TOPICS IN PRODUCTION THEORY

This volume is devoted to current topics in production theory. The papers are organized under four headings. Part I deals with *technical change*. *Jorgenson* reports on econometric research on production functions for a large number of production sectors as part of a general equilibrium model of an economy. *Førsund* and *Jansen* focus on *one* industrial sector and study structural and technical change within the Norwegian aluminum industry, using Leif Johansens's concept of a short-run industry function. *Kopp* and *Smith* measure the effects of technical change on an even more disaggregated level. Two large-scale process analysis models provide a description of the production technology with the possibility of applying six specific process innovations. *Baumol* and *Wolff* outline a model which takes into account not only the contributions of R & D to the rate of growth of an economy's productivity, but also the likelihood that there is a relationship in the other direction.

Part II is devoted to *efficiency*. *Diewert* uses a comparative static framework and duality theory to characterize two measures of the loss to the economy brought about by distortions in the resource allocation in the production sector. *Färe*, *Grosskopf* and *Lovell* start out from Farrell's measure of productive efficiency and study nonparametric measurements of efficiency under less restrictive assumptions on technology.

The papers in Part III deal with *aggregation*, *quasi-fixed factors* and *cost of adjustment*. *Epstein* addresses the problem of aggregating quasi-fixed factors in the context of an adjustment-cost model. *Blackorby* and *Schworm* investigate the conditions under which – in adjustment-cost models – aggregates for heterogeneous capital and investment exist for individual firms and the conditions under which the sum of wealth functions over firms depends only on aggregate capital. *Pindyck* and *Rotemberg* model the industrial demand for structures, equipment and blue- and white-collar labor in a manner consistent with rational expectations and stochastic dynamic optimization in the presence of adjustment costs. *Brown* and *Greenberg* investigate the conditions under which the Divisia index of total factor productivity for all production units is path independent within a general equilibrium framework.

Other aspects of production theory are present in Part IV. *Vislie* analyzes the optimal use of inputs for producing goods which take a long time to complete, when prices of inputs may change at some unknown future date. *Bosworth* and *Pugh* deal with the degree of capital utilization. In particular, increased utilization results in more rapid depreciation of the capital stock. *Hamlin* and *Heathfield* analyze consequences of the rate of profit being the maximand for a firm and examine *ex ante* employment, investment and shiftwork decisions in a putty-clay model when output and prices are given. *Mizon* and *Nickell* present estimates of a vintage production model for the U.K., with the aim of discovering whether it is possible to explain satisfactorily the output of manufacturing industries as a simple, stable function of a small number of input aggregates.

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