

**ESTIMATION OF PRODUCTION FUNCTIONS  
FOR INDIAN INDUSTRY**

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*BY*

**SANGEETA KURULKAR**

**GOKHALE INSTITUTE OF POLITICS & ECONOMICS**

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(iii)

CONTENTS

		<u>Page No.</u>
TITLE	...	(i)
ACKNOWLEDGEMENTS	...	(ii)
CONTENTS	...	(iii)
LIST OF TABLES	...	(iv)
INTRODUCTION	...	1
<u>CHAPTER</u>		
I	PRODUCTION FUNCTIONS	3
II	ESTIMATING PRODUCTION FUNCTIONS	23
III	EMPIRICAL ESTIMATIONS FOR	
	INDIAN MANUFACTURING	48
	CONCLUSION	86
	TABLES	92
	BIBLIOGRAPHY	97

LIST OF TABLES

- Table 1 : Estimations for the Manufacturing Sector as a Whole.
- Table 2 : Industrywise Estimates of Elasticity of Substitution, Returns to Scale.
- Table 3 : Estimates of Elasticity of Substitution in Large-scale Indian Industries (1953-65)
- Table 4 : Estimates of Elasticity of Substitution by Kazi (1980) (Two-digit classification)
- Table 5 : Estimates of Elasticity of Substitution by Kazi (1980) (Three-digit classification)
- Table 6a: Estimates of Elasticity of Substitution (Diwan & Leonardson (1985)) (Groupwise)
- Table 6b: Estimates of Elasticity of Substitution (Diwan & Leonardson (1985)) (By Industry Type)
- Table 7 : Elasticities of Substitution for Total Manufacturing, Sectors of All-India and Rajasthan (Rajalakshmi (1985))

## INTRODUCTION

The concept of the production function plays an important role both at the micro and macro economics. At the macro level it is a major tool in theories of growth and distribution. At the micro level it deals with problems such as profit maximization of the firms, factor substitutability, returns to scale.

The concept of the production function, when associated with a particular technological process is supposed to represent the output of one commodity as a function of quantities of various factors of production combined according to a given technology (we rule out joint production).

There are various approaches to the theory of production. Sometimes substitutability of factors of production is ruled out as in the Leontief framework. On the other hand, we have substitutability in the traditional theory. The traditional theory assumes that the factors of production are continuously divisible and productive processes are continuously variable. Thus, it arrives at a smooth and continuous function.

The theory of production, in the set theoretic framework, incorporates the above as special cases. It is a more general theory which embraces the various approaches to the theory of production. So, in the first chapter, we start with the set theoretic framework.

But to obtain the empirical estimates of the parameters

of the production function, we should have framework in which we can specifically define production functions. So to obtain estimates of the production function, we have to go by the traditional theory. In the traditional theory based on the assumption of differentiability, we mainly deal with three forms of production function: the Cobb Douglas production function which has the built in property of unitary elasticity of substitution; the Constant Elasticity of Substitution production function which enables us to obtain an estimate of the elasticity of substitution; the Variable Elasticity of Substitution production function in which the elasticity of substitution is a function of the capital/labor ratio.

In Chapter II, we discuss the methods of estimating these production functions. There are single equation and multi-equation models to estimate these production functions. The various models are based on the assumptions of constant returns to scale, perfect competition, profit maximization.

Chapter III studies the empirical estimations done for Indian manufacturing, both for the whole manufacturing sector and industrywise. These studies provide estimates of the elasticity of substitution, returns to scale and technological progress which vary substantially with the level of aggregation and with assumptions underlying the model. Looking at the empirical evidence, one does realise the need to test for the validity of constant returns to scale, elasticity of substitution and perfect competition.

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