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Pages 1-35

A Quantitative Analysis of Pricing Behavior in California's Wholesale Electricity Market During Summer 2000

by Paul L. Joskow (Massachusetts Institute of Technology, Cambridge, MA, USA) and Edward Kahn (Analysis Group/Economics, San Francisco, CA, USA)

Abstract

During the Summer of 2000, wholesale electricity prices in California were nearly 500% higher than they were during the same months in 1998 or 1999. This price explosion was unexpected and has called into question whether electricity restructuring will bring the benefits of competition promised to consumers. The purpose of this paper is to examine the factors that explain this increase in wholesale electricity prices. We simulate competitive benchmark prices for Summer of 2000 taking account of all relevant supply and demand factors—gas prices, demand, imports from other states, and emission permit prices. We then compare the simulated competitive benchmark prices with the actual prices observed. We find that there is a large gap between our benchmark competitive prices and observed prices, suggesting that the prices observed during Summer 2000 reflect, in part, the exercise of market power by suppliers. We then proceed to examine supplier behavior during high-price hours. We find evidence that suppliers withheld supply from the market that would have been profitable for price-taking firms to sell at the market price.

Pages 37-56

Petroleum Tax Reform Proposals in Norway and Denmark

by Diderik Lund (Department of Economics, University of Oslo, Norway)

Abstract

During the past two years similar petroleum tax reforms have been proposed in Norway and Denmark. Both were based on results on neutral taxation derived by Boadway and Bruce (1984) and Fane (1987). In this paper the main features of the proposals are presented, and important problems of implementation are highlighted. Topics for further research are also pointed out. While the risk characteristics of tax deductions caused major disagreements between experts and oil companies, the after-tax cost of capital for risk free cash flows is a question less clearly resolved within the economics literature. Another topic for disagreement is value additivity, disputed by the companies.

Pages 57-84

Micro Econometric Modelling of Household Energy Use: Testing for Dependence between Demand for Electricity and Natural Gas

by Søren Leth-Petersen (AKF, Institute of Local Government Studies-Denmark, Copenhagen, Denmark)

Abstract

This paper contains a micro econometric analysis of household electricity and natural gas demand for a cross section of 2,885 Danish households observed in 1996. The sample includes fulltime employed couples in single-family houses. The specification of the model is guided by an explorative nonparametric data analysis. The analysis reveals, among other things, the fairly surprising result that demand for heating is unaffected by the number of children in the household. The dependence between demand for gas and demand for electricity is examined in the paper. This is done by testing for separability of demand for gas from demand for electricity, and vice versa. Separability of electricity (gas) from gas (electricity) is tested by estimating demand for electricity (gas) conditional on demand for gas (electricity). The model allows for endogeneity of the conditional variable. Building regulations and individual time variation, that is panel data, identify the test. The test indicates that demand for electricity is separable from demand for natural gas, and that demand for natural gas is separable from demand for electricity. The result of the test is evidence in favour of single equation modelling of household energy demand in this context.

Pages 85-107

Energy Price, Environmental Policy, and Technological Bias

by Abbas A. Taheri (Associate Professor of Economics, University of Wisconsin-Fox Valley, Menasha, WI, USA) and Rodney Stevenson (Graduate School of Business, University of Wisconsin-Madison, Madison, WI, USA)

Abstract

This paper investigates input biasing characteristics of technology, environmental compliance, and changing energy prices. In particular we wish to investigate whether input biases of technology and environmental compliance are induced by changes in relative fuel prices, or whether there are price induced technology and environmental compliance biases. Using a two-stage optimization, we estimate a truncated third-order translog model by its associated (second order) cost share equations. The model uses two-digit SIC data panel for the period 1974-1991. We find evidence of significant fuel-saving technological bias, while environmental compliance has been significantly fossil fuel using. The results indicate that technology and environmental compliance biases are, in part, induced by changes in relative fuel prices and such induced biases are mainly fuel saving. Finally, our demand elasticity estimates indicate that industrial demand for most fossil fuels and purchased electricity is significantly price inelastic. Policy implications of these results are also briefly discussed.

BOOK REVIEWS

Pages 109-123

A Policy of Discontent: The Making of a National Energy Strategy

by Vito A. Stagliano, Pennwell Press, 2001
(Book Review by Carol Dahl)

Power System Economics: Designing Markets for Electricity

by Steven Stoft, IEEE Press/Wiley, 2002

(Book Review by Frank Felder)

Energy and Environment: Multiregulation in Europe

edited by Piotr Jasinski and Wolfgang Pfaffenberger, Aldershot, UK: Ashgate Studies in Environmental Policy and Practice, 2000

(Book Review by Aggei Semonov)

Alternating Currents: Electricity Markets and Public Policy by Timothy J. Brennan, Karen

L. Palmer and Salvador Martinez, Washington, DC: Resources for the Future, 2002 (Book Review by Peter VanDoren)

Las estrategias de diversificación de las empresas eléctricas (Electric Utilities Diversification Strategies) by Enrique Loredó Fernández, Madrid, Spain, 2000

(Book Review by Jesús Rodríguez-Pomeda)