAVF/CGDPMP ratio decreases for each of the eight years, and, the decline in the average CSAVF/CGDPMP ratio for the period, 1983-84 to 1991-92, is of 0.47 percentage point (see table 7).

Like in the previous simulation, the uniform subsidy on exports leads to increases in export demands, which in turn brings about a change in the structure of total final demands and domestic outputs in favour of the tradable sectors. The increased export orientation in production leads to allocative efficiency gains - in terms of increases in

GDPFC - for all the eight years, in the range 0.11 % - 0.94 % (see table 7).

The prices of bundles of domestic intermediates are pulled downwards by the (exogenously given) decreases in the sector specific indirect tax rates on domestic intermediate inputs. On the other hand, these prices are pushed upwards by the increases in the constituent domestic prices that come about in this simulation. Since the upward pressure on the prices of bundles of domestic intermediates, on account of the increases in the domestic prices is stronger, the prices of the former increase. In a like manner, the prices of bundles of imported intermediates rise, because the uniform import tax rate determined in this simulation more than compensates the (exogenously given) decreases in the sector specific tariff rates. Moreover, the increases in the prices of bundles of domestic intermediates are of a higher order than the increases in the prices of bundles of imported intermediates. That is to say, the prices of bundles of domestic intermediates relative to the prices of imported intermediates rise. And there is, therefore, a substitution in production in favor of imported intermediates vis-a-vis domestic intermediates.

For the real macrovariables, there is an increase, for all the eight years, in the GDPMP, private consumption, exports, and imports (with the exogenously fixed aggregate investment remaining unchanged). The annual increases in exports are greater than those in the case of imports - and, the c.a.g.r. (for the nine-year period) for exports and imports increase respectively by 6.97 and 1.36 percentage points. The c.a.g.r. for private consumption increases marginally by 0.06 percentage point. For GDPMP the c.a.g.r. increases by 0.46 percentage point (see table 8).

## Simulation 2

Table 7 : Comprehensive trade policy simulation : selected variables

	SAVF : Foreign Savings (levels)							
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	22.73	39.10	19.92	15.77	9.29	27.65	178.54	432.88
Simulation 2	18.18	31.28	15.94	12.62	7.43	22.12	142.83	346.30
tnd (i) : Indirect taxes on domestic intermediate inputs								
tnm (i) : Tariffs on imported inputs								
	84-85 to 91-92				84-85 to 91-92			
	Historical Run	Simulation 2		Historical Run	Simulation 2		Historical Run	Simulation 2
tnd (1)	02.90 %	02.32 %		tnm (1)	038.49 %		026.94 %	
tnd (2)	15.86 %	12.69 %		tnm (2)	145.22 %		101.65 %	
tnd (3)	02.69 %	02.15 %		tnm (3)	078.24 %		054.77 %	
tnd (4)	08.71 %	06.97 %		tnm (4)	124.71 %		087.30 %	
tnd (5)	08.05 %	06.44 %		tnm (5)	008.57 %		006.00 %	
tnd (6)	04.91 %	03.93 %		tnm (6)	000.00 %		000.00 %	

CSAVF/CGDPMP : Foreign Savings to GDPMP ratio  
[ increase in percentage points from the historical run ]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
CSAVF/CGDPMP	-0.26	-0.37	-0.18	-0.14	-0.07	-0.18	-1.18	-1.81
average CSAVF/CGDPMP for the nine-year period	-0.47							

UIT (or UES) : Uniform-Import-Tax / Uniform-Export-Subsidy (in percent)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simulation 2	63.5	57.1	53.4	27.4	41.1	71.6	51.6	46.3

GDPFC : GDP (at factor cost) at constant (base-year) prices

RER : Real Exchange Rate ; TOT : Terms of Trade

[percentage increase from the historical run]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
GDPFC	0.51	0.41	0.30	0.25	0.11	0.20	0.41	0.94
RER	0.06	0.25	0.23	0.15	0.10	0.05	0.27	0.66
TOT	-17.17	-18.95	-18.94	-16.51	-18.19	-20.69	-22.41	-42.35

Note : CSAVF : Foreign savings (measured in rupées) at current prices.  
CGDPMP : GDP (at market prices) at current prices.

## Simulation 2

Table 8 : Comprehensive trade policy simulation : real macrovariables

	<i>[percentage increase from the historical run ]</i>								<i>increase in c.a.g.r. for</i>
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	83-84-91-92
OGDPMP	0.95	0.75	0.08	0.53	0.40	0.46	1.73	3.51	0.46
OCNS	1.93	1.54	1.35	1.03	1.21	1.41	0.44	0.46	0.06
OINV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OEXP	41.20	48.42	49.93	41.07	43.58	50.79	58.12	65.56	6.97
OIMP	24.75	23.00	25.20	19.46	22.45	26.34	14.87	10.71	1.36

*Note* : OGDPMMP : Model Generated GDP ( at market prices) at base-year prices

OCNS : Model Generated Private Consumption at base-year prices

OINV : Model Generated Investment at base-year prices.

OEXP : Model Generated Exports at base-year prices.

OIMP : Model Generated Imports at base-year prices.

c.a.g.r. : Compound Annual Growth Rate

The reductions in the rates of import tariffs and indirect taxes on domestic intermediates, have adverse consequences for the government budget. There is a decline in the total tax revenue relative to nominal GDP, which, in turn, leads to a decrease in the government savings relative to nominal GDP - by 2 to 6 percentage points.

Consumer welfare in this simulation, as compared to that in the historical run, increases for the first two years and declines in the subsequent six years. It follows that, in a welfare comparison, this policy simulation does not dominate the historical run, nor does the latter dominate the former (see table 9).

The results of this simulation show that a policy, which reduces the rates of tariff on imported intermediates and the indirect taxes on intermediate inputs, and, simultaneously, brings about a RER depreciation (through a UIT-cum-UES scheme), is successful in generating allocative efficiency gains for GDPFC along with an improvement in the current account

balance, but, leads to an adverse fiscal balance. The above policy package should, therefore, ideally include an additional component, say, an increase in the direct tax rates and a decrease in the government consumption expenditure to prevent any adverse implication for the budget. The exact degree of adjustment required in the direct tax rates and government expenditure for maintaining given levels of foreign and government savings can be worked out through an independent policy simulation.

#### **Expansionary Public Investment Policy Simulation**

In this policy simulation, the objective is to examine the implications of pursuing an expanded public investment programme financed by an increase in the direct tax rates.

In this policy experiment, (i) real public investment is increased by 10 % for each of the years from 1984-85 to 1991-92, (ii) direct tax rates are increased by 10 %, also for each of the years from 1984-85 to 1991-92, and, (iii) foreign savings (or the current

**Table 9 : Welfare Implications of the Comprehensive Trade Policy Simulation**

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Las. Ind.:								
Hist. Run	1263.871	1377.705	1456.038	1698.733	1783.731	1849.702	1439.605	1548.541
Las. Ind.: Sim. 2	1266.435	1378.505	1454.318	1694.236	1777.050	1845.831	1435.113	1544.513
Directional Change in Las.								
Ind. in Sim. 2	Inc.	Inc.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.
Pas. Ind.:								
Hist. Run	1432.819	1578.763	1592.965	1798.958	1847.406	2014.701	1657.862	1729.755
Pas. Ind. :								
Sim. 2	1435.724	1579.676	1591.078	1794.183	1840.476	2010.476	1652.657	1725.214
Directional Change in Pas. Ind. in Sim. 2	Inc.	Inc.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.
Impact on Consumer Welfare in Sim. 2	Inc.	Inc.	Dec.	Dec.	Dec.	Dec.	Dec.	Dec.

Conclusion : Consumer Welfare Increases for 2 years and Decreases for the remaining 6 years in Sim. 2.

[Note : Las. Ind. : Laspeyres Index of quantities.

Pas. Ind. : Paasche Index of quantities.

Dec. : Decrease.

Inc. : Increase.]

account deficit) level is made endogenous and the UIT-cum-UES rate is fixed at zero - like in the historical run.

The increase in investment, in this simulation, has a demand generating as well as a capacity creating - or supply augmenting - effect. In the growth path generated in this simulation, there are two distinct phases - phase I extends from the year 1984-85 to 1989-90, and, phase II covers the period 1990-91 to 1991-92. In phase I the demand generating effect is dominant, and, the domestic prices relative to the international prices rise, which, in turn, leads to a fall in exports and a rise in imports. In phase II, on the other hand, the supply augmenting effect becomes stronger, and, the relative domestic prices fall, leading, thereby, to a rise in exports and a fall in imports. The foreign savings levels as well as the

CSAVF/CGDPMP ratios, increase in phase I, and, decrease in phase II, but, for the nine-year period as a whole, the average CSAVF/CGDPMP ratio increases by 0.14 percentage point. Moreover, the RER appreciates in the years 1984-85 to 1989-90 having increased foreign savings, and, depreciates in the last two years having decreased foreign savings (see table 10).

In phase I GDPMP increases - despite reduced exports and increased imports - mainly on account of the increase in investment. In phase II, there is, apart from the increase in investment, also an increase in exports and a decrease in imports, and, therefore, larger increases in GDPMP. The sectoral capital stocks and the economywide capital stock, increase progressively all through the eight year period (see table 11).

## Simulation 3

Table 10 : Expansionary public investment simulation : selected variables

PUBINV : Public Investment (hundreds of crore rupees)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	231.2	239.5	260.7	247.7	252.7	316.3	341.0	346.7
Simulation 3	254.3	263.4	286.8	272.5	277.9	347.9	375.1	381.4

tk : Direct taxes on capital income

tw : Direct taxes on wage-income and income of self employed

8485 to 9192

	Historical Run	Simulation 3
tk (for i=2,...,6)	11.85 %	13.03 %
tw (for i=2,...,6)	05.47 %	06.02 %

SAVF : Foreign Savings (levels)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	22.73	39.10	19.92	15.77	9.29	27.65	178.54	432.88
Simulation 3	34.27	49.67	32.02	26.55	24.00	44.83	178.05	379.26

CSAVF/CGDPMP : Foreign Savings to GDPMP ratio  
[ increase in percentage points from the historical run ]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
CSAVF/CGDPMP	0.49	0.37	0.40	0.30	0.33	0.33	-0.11	-0.86
average CSAVF/CGDPMP for the nine-year period						0.14		

GDPFC : GDP (at factor cost) at constant (base-year) prices

RER : Real Exchange Rate ; TOT : Terms of Trade

[ percentage increase from the historical run ]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
GDPFC	0.19	0.22	0.28	0.34	0.26	0.56	1.02	1.44
RER	-0.11	-0.02	-0.09	-0.17	-0.04	-0.30	0.14	1.09
TOT	4.53	3.71	2.83	2.35	2.57	2.01	-0.89	-27.86

Note : CSAVF : Foreign savings (measured in rupees) at current prices.

CGDPMP : GDP (at market prices) at current prices.

GDPFC increases for each of the eight years, and the gains in GDPFC vary across the years in the range of 0.15 % - 1.45 % (see table 10). The 1983-84 to 1991-92 c.a.g.r. for real investment and GDPMP increases respectively by 0.62 and 0.38

percentage points. The c.a.g.r. for exports increases by 1.40 percentage point, and for imports the c.a.g.r. decreases by 0.93 percentage point. For consumption, the c.a.g.r. decreases by 0.09 percentage point (see table 11).



The 10 % increase in the direct tax rates leads to only marginal increases in total tax revenue relative to nominal GDP, and, does not have any significant impact on the government budget.

Consumer welfare in this simulation, in comparison with that in the historical run, increases for each of the eight years (see table 12).

The results of this simulation show that, an expansionary public investment policy brings about not only growth in real GDP and the capital stocks, but, also, after a lag of six years, an improvement in the current account balance. However, in the short term - i.e., in the first six years - the expanded public investment programme, in the absence

of an appropriate trade policy measure, results in deteriorating current account deficits. It follows that, that an expansionary public investment policy, in the context of a transition towards an outward-looking policy regime, should ideally be accompanied by a suitable trade policy - such as a RER depreciation.

#### **Investment-cum-Trade Policy Simulation**

In this simulation, the objective is to examine the implications of pursuing an expanded public investment programme financed by an increase in the direct tax rates, and, simultaneously, bringing about a RER depreciation for a reduction in the current account deficit.

In this policy experiment, for each of the

#### **Simulation 3**

**Table 11 : Expansionary public investment simulation : real macrovariables**

	<i>[percentage increase from the historical run]</i>								<i>increase in c.a.g.r. for</i>
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	83-84-91-92
OGDPMP	0.39	0.43	0.44	0.45	0.22	0.54	1.36	2.89	0.38
OCNS	0.45	0.27	0.24	0.10	-0.13	0.07	-0.32	-0.65	-0.09
OINV	5.22	4.55	5.08	4.58	4.00	4.73	4.73	4.73	0.62
OEXP	-7.43	-6.30	-5.97	-5.01	-5.28	-4.18	1.52	10.91	1.40
OIMP	7.00	5.78	5.53	4.25	4.05	3.86	-0.65	-6.78	-0.93
K(1)	0.00	0.05	0.12	0.16	0.31	0.41	0.52	0.66	
K(2)	0.00	0.56	0.84	1.09	1.56	1.66	1.73	1.87	
K(3)	0.00	1.01	2.11	3.97	4.86	5.73	6.66	7.32	
K(4)	0.00	0.94	1.56	2.92	3.09	3.89	4.13	4.61	
K(5)	0.00	1.30	2.82	3.91	5.09	5.78	6.51	7.25	
K(6)	0.00	0.27	0.43	0.65	0.72	0.82	0.95	1.08	
EWKS	0.00	0.38	0.57	1.05	1.24	1.54	1.88	2.19	

Note : OGDPM P : Model Generated GDP ( at market prices) at base-year prices

OCNS : Model Generated Private Consumption at base-year prices

OINV : Model Generated Investment at base-year prices.

OEXP : Model Generated Exports at base-year prices.

OIMP : Model Generated Imports at base-year prices.

c.a.g.r. : Compound Annual Growth Rate

EWKS : Economy wide capital stock.

K(i) : Capital stock in sector i.

years from 1984-85 to 1991-92, (i) real public investment is increased by 10 % (ii) direct tax rates are increased by 10 % , (iii) foreign savings are fixed at levels which are 20 % lower than that in the corresponding year of the historical run, and (iv) the UIT-cum-UES rate is now made a free variable.

This simulation combines the effects of simulations 1 and 3. The UES on exports leads to increases in export demands in the tradable sectors. The increase in aggregate public investment, on the one hand, leads to increases in capital stocks for all sectors, and, on the other hand, leads to increases in investment demands for all the sectors. (Note that there are fixed allocation ratios of aggregate investment which determine investment demands by sectors of origin, and fixed shares for sectors of destination as well). The gains in GDPFC in this simulation are a result of the extra capacities created due to increases in the capital stocks, and the simultaneous increases in

the investment and export demands. The RER depreciates and the foreign savings to GDP ratio (CSAVF/CGDPMP) declines for all the eight years in this simulation. GDPFC gains occur in each of the eight years, and vary across the years in the range 0.35 % - 1.55 %. The nine-year average CSAVF/CGDPMP ratio declines by 0.44 percentage point, and the RER depreciation varies across the years in the range 0.05 % - 1.35 % . (The UIT-cum-UES rate varies across the years in the range 22 % - 96% - see table 13).

For the real macrovariables, there is an increase, for all the eight years, in the GDPMP, investment, exports, and imports, with the annual increases in the GDPMP being consistently higher than those in the previous simulation. The c.a.g.r. for GDPMP increases by 0.46 percentage point ; for investment and exports, the c.a.g.r.s increase respectively by 0.62 and 3.23 percentage points. For private consumption

**Table 12 : Welfare Implications of the Expansionary Public Investment Policy Simulation**

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Las. Ind.:								
Hist. Run	1263.871	1377.705	1456.038	1698.733	1783.731	1849.702	1439.605	1548.541
Las. Ind.: Sim.3	1287.284	1397.976	1475.216	1716.319	1805.236	1879.528	1451.397	1564.345
Directional Change in Las. Ind. in Sim.3	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
Pas. Ind.:								
Hist. Run	1760.326	1787.301	1837.756	1833.641	2117.999	2629.902	1746.619	1760.299
Pas. Ind.: Sim.3	1792.778	1813.471	1861.832	1852.379	2143.391	2671.996	1760.541	1777.746
Directional Change in Pas. Ind. in Sim.3	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
Impact on Consumer Welfare in Sim.3	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.

Conclusion: Consumer Welfare Increases for All the Years in Sim. 3

[Note : Las. Ind. : Laspeyres Index of quantities.

Pas. Ind. : Paasche Index of quantities.

Dec. : Decrease; Inc. : Increase.]

## Simulation 4

Table 13 : Investment-cum-trade policy simulation : selected variables

PUBINV : Public Investment (hundreds of crore rupees)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	231.2	239.5	260.7	247.7	252.7	316.3	341.0	346.7
Simulation 4	254.3	263.4	286.8	272.5	277.9	347.9	375.1	381.4

SAVF : Foreign Savings (levels)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	22.73	39.10	19.92	15.77	9.29	27.65	178.54	432.88
Simulation 4	18.18	31.28	15.94	12.62	7.43	22.12	142.83	346.30

tk : Direct taxes on capital income

tw : Direct taxes on wage-income and income of self employed

84-85 to 91-92

	Historical Run	Simulation 4
tk (for i=2,...,6)	11.85 %	13.03 %
tw (for i=2,...,6)	05.47 %	06.02 %

CSAVF/CGDPMP : Foreign Savings to GDPMP ratio

[ increase in percentage points from the historical run ]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
CSAVF/CGDPMP	-0.23	-0.34	-0.17	-0.13	-0.07	-0.18	-1.13	-1.71
average CSAVF/CGDPMP for the nine-year period						-0.44		

UIT (or UES) : Uniform-Import-Tax / Uniform-Export-Subsidy (in percent)

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Historical Run	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simulation 4	80.1	66.4	89.1	76.3	89.0	95.5	41.5	23.0

GDFC : GDP (at factor cost) at constant (base-year) prices

RER : Real Exchange Rate ; TOT : Terms of trade

[ percentage increase from the historical run ]

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
GDPFC	0.44	0.39	0.53	0.53	0.61	0.69	1.08	1.51
RER	0.06	0.06	0.08	0.08	0.04	0.12	0.25	1.32
TOT	-10.08	-10.49	-14.35	-14.14	-15.47	-15.70	-11.81	-33.08

Note: CSAVF : Foreign savings (measured in rupees) at current prices.

CGDPMP : GDP (at market prices) at current prices.

and imports, the c.a.g.r. decline respectively 0.08 and 0.49 percentage point (see table 14).

The sectoral capital stocks and the economywide capital stock increase progressively all through the eight years (see table 14).

Consumer welfare in this simulation, as compared to that in the historical run, increases for five of the eight years and decreases in the remaining three years (see table 15). It follows that, in a welfare comparison, this policy simulation does not dominate the historical run, nor does the latter dominate the former.

The results of this simulation show that a real exchange rate depreciation - brought

about in this simulation through an UIT-cum-UES scheme - complements an expanded public investment programme, in so far as, growth in real GDP is enhanced and also accompanied by a reduced foreign savings to GDP ratio.

#### IV. POLICY CONCLUSIONS

The above policy simulations are more useful in identifying the directional changes that result from pursuing certain policy options than in describing exactly how the policy package for executing the transition to an outward-looking strategy should be designed. Given this caveat, we may note the following three broad policy conclusions which emerge from our counterfactual policy simulations. First, the basic policy measure required to facilitate the transition to an

#### Simulation 4

Table 14 : Investment-cum-trade policy simulation : real macrovariables

	<i>[percentage increase from the historical run]</i>								<i>increase in c.a.g.r. for 83-84-91-92</i>
	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	
OGDPMP	0.98	0.89	0.68	1.03	0.94	0.94	1.95	3.58	0.46
OCNS	1.21	0.82	1.03	0.75	0.85	0.73	-0.29	-0.65	-0.08
OINV	5.22	4.55	5.08	4.58	4.00	4.73	4.73	4.73	0.62
OEXP	21.55	23.12	33.18	32.23	34.27	34.34	25.02	26.80	3.23
OIMP	21.38	17.61	22.63	19.53	21.04	21.60	5.44	-3.65	-0.49
K(1)	0.00	0.04	0.11	0.15	0.29	0.39	0.49	0.61	
K(2)	0.00	0.52	0.83	1.09	1.51	1.58	1.63	1.79	
K(3)	0.00	1.01	2.08	3.87	4.82	5.67	6.48	7.22	
K(4)	0.00	0.91	1.53	2.82	3.02	3.85	4.02	4.42	
K(5)	0.00	1.27	2.81	3.79	5.04	5.63	6.11	7.23	
K(6)	0.00	0.28	0.42	0.65	0.69	0.72	0.91	0.97	

- Note : OGDPM P : Model Generated GDP ( at market prices) at base-year prices  
 OCNS : Model Generated Private Consumption at base-year prices  
 OINV : Model Generated Investment at base-year prices.  
 OEXP : Model Generated Exports at base-year prices.  
 OIMP : Model Generated Imports at base-year prices.  
 c.a.g.r. : Compound Annual Growth Rate  
 EWKS : Economy wide capital stock.  
 K(i) : Capital stock in sector i.

**Table 15 : Welfare Implications of the Investment-cum-Trade Policy Simulation**

	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Las. Ind.:								
Hist. Run	1263.871	1377.705	1456.038	1698.733	1783.731	1849.702	1439.605	1548.541
Las. Ind.: Sim. 4	1269.484	1381.486	1459.092	1700.713	1781.787	1851.211	1435.226	1538.564
Directional Change in Las.								
Ind. in Sim. 4	Inc.	Inc.	Inc.	Inc.	Dec.	Inc.	Dec.	Dec.
Pas. Ind.:								
Hist. Run	1326.557	1432.112	1508.543	1745.962	1833.050	1894.783	1425.506	1449.242
Pas. Ind.: Sim. 4	1332.448	1436.035	1511.685	1747.949	1830.961	1896.260	1421.125	1439.853
Directional Change in Pas.								
Ind. in Sim. 4	Inc.	Inc.	Inc.	Inc.	Dec.	Inc.	Dec.	Dec.
Impact on Consumer Welfare in Sim. 4								
	Inc.	Inc.	Inc.	Inc.	Dec.	Inc.	Dec.	Dec.
Conclusion: Consumer Welfare Increases for 5 years and Decreases for the remaining 3 years in Sim. 4.								

[Note : Las. Ind. : Laspeyres Index of quantities.

Pas. Ind. : Paasche Index of quantities ; Dec.: Decrease ; Inc. : Increase.

outward-looking strategy is a real exchange rate depreciation, which helps to improve the current account balance - i.e., to reduce the foreign savings to GDP ratio - without any (significant) loss to real GDP. Second, in addition to the RER depreciation, if there are reductions in the rates of sector specific indirect taxes on domestically produced inputs and in the rates of sector specific import tariffs, there would come about not only further improvement in the current account balance, but some gains for real GDP as well. However, there would result a deterioration in the internal fiscal balance for which some adjustment in the direct tax rates and the government expenditure would have to be brought about. Third, to stimulate growth in real GDP and the capital stock, the policy of increasing public investment carries a disadvantage in so far as it leads to a deterioration in the current account balance. The policy of increased public investment, therefore, must be accompanied by a policy of RER depreciation - the two policies will

complement each other to generate larger gains in real GDP (as compared to those in case of increased public investment not accompanied by RER depreciation) as well as improvement in the current account balance.

In other words the analysis of this study, which is mainly based on the policy simulations of section III, points towards the following conclusion : the transition towards an outward-looking policy regime in India could have been initiated in the early eighties itself (and not delayed as far as the post Gulf-War year 1991-92), by bringing about a real exchange rate depreciation and a reduction in the rates of the import tariffs and the indirect taxes on the domestic inputs. These policies would have resulted in allocative efficiency gains for real GDP as well as an improvement (i.e., a reduction) in the foreign savings to GDP ratio, but at the cost of a deterioration in the internal fiscal balance. To minimise this cost, adjustment

in the direct tax rates and the government expenditure (for which no simulation has been worked out in this study) would have been required. Furthermore, an expansionary public investment policy could have been employed to enhance growth in real GDP and the capital stock, provided it was combined with a policy of real exchange rate depreciation.

## V. CONCLUDING REMARKS

In conclusion, there are four points which require explicit mention. First, while our CGE model is well suited for analysing questions related to macroeconomic balance and allocative efficiency, it is not so for analysing questions related to the distributional impact of alternative policies as it does not include a mechanism for the determination of the distribution of income. The process of income generation and its distribution among various consumer expenditure classes must be included in a CGE model, if the latter is to be used to assess the gains or losses in the welfare of the different expenditure classes resulting from the alternative policies. For example, the process of income generation and of its distribution among ten consumer expenditure classes forms a part of the CGE model for the Indian economy given by Narayana, Parikh & Srinivasan (1991). The size of the population in each class, its average income and consumption expenditure are determined within the model, and the expenditure class limits are kept constant in the model scenarios in terms of equivalent income. The welfare impact of the alternative policies is then examined by comparing the distribution of population among the expenditure classes and the per capita equivalent income in each class in a policy scenario with those of the reference scenario. In the absence of such an income distribution mechanism from our CGE model, we could

not examine the distributional impact of the proposed outward-oriented policies, and, therefore, merely looked at the impact of these policies on aggregate consumer welfare.

Second, in keeping with its medium-term focus on the impact of trade and investment policies on growth, internal fiscal balance, and, balance of payments, our exercise has concentrated on the "real" side of the economy. The exclusion of monetary considerations, however, has implied that the consequences of a deflationary monetary policy on the RER, allocation of resources across tradables and non-tradables, and, thereby, on growth, and balance of payments could not be taken up in our study<sup>3</sup>.

Third, there are - apart from the four policy options examined in this study - certain other policy options which the model, as it currently stands, is capable of exploring but where no experiments have been done, for want of time. For example, an additional policy option (in the context of a transition to an outward-looking strategy) could be defined - in terms of a combination of the policy options in simulation 2 and 4 - to include the following measures: a RER depreciation (through an UIT-cum-UES scheme) for a reduced level of current account deficit, an expanded public investment programme, a reduction in the rates of sector specific tariffs on imported intermediates as well as in the rates of indirect taxes on domestic intermediates, an increase in the direct tax rates and a decrease in the government consumption expenditure. A simulation, based on the above policy package, could provide an answer to the interesting policy question: by how much would direct taxes have to be increased and the government consumption decreased in order to compensate for the revenue loss on account of the reduction in

the sector specific import tariffs and indirect taxes on the domestic intermediate inputs<sup>4</sup>.

Finally, the RER depreciation is brought about in simulations 1,2 and 4 by a uniform-import-tax-cum-export-subsidy, keeping the exchange rate fixed. (This is because, between the uniform<sup>2</sup>import-tax-cum-export-subsidy policy - or some variant of that - and, the nominal exchange rate devaluation, the former is most likely to be the preferred option, in the specific context of a transition to an outward-looking strategy). However, the results of these simulations are general enough to apply in the case of a RER depreciation brought about by a nominal exchange rate devaluation.

## FOOTNOTES

1 It may be noted here that the public sector share of total investment in the Indian economy rose from less than one-third in the early fifties to about one-half during the eighties, and that the growing fiscal deficit is not an evidence of the unsustainability of the large share of public sector investment in the total investment. In this regard, the following observation made by Mundle & Rao (1992, pg. 233) is pertinent : As revealed by the economic classification of expenditure in less than twenty years, from 1971-72 to 1987-88, the share of capital (investment) expenditure has shrunk from over 56% of total central government expenditure to only 30%, crowded out by the dramatic increases in the share of interest payments, subsidies and compensation to government employees. .... Clearly, while an attempt is made to contain the growth of total expenditure, the shares of redistributive package and the capital (investment) expenditure on essential infrastructure must be raised. the obvious candidates for overall expenditure compression are therefore the three main items of revenue expenditure. i.e., interest payments which account for about 70% of

total government expenditure , i.e., interest payments, subsidies and compensation to government employees."

- 2 Note that if the adjustment needed to prevent the deterioration in the internal fiscal balance is restricted to only an increase in the direct tax rates, very steep hikes in the tax rates may be required.
- 3 For a theoretical analysis of the consequences of a deflationary monetary policy on the RER , and the allocation of resources across tradables and non-tradables, see Edwards (1988).
- 4 In a simulation designed to specifically answer this question, the government savings to nominal GDP ratio will be fixed at the historical run level (or any other desirable level), and the model will solve endogenously for a single parameter which represents the proportionate degree of adjustment applied to both government consumption and tax rates.

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