Name of the Scholar: Subansh Prasad Singh

Name of Supervisor: Prof. M.S.Bhatt

Department: Economics

Faculty: Social Sciences

Title of the Thesis: Cost, Productivity & Pricing of Indian Railways –An Inter-Temporal Analysis (1950-51to 2003-04)

ABSTRACT

It is surprising that despite the tremendous importance of Railways to the Indian economy very few studies have dealt with the productivity directly. These may be thematically divided into two categories. In the first category we have studies that have used the productivity index approach. The second set of studies is based on an analysis of production and/or cost functions.

Most of the work on productivity change studies of Indian railways has been done at aggregate level of Indian railways as a whole and very few attempts have been made to look at the disaggregate level of constituent zones of Indian Railways. This has been attributed to the difficulties pertaining to the data. Sharma (1995) estimated total factor productivity of Indian Railways at disaggregated level of constituent zones using a cost function approach. Some of the major research themes which the above mentioned studies have attempted to explore are: (i) Nature of Production function of Indian Railways; (ii) Estimation of Total Factor Productivity of Indian Railways; (iii) Estimation of Cost Functions at aggregate level. However, there is need to study the productivity trends on Indian railways at disaggregate level (*i.e.*, zone-wise) and to decompose productivity trends into various sources. There is also need to explain the pricing issues specific to Indian Railways.

In view of the importance of Indian railways, identified research questions and existing research gaps the specific objectives of the present study are as under:

To study the productivity trends of Indian Railways at the disaggregate level of its constituent zones using Panel Data Stochastic Frontier Production Functions.

To decompose the productivity changes into its various sources and to study the cost and pricing aspects of Indian Railways.

Following from the data analysis some major results are:

i) The operations of Indian Railways are characterized by increasing returns to scale. This holds true irrespective of whether passenger-kilometres or tonne-kilometres is considered taken as the output variable; ii) The production function estimates point to the presence of non-homothetic production relations in the production of both passenger-kilometres as well as tonne-kilometres. However, the estimated production functions for both the output variables turned out to be well behaved; iii) Ranking of the zonal railways by technical efficiency varied considerably with the estimation procedure used; iv) The average efficiency of Indian Railways has gone up marginally with reference to both output variables. v) The estimated results of all the three inputs like capital, labour and energy were as per expectations in the estimated models. The estimated coefficients were 0.24, 0.59 and 0.66 respectively for the whole sample period. Among these three inputs, the coefficient of energy input (0.66) turned out to be highly significant for the whole period. The estimated results revealed that with one unit change in capital input, the total output in passenger per-kilometer will increase by 0.24 units. The Coefficient of labour (0.59) is also significant at 1 percent level which, indicates that one unit change in labour will lead to in the increase in total output in passenger per kilometer by 0.59 units. One unit of increase in energy leads to the increase of 0.66 units in total output in passenger per kilometer; vi) The estimated results exhibited non-constant returns to scale for both passenger-kilometres and tonne-kilometres as the output variable; vii) The technical efficiency has contributed significantly to productivity changes for both passenger-kilometres as well as tonne-kilometres.