

# Distributional Assumptions and Their Implications for Plan Projections

M. H. Suryanarayana

This paper shows that assumptions about distributional parameters in plan models have implications for projections about commoditywise demand and redistributive changes required to achieve certain targeted poverty reduction. As an example, the paper attempts to quantify such implications with reference to the Fifth Five Year Plan. It is shown that such assumptions lead to distortions in plan projections which are particularly serious for redistributive targets.

## 1. Introduction

It is well-known that any estimate of the demand structure in terms of both commodity composition and their magnitude depends not only upon the mean level of consumption but also on the particular pattern of distribution in that year (Iyengar, 1960a, Jain, 1975, 1978). But, sometimes, in plan modeling, assumptions are made about distribution parameters regardless of their importance in such exercises. If so, the commoditywise demand projections made for the plan period would turn out to be overestimates or underestimates depending upon the sign and magnitude of the divergence of the assumed distribution from the actual one for the base year. This is what we propose to examine in this paper with particular reference to the Fifth Plan for which most of the relevant data are readily available. But it is to be noted that the purpose of paper is essentially methodological in that it attempts to quantify the implications of assumptions about distribution parameters. In this sense, the issue that is examined in this paper will hold relevance for any plan exercise.

In an earlier paper (Suryanarayana, 1983), we pointed out that the Sixth Plan targets for poverty reduction and consumption redistribution were quite ambitious and were "unlikely to be realised". It was also pointed out that some of the plan model assumptions particularly about distribution parameters were likely to distort the entire plan exercise.

For instance, the base year distribution (1973-74) for the Fifth Five Year Plan model was derived from the consumption distributions of 1968-69 (Perspective Planning Division, 1973, p.2). But the observed distribution for the year 1973-74 was very much different from the ones that prevailed in the year 1968-69 in both the rural and urban sectors. On fitting a two-parameter lognormal distribution, we have found the inequality parameter to be 0.560 in 1968-69 and 0.503 in 1973-74 for rural India and 0.642 and 0.504 respectively for the urban areas. The Sixth Plan has also assumed that the inequality parameters in the base year (1979-80) are the same as that observed in 1977-78 (Perspective Planning Division, 1981, p.77). Such assumptions will have definite quantitative implications for plan exercises like required increase in demand for different commodities and required degree of income redistribution.