

BOOK REVIEWS

Energy Demand: Evidence and Expectations, edited by David Hawdon (Surrey University Press in association with Academic Press Harcourt Brace Jovanovich Publishers, 1991), 255 pages.

With the interruptions in the 1970s, energy seemed to be "not enough of a good thing." With pollution concerns in the 1990s, energy seems to be "too much of a good thing." Nevertheless, much effort was exerted since 1973 investigating energy demand. *Energy Demand: Evidence and Expectations* is a valuable addition to this work. It begins with three surveys of existing work, adds four new studies on energy demand in industrial, transport, and residential markets, and concludes with a paper assessing official demand forecasts and another forward-looking paper on recent developments in continuous-time modelling of energy demand.

The first three surveys give us a look back which provides lessons for the future. Leonard Waverman looks at energy demand estimation by fuel type with a focus on substitutability. He argues philosophically that a cross elasticity greater than one implies close substitutability. From his convenient survey of own and cross price elasticities of 15 econometric energy demand studies by fuel type on various industrial countries done in the 1980s, he concludes that cross elasticities of demand tend to be below 0.15, that only gas and oil should be considered good substitutes, and that consequently most fuels should be treated as if in separate markets.

Campbell Watkins draws on his wide experience in energy modelling to survey issues, techniques, and results of energy demand modelling. He provides a valuable overview to anyone interested in methodological issues or as background for those doing new studies in industrial energy demand.

Third generation models of industrial energy demand, which include both short- and long-run effects, are found disappointing because the data employed in their estimation are insufficient to the task at hand. Therefore, second generation static models with flexible functional forms are relied upon to investigate Canadian manufacturing productivity changes. His technical appendices include an unique discussion of problems in forecasting with share equations.

David Hawdon surveys 11 U.S. and U.K. studies on experiments in time- of-day pricing and concludes that own and cross price elasticities exist but are small. His discussion of the advantages and disadvantages of such experiments, their elasticity estimates, and suggestions for other approaches such as reference techniques or contingency valuation should be useful background

for utility planners interested in designing experiments or implementing time-of-day pricing.

The following four individual studies on demand for energy by various sectors — industrial, transport, and household — show interesting results and are useful to modellers undertaking similar studies for their methodological content.

Alan Ingham, James Maw, and Alistair Ulph present an improved vintage capital model for U.K. energy manufacturing demand. They use the flexible functional forms with substitution *ex ante* as well as *ex post* and allow the vintage structure of technology to be investigated. They explain the changes in energy output ratios in the U.K. from 1971-1987 in terms of changes in output, factor prices, technology. They conclude that half of the improvement in energy conservation was exogenous technical change. Energy price played a dominant role in the first decade but was superseded by general technological change later on. *Ex post* substitution was a significant factor, also.

Hunt and Lynk consider the difference between short-run and long-run industrial energy demand using the time series concept of co-integration. From their error correction model for 1948-1988, they found that a long-run equilibrium energy demand function for U.K. manufacturing existed. The long-run parameter values from this model are given along with a worthwhile summary of other estimates of U.K. industrial energy demand.

J. M. Dargay looks at reversibility of motor fuel demand in France, Germany, and the U.K. for 1960-88. Using an error correction model, she allows for asymmetries between elasticities for increasing and decreasing prices as well as for asymmetries for prices above previous maximums. She finds differing but significant price elasticities for all three countries with the reversibly model performing better than the irreversible in all cases.

Paul Baker models household energy demand using an impressive micro data set for 1971-88 with over 112,000 observations. An extended, almost ideal model is used to estimate and forecast household energy demand for gas and electricity. He presents share of electricity and share of gas equations for homes with both connections as well as a share of electricity for homes not connected to the gas grid. Discussion is focused on price, income, and temperature elasticities, which are found to vary significantly with household characteristics.

In a slightly different vein, Colin Robinson considers official producer forecasts. Although he focuses on forecasts made by the U.K. Central Electricity Generating Board before privatization, the issues he raises have relevance in many forecasting contexts. Given forecast feedback, it is rational for forecasters and organizations to employ forecasts in their own self interests rendering forecasts into policy instruments. His article is a useful reminder of this point to both makers of and users of forecasts and would be quite appropriate for econometrics courses where we sometimes forget to emphasize to our students that forecasting is an art rather than a science.

The book ends with a forward look through K.B. Nowman's theoretical discussion of continuous time econometric modelling of energy demand. Systems of second order stochastic difference equations deal with the fact that economic decisions are made continuously while data only capture the decisions discretely. Nowman has developed a computer model for estimating these systems that yields exact maximum likelihood estimates when the errors are Gaussian and exogenous variables are polynomials in time with degree less than or equal to two. Since the program requires the powers of a Cray computer, it may be some time before this impressive technical achievement will be within the reach of the average energy modeller.

Overall, I found the quality of the book consistently high. The text for the most part is clear and concise with the more technical material relegated to appendices. More care could have been taken in editing the volume correcting typos and making sure that variables, graph axis, and tables were all clearly labelled. As with any edited volume different sections will be useful to different audiences as noted above. In general, it should prove worthwhile to both producers and consumers of energy demand analysis, and I am pleased to have this volume on my shelf.

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Kenneth E. Train, *Optimal Regulation: The Economic Theory of Natural Monopoly*, (Cambridge, MA: The MIT Press, 1991), 315 pages.

Professor Train has written this book to serve as a text in a course on regulation designed for advanced undergraduate and graduate students. An important objective of the author is to bring together in one book the most important topics on regulation so as to eliminate the need for student to read the original articles.

The author has tried hard to avoid the use of mathematics, other than very simple algebra and geometry. With one minor exception, calculus is not used at all. But there is heavy reliance on geometry, and sometimes the geometry gets quite complicated and difficult to follow. I doubt, for example, that students would find the diagrams in Figures 2.14-2.17 any easier to understand than algebra or even calculus.

The author does an excellent job in the introductory chapter of explaining why it is to society's benefit to have a (natural) monopoly as the sole supplier in exchange for being regulated and why first-best pricing is not a

viable solution. The Averch-Johnson (AJ) model, both under certainty and uncertainty, is discussed at length. A nice aspect is the review of the works of Courville and Bailey as attempts to empirically test the AJ model. True to its title, however, the book is heavily tilted toward theoretical discussions; instructors would have to assign other material if they wish to weight empirical matters more heavily.

Chapter 4 is devoted to a careful and easy-to-follow explanation of Ramsey prices, their significance and how to find them. An actual case (the AC Transit bus and BART train services of the San Francisco Bay Area) is used to demonstrate the use of Ramsey pricing.

Subsequent chapters discuss the various schemes proposed to induce public utilities to implement Ramsey pricing. Chapter 5 presents the Vogelsang-Finsinger (VF) mechanism which seeks to simplify the Ramsey rule, including the explicit recognition of the asymmetry in information which (is assumed to) exist in regulatory settings. Chapter 6 discusses the possibility of using subsidies—so that the firm covers all its cost when using marginal-cost pricing—to induce public utilities to pursue first-best pricing policies. Both the case when the regulators have knowledge of the firm's demand, and the case when such knowledge is absent, are discussed.

Chapter 7 is devoted to an extensive discussion of multipart tariffs. The topic covered in this chapter is important and interesting for two reasons. First, multipart tariffs are commonly used by many utilities (the major exception being bus service). And second, many schemes are demonstrated to be equivalent (e.g., Coase's demonstration that the combination of access and use fees is equivalent to marginal pricing with subsidy). Chapter 8 presents time-of-day pricing. While the concept has been studied for many decades, it has gained interest during the past decade at least in part as a result of electric utilities having experienced disallowances on their investment and the imposition of high environmental cost on some of their activities. In turn, these have encouraged utilities and their regulators to attempt to move load from peak to off-peak so that the need for capacity expansion is reduced. Among other reasons for heightened interest in peak/off-peak pricing has been traffic congestion.

Chapter 9 covers the topic of self-selecting tariffs, another area grown quite popular in recent years. Chapter 10 reviews arguments opposing regulation. The concepts of contestability and sustainability of prices, and the circumstances under which we can rely on markets to regulate monopolies are covered in this chapter. Finally, an appendix covers the topic of "price caps" as a means of regulating firms.

The book is a good text for a first course in public utility regulation. I found the book unbalanced at points, especially in the early chapter. While much of the material is advanced, requiring a fair degree of economic sophistication, the book also covers highly elementary material such as: "higher isocost lines represent higher costs" (p.23); "whenever marginal revenue is

negative, the firm will decrease its output" (p.30); and the diagram depicting the relationship between marginal revenue and demand price elasticity (p.31). Perhaps a second printing will drop such passages, as well as correcting at least one significant error that I discovered: Lines 2-5 of p. 150 do not belong where they are; they merely repeat lines 3-6 of paragraph 3 of the same page.

I would have liked a somewhat more serious discussion of the pros and cons of regulation, especially since deregulation seems to preoccupy many economists and policy-makers. I found it interesting that in the last paragraph of the main text (p.315) the author concludes: "direct regulation and reliance on market forces are not so very different in practice..." My immediate reaction was why then regulate at all, especially in view of what the author says in the first paragraph of that same chapter (p.297): "any observer of regulatory process...can easily identify areas of extensive waste, mismanagement, missed opportunities, and other social ills."

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Errata

The paper by Robert Mabro "OPEC and the Price of Oil" in Vol. 13, No.2 of *The Energy Journal* was his acceptance speech for the IAEE's Distinguished Contributions Award (1990). Since 1981, the IAEE has awarded a prize annually for outstanding contributions to the field of energy economics and to its literature.

The editors regret that the paper by T. J. Considine "A Short-Run Model of Petroleum Product Supply," in Vol. 13, No. 2 contained the following errors. Thus, the corrections below should be noted:

page 65, in equation (4): $\sum_i v_{it}$ should be $\sum_i v_{it} X_{it}$

page 71, in equation (7): $\ln C_t$ should be $\ln c_t$

page 71, in equation (7): $\sum_{i=1}^7 x_i \ln K_{it}$ should be $\sum_{i=1}^7 x_i \ln X_{it}$

page 72, in equation (10): $C_k(I_t)$ should be $c_k(I_t)$

page 86, in Table 7, col. 4, line 4: "-0.7" should be "-0.07"

Due to printer error, two pages were printed blank (p. 157-158) in place of a Book Review by A. M. Reza in Vol. 13, No. 2. The omitted Book Review is reprinted in this issue.