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Pages 1-6

Energy Economics: A Place for Energy Poverty in the Agenda?

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Abstract

The global energy system faces three major strategic challenges in the coming decades: the growing risk of disruptions to energy supply; the threat of environmental damage caused by energy production and use; and persistent energy poverty. The first two challenges have attracted a lot of attention from the energy-economics community, much less so the need to address the problem of energy under-development. On current trends, the number of people in poor countries relying primarily on traditional biomass for their energy needs will continue to rise, while the number lacking access to electricity will barely fall. To change this course, decisive policy action is needed urgently as part of the broader process of human development. Meeting basic human needs, such as food and shelter, must be at the heart of any strategy to alleviate poverty. Modern energy services help enable those needs to be met. In practice, concrete improvements in human welfare can be realised quickly at modest short-term cost. Strong political will and commitment on the part of the governments of the world's poorest countries will be crucial. Rich industrialised countries have an important role to play in this process too. In addition to moral issues involved, we have obvious long-term economic, political and energy-security interests in helping developing countries along the path to energy development. The cost of providing assistance to poor countries may turn out to be far less than that of dealing with the instability and insecurity that poverty creates.

Pages 7-30

Nonlinear Dynamics in Energy Futures

by Mariano Matilla-García (Departamento de Economía Aplicada Cuantitativa I.
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Abstract

This paper studies the possible nonlinear and chaotic nature of three energy futures: natural gas, unleaded gasoline and light crude oil. Nonlinearity is analyzed using the generalized BDS statistic, along with Kaplan's test. The results show that nonlinearity cannot be rejected. The null hypothesis of chaos is then investigated via the stability of the largest Lyapunov exponent. Evidence of chaos is found in futures returns. Global modelling techniques, like genetic algorithms, have been used in order to estimate potential motion equations. In addition, short term forecasts in futures price movements have been conducted with these estimated equations. The results show that although forecast errors are statistically smaller than those computed with other stochastic approaches, further research on these topics needs to be done.

Pages 31-50

The Supply of Storage for Natural Gas in California

By Rocío Uría and Jeffrey Williams (Post-Doctoral Researcher and D. Barton DeLoach Professor, Department of Agricultural and Resource Economics, University of California, Davis, CA, USA)

Abstract

Do natural gas storage decisions in distant California respond to NYMEX futures price spreads? Daily data about flows into and out of storage facilities in California over 2002-2006 and daily spreads on NYMEX are used to investigate whether the net injection profile is consistent with the "supply-of-storage" curve first observed by Working for wheat. Storage decisions in California do seem to be influenced by a price signal that combines the intertemporal spread and the locational basis between California and the Henry Hub, in addition to strong seasonal and weekly cycles that determine net injections to a considerable extent. The timing and magnitude of the price response differ across storage facilities. Regulatory requirements and operational constraints also limit the response to short-lived arbitrage opportunities.

Pages 51-72

Technical Change Theory and Learning Curves: Patterns of Progress in Electricity Generation Technologies

by Tooraj Jamasb (University of Cambridge, Faculty of Economics, Cambridge UK)

Abstract

Better understanding of the role of learning in technical progress is important for the development of innovation theory and technology policy. This paper presents a comparative analysis of the effect of learning and technical change in electricity generation technologies. We use simultaneous two-factor learning and diffusion models to estimate the effect of learning by doing and learning by research on technical progress for a range of technologies in four stages of development. We find learning patterns broadly in line with the perceived view of technical progress. The results generally show higher learning by research than learning by doing rates. Moreover, we do not find any development stage where learning by doing is stronger than learning by research. We show that simple learning by doing curves overstate the effect of learning in particular for newer technologies. Finally, we find little substitution potential between learning by doing and research for most technologies.

Pages 73-92

CO2 Prices, Energy and Weather

by Maria Mansanet-Bataller (Department of Financial Economics, Avda de los Naranjos s/n, Faculty of Economics, University of Valencia, Spain), Angel Pardo (Department of Financial Economics, Avda de los Naranjos s/n, Faculty of Economics, University of Valencia, Spain) and Enric Valor (Department of Earth Physics and Thermodynamics, University of Valencia, Spain)

Abstract

One of the main objectives of the European Union Emission Trading Scheme is the establishment of a market price level for allowances that show to European CO₂ emitting installations the environmental impact of their polluting

activities. The aim of this paper is to focus on the daily price changes during 2005 in an attempt to examine the underlying rationality of pricing behaviour. Specifically, we study the effect of those weather and non-weather variables that academic and market agents consider as the major determinants of the of CO₂ price levels. The results show that the energy sources are the principal factors in the determination of CO₂ price levels, and that only extreme temperatures influence them.

Pages 93-120

Changes in Electricity Demand in the United States from the 1970s to 2003

by Marvin J. Horowitz (President, *Demand Research*, Fairfax, Virginia)

Abstract

Gaining a better understanding of how electricity demand has changed over the past three decades, particularly in light of government involvement in influencing electricity demand, is an important step towards shaping energy policy in the U.S. and internationally. This study of U.S. electricity demand finds that those states that have moderate to strong commitment to energy efficiency programs reduce electricity intensity relative to what it would have been with weak program commitment; in the residential sector by 4.4 percent, in the commercial sector by 8.1 percent, and in the industrial sector by 11.8 percent. The findings are similar with respect to levels of electricity consumption in the commercial and industrial sectors, but not the residential sector. Moreover, the evidence in this paper indicates that energy efficiency program commitment in all three sectors of the U.S. economy has transformed electricity demand with respect to three key economic variables; electricity price, income as measured by per capita income or gross state product, and technological change. Also, this study finds that nationwide spillover from energy efficiency programs may be rapid and ubiquitous in the residential sector. Estimates of the impact of California's energy efficiency programs confirm the speculation that these efforts have dramatically reduced state electricity intensity; to date, these impacts are likely the upper bounds of the impacts of strong state-level energy efficiency program commitment.

Pages 121-144

Informational Efficiency and Interchange Transactions in Alberta's Electricity Market

by Apostolos Serletis (Department of Economics, University of Calgary, Calgary, Alberta, Canada) and Mattia Bianchi (Dipartimento di Ingegneria Gestionale, Politecnico di Milano, Italy)

Abstract

This paper aims to investigate the informational efficiency of the Alberta electricity market and also the issue of whether interchange transactions (power flows between markets) are becoming increasingly significant factors in electric power markets. In doing so, we use hourly data for all hours, peak hours, and offpeak hours over the period from January 1st, 1999 to July 31st, 2005. In testing the efficiency of the Alberta power market, we use a statistical physics approach – namely the 'detrending moving average (DMA)' technique, introduced by Alessio et al. (2002) and further developed by Carbone et al. (2004a, 2004b), and recently applied to energy futures markets by Serletis and Rosenberg (2007). In analyzing the relationship between power imports and exports and pool prices, we assess whether regulatory changes have modified the causal relationship between import/export volumes and the pool price. According to our results, the electricity market in Alberta is highly inefficient and cross-border trade of electricity between Alberta and neighbouring jurisdictions helps predict the price dynamics in Alberta's electricity market.

Pages 145-164

Price Effects of Boutique Motor Fuels: Federal Environmental Standards, Regional Fuel Choices, and Local Gasoline Prices

by W. David Walls (Professor, Department of Economics, University of Calgary, Alberta, Canada) and Frank W. Rusco (Assistant Director, Centre for Economics, U.S. Government Accounting Office, Washington D.C., USA)

Abstract

Federal clean air regulations have spawned a proliferation of motor fuel types that have created differentiated markets for motor fuels, increased the cost of supplying these fuels, and reduced the capacity of the supply infrastructure. In this paper we examine wholesale gasoline prices in 99 US cities over a time horizon of 204 weeks using a panel data regression model to explain fuel prices as a function of fuel attributes, the price of crude oil, and seasonal and citymarket-specific effects. Our results show that fuel prices are related to the use of a special blend not widely available in the region and more costly to make, and

the situation of the particular city market in relation to major refining centers or other sources of supply.

Pages 165-186

An Oligopolistic Electricity Market Model with Interdependent Segments

by Pierre-Olivier Pineau (HEC Montréal, Canada) and Georges Zaccour (Chair in Game Theory and Management, GERAD & HEC., Montreal, Quebec, Canada)

Abstract

In this paper, we model a two-period electricity market with interdependent demand, where oligopolistic generators make investments in peak- and baseload capacities. Different prices are obtained in the two periods, and residential consumers can react to prices across demand periods. We characterize the Cournot equilibrium obtained as a function of price and cross-price effects and present a numerical illustration based on the Ontario (Canada) electricity market.

BOOK REVIEWS

Pages 187-189

Gas Prices in the UK: Markets and Insecurity of Supply

by Philip Wright (Oxford Institute for Energy Studies: 2006)
(Book Review by Richard Green)

Pages 189-192

Sustainable Fossil Fuel: The Unusual Suspects in the Quest for Clean and Enduring Energy

by Mark Jaccard (Cambridge: The Cambridge University Press: 2005)
(Book Review by Richard L. Gordon)

