# Contents

*Acknowledgements*  

*Introduction: scope and outline*  

1 Production process and economic analysis of technical change  
2 Plan of the book  

**Part 1 Basic concepts and hypotheses**  

1 Introduction  

2 Technical change and the three economic dimensions of production  
   2.1 The counterpart of Occam’s razor  
   2.2 The nature of technical change  

3 Production and time: preliminary definitions  
   3.1 The microeconomic unit of analysis  
   3.2 Indivisibility  
   3.3 Complementarity  
   3.4 Historical time versus logical time  
   3.5 Ex-ante and ex-post analysis  

4 Division of labour, specialization and economic efficiency  
   4.1 Learning processes, specificity of resources and different organizational systems  
   4.2 Economic efficiency and production organization  

**Part 2 The model and its application**  

5 Introduction  

6 Production as a sequential process  
   6.1 The elementary process  
   6.2 Parallel and line production  
   6.3 Babbage’s factory principle and firm’s growth  

7 The matrix of production elements  
   7.1 The decomposability of an elementary process  
   7.2 Time profile of the production process: some further specifications  
   7.3 The matrix of production elements
Table of Contents

8 Transformation of the matrix of production elements for empirical research
  8.1 The quantitative and temporal matrix
  8.2 The organizational scheme

9 Towards empirical implementation: some case studies
  9.1 Preliminary methodological considerations
  9.2 The textile industry
  9.3 Some remarks on the results of the case studies
  9.4 Case A
  9.5 Case B
  9.6 Case C
  Appendix: Interviews and tables: Case studies A, B and C

A9.1 Production unit A
A9.2 Production unit B
A9.3 Production unit C

Part 3 Economies of scale, economies of scope and production flexibility

10 Introduction

11 Economies of scale
  11.1 Returns of scale, complementarity and indivisibility
  11.2 Economies of scale, productive capacity and adaptability
  11.3 Cross-section analysis, time series analysis and methods of collecting data on costs
  11.4 Microeconomic unit and operational levels
  11.5 Economies of scale and technological change
  11.6 Concluding remarks
  Appendix: Factors underlying economies and diseconomies of scale

A11.1 Economies of scale
A11.2 Diseconomies of scale

12 Flexible production systems and economies of scope
  12.1 Different concepts of flexibility
  12.2 Adaptability, operational flexibility and economies of scope
  12.3 Market differentiation and economic instability
  12.4 Flexibility without flexible technology
  12.5 The impact of computer-based technology
  12.6 Conclusions
  Appendix: Flexibility, set-up time, just-in-time production and CIM–CAM definitions

A12.1 Relationship between production flexibility and set-up times: a numerical example
A12.2 Just-in-time production systems
A12.3 Computer-integrated and computer-aided manufacturing: some definitions

References

Index