

STUDY OF TOTAL FACTOR PRODUCTIVITY IN INDIAN FERTILISER INDUSTRY

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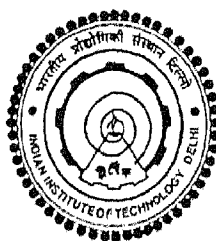
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Submitted

In fulfillment of the requirements of the degree of Doctor of Philosophy

to the



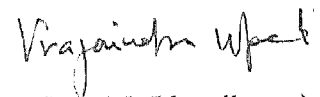
INDIAN INSTITUTE OF TECHNOLOGY, DELHI

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CERTIFICATE

Certified that Ms. Seema Sharma was permitted to work for her Ph.D. Degree in Economics at IIT, Delhi on the problem entitled 'Study of Total Factor Productivity in Indian Fertiliser Industry'. She has faithfully carried out her study under my guidance and supervision and the accompanying thesis is her genuine and original work. The results contained in this thesis have not been submitted in part or full to any other university or Institute for the award of any degree/diploma.

Ms. Seema Sharma has completed necessary coursework and put in the required attendance in this Department.



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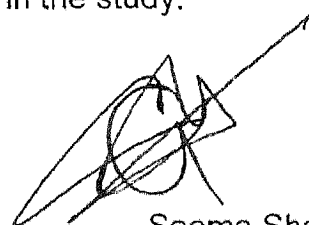
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I am solely responsible for remaining errors, if any, in the study.

A handwritten signature in black ink, consisting of a stylized 'S' and 'S' intertwined, with a long diagonal stroke extending upwards and to the right.

Seema Sharma

Abstract

This present work is mainly concerned with the estimation of Total Factor Productivity (TFP) in Indian fertiliser industry. Fertiliser industry has played a tremendous role in increasing the productivity of Indian Agriculture. Moreover in order to feed the ever-growing population, India needs to increase the fertiliser production. At this backdrop, the analysis of productivity related aspects in Indian fertiliser industry become highly significant. The current work endeavours to obtain the estimates of different components as well as the aggregate estimate of TFP for the period 1973-74 to 1997-98. The estimation procedure includes econometric and the growth accounting approaches. The various components of the productivity growth viz., returns to scale, technical progress, elasticity of substitution and technical bias in Indian fertiliser industry are derived from the parameters of the translog cost function. In order to compute the aggregate estimates of TFP, the Divisia-Tornquist approximation under the implicit assumption of translog form of the production technology has been considered.

Our analysis reveals that Indian fertiliser industry has experienced decreasing returns to scale over the study period. Scale bias has been in favour of material input. Results related to technical progress reveal that fertiliser industry has constantly experienced technical progress over time. Analysis of hypothesis testing resulted in rejection of homotheticity as well as the homogeneity of the output in inputs over the study period. On the hand, Hicks neutrality is accepted and the absence of technical change is rejected. The results of the econometric approach are substantiated by the findings of the index number approach. The industry has shown a positive TFP growth over the years of the study. During the entire study period, three significant structural breaks were found in the trend growth rate of productivity in the fertiliser industry. Estimates on Partial Factor Productivity (PFP) indices reveal that inputs have been used efficiently in this industry.

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