7.0. SUMMARY:

This study focused its attention on the long-standing problems of India's trade deficit, declining foreign exchange reserves and spiralling domestic prices. It tried to identify the determinants of trade balance and inflation within the framework of a Computable General Equilibrium (CGE) model. It examined the policy impact of exchange rate changes (devaluation) and other trade-related policy instruments on important macro-economic aggregates of the economy. The need for integration of monetary and trade sectors in analysing the trade balance and balance of payments scenarios has been emphasised. The model took into account some of the institutional features of the Indian economy such as foreign exchange rationing, export subsidies, import restrictions, etc.

Chapter 2 provided a brief review of International monetary systems, its evolution and growth. This enabled us to know how the external payments were adjusted historically and also the evolution of devaluation as a policy instrument to reduce the imbalance in the external sector of an economy. Among the three theoretical approaches to devaluation viz., the Elasticity, Absorption and Monetary Approaches, the Monetary Approach was considered more suitable to countries like India. Using this approach, the relationship between devaluation and trade balance...
and inflation were examined.

A review of some relevant works was made in Chapter 3. The studies relating to devaluation were grouped into three categories viz., (i) studies relating to devaluation and trade balance, (ii) devaluation and inflation and (iii) devaluation studies in Indian context. This review of literature has lead us to identify the CGE model of Sunderarajan (1986) as the appropriate tool for our purpose.

The CGE methodology and the present model are given in Chapter 4. A computable general equilibrium trade model was specified. The postulated model comprises of eight equations of which four are identities. These include three trade equations, the money demand function and four definitional identities. These together make-up the complete model, representing the markets for three goods namely, exportables, importables and non-traded goods as well as one asset viz., money. This model provides a synthesis of both elasticities and monetary approaches to devaluation. The role of monetary factors (money demand and supply) on trade variables was examined by integrating monetary and trade sectors.

The model is suitable to analyse the effects of devaluation on macro variables like trade balance, domestic prices, money supply, imports and exports in the Indian economy. The model has incorporated an unobservable new variable called the monetary disequilibrium variable which is derived from the estimated money
demand function and is used in the export supplies and import demand equations to capture the effect of monetary changes on trade variables. Two variants of the model viz., with and without monetary disequilibrium variable are considered.

The model estimation results are discussed in chapter 5. A preliminary trend analysis was made using growth rates, mean and standard deviations. The analysis is supported by graphs for all the important variables used in the study. The CGE model is estimated using annual time series data by OLS and 2SLS methods and in both linear and log-linear functional forms. The model is estimated for three sample periods viz., 1961-87, 1961-89 and 1971-91. The OLS results looked better than 2SLS in terms of significant coefficients for crucial price variables. The estimated coefficients have appropriate signs, statistically significant and plausible magnitudes for most of the relevant variables like relative prices, domestic and trading partners' incomes, current foreign exchange receipts and more importantly the newly introduced flow excess demand for money variable in respective equations. The statistical goodness of fit is also satisfactory.

Chapter 6 dealt with the policy analysis. Historical or Base simulations were done to check the ex-post descriptive power of the model as a simultaneous system of equations. The ex-post and post-sample predictions were found to be satisfactory, with some
exceptions. Using base simulation as a reference scenario, policy simulations were undertaken and their impact, dynamic and equilibrium multipliers are computed. Before undertaking policy change scenarios, sensitivity tests were performed to analyse (a) the dynamic stability of the model and the sensitivity of the impacts to choice of (b) timing of the exogenous change, (c) level of exogenous change, (d) functional form and the parameters used and (e) the method of estimation used to quantify the regression coefficients. The example of devaluation was used to analyse each of these in some detail. The estimated model was found to be dynamically stable, but sensitive to level and timing of exogenous change. It is also sensitive to choice of functional form, sample period and method of estimation.

7.1. CONCLUSIONS:

Some of the broad conclusions of this study which emerge from the analysis of trade balance and inflation in India are as follows:

i) A trend analysis of the data showed that the rate of increase in prices is much faster than the rise in real national income, at the compound rates of 8.1% and 3.8% per annum respectively. The growth in money supply was faster from 1970s onwards at the rate of 13% in 70s, 15.1% in 80s and the overall growth rate being 12.5% for the entire period.
11) There has been acceleration (deceleration) in the import volume (export volume) into India during 1970-90. Imports into India have increased at 5.6% in 70s and 7.1% during 80s, while exports volume has increased at 7.6% and 6% during the respective decades. The overall growth rates in export and import volumes were equal at 5.2%, for the entire period, but imports always exceeded exports with widening trade gap thereby causing chronic imbalances in the trade sector. There needs to be a reversal in the growth rate of exports so that external payments situation could be brought under control.

iii) The world prices exhibited violent fluctuations during the sample period. They increased at 3.7% during 60s, 12% during 70s and 9.9% during 80s. This could have a destabilising effect on national economies and their trade sectors.

iv) Export and import price movements were not favourable to help improve India's trade balance and balance of payments. Though there was a deceleration in import prices during 80s, the growth rates of export and import prices for the entire period were almost equal at 8.4% and 8.3%. Therefore, the terms-of-trade was not favourable for improving India's trade balance.

v) Among the determinants of trade balance, the relative prices have a significant effect on exports and imports as indicated by statistically significant coefficients in the respective
vi) The coefficients for the lagged dependent variable in export and import functions were significant and satisfied stability condition. This implies that the adjustment process between actual and desired volumes involves lags and needs to be considered.

vii) The linkage between trade and monetary sector, through the incorporation of monetary disequilibrium variable, was found to be crucial in analysing the impacts of policy instruments like devaluation and credit control. This was revealed by the significant negative coefficient in import function.

viii) Summary measures like KAPE, RMPE AND THIF were used to validate the model. Based on these measures, there does not seem to be any uniform pattern between ex-post and post-sample simulations in terms of relative superiority. One may expect ex-post simulation to be better than post-sample (inclusive of sample period here) simulation, but this does not seem to hold good. However, the net foreign assets variable seem to support the expected behaviour.

ix) Since the model is simultaneous and dynamic, we could estimate impact, dynamic and equilibrium multipliers using shock type of exogenous change.
x) Sensitivity analysis has shown that the model is dynamically stable but the impacts are somewhat sensitive to level and timing of exogenous change, choice of functional form and method of estimation.

xi) Comparison between linear/log-linear functional forms and OLS/2SLS methods of estimation has shown that the OLS log-linear model has an edge over others due to better stability property. Moreover, log-linear model has its advantage in interpreting the coefficients as elasticities. Therefore, OLS log-linear model estimated for 1962-87 period was used for further policy analysis.

xii) A broad within comparison of static and dynamic simulations shows that there is not much accumulation of (relative) errors over time. As expected, dynamic simulations indicate larger error build-up compared to their static counter-parts.

xiii) Within each simulation, the degree of success varied across variables. Money supply variable and to some extent, unit export value, stand-out well traced uniformly in all simulations. The magnitudes of both MAPE and RMPE values for all other variables, possibly with the exception of net foreign assets variable (R), seem reasonable. The RMPE is always exceeding MAPE which indicates volatile nature of the trade variables. The relative
errors seem large for all variables during 1982-87, second half of the sample period as well as post-sample period (1988-90). This was the post-second oil crisis period during which the net trade balance deteriorated very rapidly, signalling a BOP crisis. It would be difficult to model such volatile behaviour of any phenomenon. Despite this limitation, the model was used for policy analysis.

xiv) Some hypothetical policy simulations were carried out with the estimated model. Important policy variables present in the model are exchange rate (E), unit export subsidy (s), unit import tariff (t), and net domestic credit (D). To measure the effect of any policy simulation, the base simulation values of the endogenous variables are taken as reference levels. In this way, the effect of the policy alone can be isolated from the inaccuracies of model estimation. Otherwise, if the policy simulation is compared with the actual series, any imperfections in the model estimation get included in the policy effect and the resultant change cannot be attributed to policy alone. The period 1978-90 is used for policy simulations.

xv) We examined the likely impacts of some structural adjustment measures on the Indian economy. These include devaluation, reduction in unit export subsidy, increase in import tariff, export: demand elasticity and credit control.
xvi) The results of these policy simulations are broadly in agreement with a priori thinking. In each policy simulation, due to feed-back effects from other variables in a simultaneous equations framework, the net impacts are different from pure partial effects implied by regression coefficients. The impacts vary across time due to lagged behaviour.

xvii) A 30% devaluation is likely to improve India's trade balance by Rs 9.14 crores within the first year. Money supply will increase by Rs 15.3 crores, pushing-up overall price index by 0.5%. There will be a larger fall in imports volume than the rise in exports volume. The unit value of exports will fall by 6.8% making India's exports cheaper. In subsequent years in short-run, due to weaker relative price effect and strong liquidity effect, the overall trade balance will deteriorate. Exports may decline and imports will rise rather marginally. Money supply and price also may indicate a rising trend.

xviii) The direction of medium and long-term effects are as per expectation although somewhat large in magnitudes. Money supply and prices will rise by about 2.2% each. Trade balance and BOP continue to show an improvement. These effects together with the short-run effects describe the well known J-curve for trade balance variable in a slightly modified way. The full long-run equilibrium seems to extend much beyond the thirteen year sample period for verifying the long-run neutrality of devaluation. The
delay and ambiguity of some of these effects is perhaps due to the wrong sign of monetary disequilibrium variable in unit value of exports function. This needs some further probing. Devaluation thus is inflationary, both in short as well as long-runs.

xix) Other comparable scenarios of reduction in credit, unit export subsidy and export demand elasticity have similar but much smaller impacts. However, a policy like 10% reduction in unit import tariffs would spell substantial decline in trade balance and balance of payments which may throw the external sector off the rails, plunging the precarious BOP situation (as in 1991) into unretrivable depths.

xx) Thus to sum-up, among the policy simulations, devaluation and reduction in export subsidies, the latter to a lesser extent, imply both short- and long-run benefits; credit control has only immediate gain and reduction in import tariffs would result in net losses in terms of changes in trade balance, balance of payments and inflation in the Indian economy. Clearly, if two or more policy measures are used together, negative benefits from one policy may offset positive gains from another, resulting in no net benefit to the economy. Thus, the policy maker has to make a judicious choice of these policies keeping the objective in mind. Indiscriminate use of the measures package can jeopardise the very purpose.
7.2. LIMITATIONS:

(a) The major limitation of this study is its aggregative nature. The external sector has been aggregated into four commodity groups. This surely conceals more than it reveals. Data are available for few disaggregated groups of imports and exports. Perhaps, two submodules— one for imports and another for exports, can be built and integrated with the above aggregate model.

(b) The annual time series data used here is another limitation. It would be better if at least quarterly data is made available on all trade related variables so that seasonality could be modelled and the adjustment process in TB and BOP can be better explained.

(c) The present study also could not attend to problems relating to time series models viz., testing for stationarity of variables, correcting for serial correlation and using more reliable estimation methods of simultaneous equation systems.

(d) Lastly, it would have been better if more recent data, particularly after 1991 devaluation, are made available for better quantification of impacts. Also, the data on tariffs and subsidies are not up to date. This also might have affected the quality of results. It must be admitted that the dynamics of international trade, external sector and balance of payments of countries like India are too complex to be captured in a set of few equations. At the most, we might have been able to touch upon only the periphery of the issues involved.