



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# Empirical Analysis as the Application of Theory

*Applied Production Analysis. A Dual Approach.*  
By Robert G Chambers Cambridge Cambridge  
University Press, 1988, 331 pages, \$18.95 (paper),  
\$49.50 (hardcover)

*Reviewed by Bruce A. Larson*

Hypothesizing that empirical analysis is a rigorous form of theoretical investigation using real-world data, this book provides a concise and focused treatment of the theory of the firm under certainty using the dual approach. Written from the point of view that empirical analysis (and theoretical analysis) is a prisoner of its underlying assumptions, this book stresses the links and possible tradeoffs between theoretical assumptions and empirical necessity. While most of the material in the book is available in previous articles and books, graduate students and economists not schooled in the dual approach—the intended audience—will for the most part appreciate the book's simple style (basic calculus and linear algebra). The author offers a synthesis of more technical literature and a discussion of some fundamentals for applied economics, such as separability, aggregation, technical change, and flexible functional forms. Applied economists will probably find the book a useful reference in day-to-day research.

The "economics" underlying the dual approach utilized by Professor Chambers is simple and focused: the firm has a technology that uses variable and fixed inputs to produce outputs, the firm chooses variable inputs to minimize costs of producing a given level of outputs, and, when appropriate, the firm chooses outputs to maximize profits (revenues minus costs). Thus, the logic of the book's structure is clear. The basic properties and characteristics of production functions are explained and developed first. The cost function follows from the cost-minimization hypothesis, given a production function. And, the profit function follows from the profit-maximization hypothesis, given a cost function, which, in turn, presumes a production function.

The core chapters on the production, cost, and profit functions are developed in a straightforward manner. The topic-oriented chapters, which pull together and

simplify a large amount of rather technical material, provide the extra level of understanding and perspective needed for empirical research. For example, while the duality approach presupposes firm-level optimizing behavior, empirical studies often rely on data aggregated across firms as well as across inputs and commodities, a point that may be underemphasized in graduate microeconomic theory courses. Thus, I suspect the sections on aggregation across firms and separability, which allow aggregation across commodities and prices, will be most informative. However, the discussion of the uses of separability (p. 118), which introduced the notion of index numbers, surprisingly did not introduce or at least mention some frequently used indexes, such as the Divisia index. The Divisia index was not introduced until the discussion of measures of technical change (p. 230).

Using a parametric approach for empirical research means that nothing can be done without choosing a functional form. Here, Professor Chambers provides a reasonable perspective on the choice of a functional form and what one can expect from flexible functional forms: "choosing a functional form is more a craft than a science" (p. 159), "the main attraction of flexible forms does not lie in their ability to closely approximate arbitrary technologies" (p. 179), and "even if flexible forms are not restrictive, their ability to approximate arbitrary technologies is limited" (p. 177). The concept is clear: empirical (and theoretical) research necessarily involves assumptions, and it is imperative to understand how these assumptions influence and condition results.

While the author acknowledges that the chapter on technical change is primarily a catalog of certain types of technical change, the energy was well spent on the discussion. The emphasis on disembodied technical change is appropriate given the objective of the book and the seemingly unlimited ability of time trends to appear in empirical studies to represent technical change. The discussion of various terms and definitions that surround the measurement of technical change (Hicks neutrality, Harrod neutrality, factor augmenting, embodied, disembodied) methodically develops the effects of technical change in production on costs and profits.

The book carves a useful niche in the set of economic texts and supplementary reading packets. It lands

Larson is an economist with the Resources and Technology Division, ERS.

between more elementary (non-Ph.D.level) texts and those more rigorously developed, although the intended audience may wonder why certain proofs were "left to the reader" or considered to be "beyond the scope" of the book. The book generally accomplishes

what it intends to do, but there is still a gap to be filled by a text that would assist the applied researcher struggling with a dynamic and uncertain world. Perhaps Chambers will turn his attention to these issues in future editions.

**mouton de gruyter**

Berlin New York



**europaean review  
of agricultural economics**

**Editor:** Arie Oskam  
Agricultural University  
Wageningen, The Netherlands

The **European Review of Agricultural Economics** serves as a forum for discussions about the development of theoretical and applied agricultural economics research in Europe and for stimulating ideas regarding the economic problems of agriculture in Europe and other parts of the world.

The **ERAE** also promotes discussion on national resource use, protection of the environment, marketing of agricultural products and development of rural areas. Throughout, the **ERAE** strives for balanced coverage of all issues in agricultural economics: production economics, operations research and farm management problems, agricultural policy, including farm incomes and farm structure, regional planning and rural development, supply analysis, factor markets, demand analysis and marketing, international trade and development, statistical and econometric methods, etc. Original articles as well as full or abstracted articles which have already appeared in national publications and/or in other languages are included. Shorter features supplement the main contents and ensure that the most recent information available is covered. These features include research notes, book reviews, comments on previously published articles and news items about European activities in the field of agricultural economics such as meetings and conferences.

The **European Review of Agricultural Economics** is published as one volume of four issues per year (approximately 512 pages).

**Subscription rates for Volume 17 (1990):**

Institutions/libraries	DM 198 00
Individuals (prepaid only*)	DM 116 80 (includes postage)
Single issues	DM 57 00

**Prices in US\$ for subscriptions in North America only:**

Institutions/libraries	US\$ 115 00
Individuals (prepaid only*)	US\$ 46 70 (includes postage)

\* Subscriptions for individuals are for personal use only and must be prepaid and ordered directly from the publisher. Prepayment may be made by cheque or by credit card: MasterCard (Access), EuroCard, Visa, and American Express (Amex may not be used in North America). Orders placed for institutions will be invoiced at the institutional rate. The individual rate is not available in the FRG, Switzerland, or Austria.

Institutional subscriptions, single, or back issues can be ordered from your local bookseller or subscription agent or directly from **MOUTON DE GRUYTER**, (a division of Walter de Gruyter) at either of the following addresses:

**For North America:**  
Walter de Gruyter Inc  
200 Saw Mill River Road  
Hawthorne, N.Y. 10532  
USA

**For all other countries:**  
Walter de Gruyter & Co  
Postfach 11 02 40  
D-1000 Berlin 11  
Federal Republic of Germany