Volume 27, Issue 3

July, 2006

Pages 1-8

A Note on Price Asymmetry as Induced Technical Change

by Hillard G. Huntington (Executive Director, Energy Modeling Forum, Stanford University)

Abstract

This note evaluates whether fixed time effects (yearly dummy variables) are a better representation than separate price-decomposition terms for induced technical change in energy and oil demand. Fixed time effects are a proxy for all omitted variables that change similarly over time for all countries. Many of these omitted variables have little relevance to technical change. Empirically, statistical tests applied to previous studies reject an important premise of the fixed-time-effect model that energy or oil demand responds symmetrically to price increases and decreases. Moreover, when price-decomposition techniques allow for price-asymmetric responses, the estimated income elasticities are not dramaticalxly different from their fixed-time-effect counterparts, as it is sometimes alleged. There are also practical reasons for choosing models that allow for asymmetric responses to price, especially when evaluating the longrun implications of a number of important energy and environmental issues.

Pages 9-24

Examining Asymmetric Behavior in US Petroleum Futures and Spot Prices

Bradley T. Ewing (Rawls Endowed Professor in Operations Management, Texas Tech University), Shawkat M. Hammoudeh (Professor of Economics, Drexel University) and Mark A. Thompson (Associate Research Professor, Institute for Economic Advancement, University of Arkansas at Little Rock)

Abstract

This paper uses the momentum-threshold autoregressive (M-TAR) model to examine the possible asymmetric relationship between petroleum futures and spot prices for three different markets: crude oil, heating oil, and gasoline in the United States. The results indicate that the futures and spot prices for each petroleum type are cointegrated when allowing for asymmetric adjustment for each of these energy markets. We further investigate the asymmetric behavior between the futures and spot prices by estimating the M-TAR error-correction model. The M-TAR model allows us to document the adjustments that these markets undergo in response to changes in the basis.

Pages 25-48

Options and Instruments for a Deep Cut in CO2 Emissions: Carbon Dioxide Capture or Renewables, Taxes or Subsidies?

Reyer Gerlagh (Vrije Universiteit Amsterdam, Institute for Environmental Studies) and Bob van der Zwaan (Energy Research Centre of the Netherlands and Harvard University, John F. Kennedy School of Government)

Abstract

The recent volatility of short-run gasoline prices in the United States has resulted in calls for the government to intervene. This paper details a simple means of reducing that variability, utilizing federal tax policies, without eliminating the signaling role of prices in the medium- to long-term. If properly implemented, the gyrations in gas prices could be largely removed, with little impact on the revenue that the federal government generates through taxation. If applied to the markets in nations that have significantly higher gasoline taxes, essentially all price volatility could be removed.

Pages 49-64

Valuation of International Oil Companies

Petter Osmundsen (Professor in Economics), Frank Asche (Professor in Economics), Bård Misund (Research Fellow, Department of Industrial Economics, University of Stavanger), and Klaus Mohn (Research Fellow, Department of Industrial Economics, University of Stavanger)

Abstract

According to economic theory, exploration and development of new oil and gas fields should respond positively to increasing petroleum prices. But since the late 1990s, stock market analysts have focused strongly on short-term accounting return measures, like RoACE , for benchmarking and valuation of international oil and gas companies. Consequently, exaggerated capital discipline among oil and gas companies may have reduced their willingness to invest for future reserves and production growth. Based on panel data for 14 international oil and gas companies for the period 1990–2003, we seek to establish econometric relations between market valuation on one hand, and simple financial and operational indicators on the other. Our findings do not support the general perception of RoACE as an important valuation metric in the oil and gas industry. We find that the variation in company valuations is mainly explained by the oil price, oil and gas production, and to some extent reserve replacement.

Pages 65-90

From Investor-owned Utility to Independent Power Producer

by Jun Ishii (Department of Economics, University of California, Irvine)

Abstract

We examine the issue of why some parent companies of U.S. electric utilities have expanded into domestic independent power production (IPP) but not others. We evaluate the conjecture that the parent companies who have chosen to participate in recently restructured U.S. wholesale electricity markets are those with the most generation cost advantages. Specifically, we empirically investigate the link between apparent advantages in two types of generation costs — operation & maintenance (O&M) and capital — and the IPP participation decision. We use electric utility data from FERC Form 1 and combine it with IPP data collected from various industry sources. The data is analyzed using both a descriptive approach and a simple, empirical competitive entry model. We find that utilities with lower O&M costs are more likely to expand into IPP. Also, utility financial characteristics, reflecting possible capital cost advantages, seem to matter mainly for the largest utilities.

Pages 91-112

Is the Strategic Petroleum Reserve our Ace in the Hole?

by Timothy J. Considine (The Pennsylvania State University)

Abstract

The Strategic Petroleum Reserve (SPR) is often touted as a vital asset in mitigating the adverse effects of oil supply disruptions on the economy. The importance of SPR, however, largely depends upon the effect of stock sales on market prices. To address this question, this study develops a monthly econometric model of the world crude oil market. Inventories, consumption, production, and prices for crude oil are determined within a dominant producer pricing framework in which Saudi Arabia adjusts output based upon market demand and competitive fringe supply. The estimation results provide additional support for the dominant producer pricing model for world oil markets and reasonable estimates of short-run supply and demand elasticities. Several model simulations are conducted to assess the impacts of SPR policies. For example, the gradual build-up of the SPR by the Bush Administration resulted in a very small, almost imperceptible increase in world prices. Similarly, the Clinton sale from SPR had minor impacts on market prices. Another simulation indicates that while SPR sales can lower world prices during a supply shock, the required drawdown would be so substantial the reserve would be significantly depleted after just a few months. These findings suggest that once played, the SPR card has modest impacts on world prices and could be easily trumped by actions of other players, including output adjustments by world oil producers.

Pages 113-134

The Timing of Biological Carbon Sequestration and Carbon Abatement in the Energy Sector Under Optimal Strategies Against Climate Risks

by Vincent Gitz, Jean-Charles Hourcade and Philippe Ciais

Abstract

This paper addresses the timing of the use of biological carbon sequestration and its capacity to alleviate the carbon constraint on the energy sector. We constructed a stochastic optimal control model balancing the costs of fossil emission abatement, the opportunity costs of lands allocated to afforestation, and the costs of uncertain climate damages. We show that a minor part of the sequestration potential should start immediately as a “brake”, slowing down both the rate of growth of concentrations and the rate of abatement in the energy sector, thus increasing the option value of the emission trajectories. But, most of the potential is put in reserve to be used as a “safety valve” after the resolution of uncertainty, if a higher and faster decarbonization is required: sequestration cuts off the peaks of costs of fossil abatement and postpones the pivoting of the energy system by up to two decades.

Pages 135-168

Modeling Economy-wide vs Sectoral Climate Policies Using Combined Aggregate-Sectoral Models

by William Pizer, Dallas Burtraw, Winston Harrington,
Richard Newell, and James Sanchirico (Senior Fellows at Resources for the Future)

Abstract

Economic analyses of climate change policies frequently focus on reductions of energy-related carbon dioxide emissions via market-based, economy-wide policies. The current course of environment and energy policy debate in the United States, however, suggests an alternative outcome: sectorbased and/or inefficiently designed policies. This paper uses a collection of specialized, sector-based models in conjunction with a computable general equilibrium model of the economy to examine and compare these policies at an aggregate level. We examine the relative cost of different policies designed to achieve the same quantity of emission reductions. We find that excluding a limited number of sectors from an economy-wide policy does not significantly raise costs. Focusing policy solely on the electricity and transportation sectors doubles costs, however, and using non-market policies can raise cost by a factor of ten. These results are driven in part by, and are sensitive to, our modeling of pre-existing tax distortions.

BOOK REVIEWS

Pages 169-171

The Regulation of Power Exchanges in Europe

by Martha M. Roggenkamp and François Boisseleau, Eds. (Intersentia, 2005)
(Book Review by James Chalker, Esquire)

Pages 171-173

The Urban Household Energy Transition Social and Environmental Impacts in the Developing World

by Douglas F. Barnes, Kerry Krutilla, and William F. Hyde, ISBN 1-9333115-07-6,

Washington D.C., Resources for the Future
(Book Review by Carol Dahl)

Pages 174-176

Sustainable Energy in Developing Countries: Policy Analysis and Case Studies

by Peter Meier and Mohan Munasinghe, (Edward Elgar, 2005)
(Book Review by Franz Wirl)

Pages 176-181

The Economics of Energy Vol. I and II

edited by Paul Stevens, (Cheltenham, UK; Northhampton, MA, USA: An Elgar Reference Collection, 2000)
(Book Review by Carol Dahl)

Pages 181-184

The Future of Russian Gas and Gazprom

by Jonathan P. Stern, (Oxford University Press for the Oxford Institute of Energy Studies, 2005)
(Book Review by Zauresh Atakhanova)