Oil Price Forecasting in the 1980s: What Went Wrong?

by Hillard G. Huntington (Stanford University)

Abstract

This paper reviews forecasts of oil prices over the 1980s that were made in 1980. It identifies the sources of errors due to such factors as exogenous GNP assumptions, resource supply conditions outside the cartel, and demand adjustments to price changes. Through 1986, the first two factors account for most of the difference between projected and actual prices. After 1986, misspecification of the demand adjustments becomes a particularly troublesome problem.

Environmentally Responsible Energy Pricing

by W. Kip Viscusi, Wesley A. Magat (Duke University), Alan Carlin (U.S. EPA), and Mark K. Dreyfus (National Economic Research Associates)

Abstract

This paper assesses the value of the non global warming externalities associated with energy use. The estimates of the full social cost energy prices based on this "no regrets" approach imply environmental costs that often greatly exceed current tax amounts. The midpoint estimates suggest that the price of coal is most out of line with its efficient level. Natural gas is currently overtaxed, and gasoline is appropriately taxed. There is also a substantial range of uncertainty embodied in the no regrets estimates.
by Adam B. Jaffe (Harvard University) and Robert N. Stavins (Harvard University and Resources for the Future)

Abstract

Concern about carbon dioxide as a greenhouse gas has focused renewed attention on energy conservation because fossil fuel combustion is a major source of CO$_2$ emissions. Since it is generally acknowledged that energy use could be significantly reduced through broader adoption of existing technologies, policy makers need to know how effective various policy instruments might be in accelerating the diffusion of these technologies. We examine the factors that determine the rate of diffusion, focusing on (i) potential market failures: information problems, principal-agent slippage, and unobserved costs, and (ii) explanations that do not represent market failures: private information costs, high discount rates, and heterogeneity among potential adopters. Through a series of simulations we explore how alternative policy instruments—both economic incentives and more conventional, direct regulations—could hasten the diffusion of energy-conserving technologies.

Pages 67-88

Estimating Consumer Energy Demand Using International Data: Theoretical and Policy Implications

by Dale S. Rothman (World Resources Institute), J. Ho Hong and Timothy D. Mount (Cornell University)

Abstract

In this paper, consumer energy demand is estimated as part of a complete demand system using a consistent set of international data on prices and expenditures for 53 countries ranging from the poorest to the wealthiest. We compare three models: the Translog, the Deaton-Muellbauer Almost Ideal Demand System (DM), and the Generalized Logit (Logit), and two levels of commodity aggregation (6-good and 9-good). The estimation results indicate that the model specification and level of aggregation are important. The Logit model performs better than the Translog and D-M models which provide illogical elasticity estimates for many countries. The 9-good model shows that the demand for electricity is significantly more price and income elastic than the demand for primary energy.

Pages 89-106

Residential Energy Demand and the Taxation of Housing
by William M. Gentry (Duke University)

Abstract

This paper examines how the favorable tax treatment of housing capital in the U.S. affects the demand for residential energy. Relative to a tax system that is neutral between different investments, the current taxation of housing lowers the cost of housing capital by 23%. The tax subsidy for housing capital increases the demand for housing services and the concomitant energy demand and creates an incentive for the substitution of capital for energy in the production of housing services. Eliminating this tax subsidy for housing would lower the demand for housing services by 11.8% and residential energy demand by 6.8%. Alternatively, the same reduction in residential energy demand could be obtained through a 20% tax on residential energy.

Pages 107-124

Measuring Economic Markets for Imported Crude Oil

Douglas G. Sauer (Boise State University)

Abstract

A previous paper by Weiner (1991) noted that many policy issues involving crude oil imports hinge on whether crude oil markets are unified or regionalized. Weiner observed that the literature on crude oil markets has paid little attention to the regionalization issue. However, a generalized literature addressing market delineation has been evolving for some time and recent advances in applied time series analysis have produced multivariate testing procedures which avoid most of the problems of the bivariate price correlation analyses previously employed in analyzing regionalization issues. This paper advances the work of Weiner by incorporating cointegration relationships into multivariate time series models and using these models to examine the extent of regionalization in the world market for crude oil imports. The empirical results reported here lend support to Adelman's characterization of the world oil market as "one great pool" (Adelman 1984).

Pages 125-134

Business Cycles and the Behavior of Energy Prices

by Apostolos Serletis and Vaughn Hulleman (University of Calgary)

Abstract
This paper tests the theory of storage—the hypothesis that the marginal convenience yield on inventory falls at a decreasing rate as inventory increases in energy markets (crude oil, heating oil, and unleaded gas markets). We use the Fama and French (1988) indirect test, based on the relative variation in spot and futures prices. The results suggest that the theory holds for the energy markets.

Pages 135-155

Tax Reform and Energy in the Philippines Economy: A General Equilibrium Computation

by Roy G. Boyd, Khosrow Doroodian, and Prapassorn Udomvaech (Ohio University)

Abstract

This paper examines how energy tax cuts, offset with income tax increases, affect production, consumption, and total welfare in the Philippines economy. Our results show that energy tax cuts expand the energy and nonmetal mining sectors, but decrease output in the manufacturing, agricultural, and metal mining sectors. Consumption of all goods and services combined increases as the amount of energy tax reduction increases. Our welfare results, however, are mixed. While the welfare of the mid- and high-income levels increases, that of the lowest income level decreases. These results are robust with respect to changes in the elasticity of substitution in energy production as well as the elasticity of substitution in consumer demand. From the standpoint of economic efficiency, a policy such as this would enhance growth and aggregate income. From an equity standpoint, however, this policy is highly regressive in spite of the fact that the richest households pay proportionately more to finance the energy tax reduction.

Pages 157-184


by Samuel Fankhauser (University College London and University of East Anglia)

Abstract

This paper provides an order-of-magnitude assessment of the marginal social costs of greenhouse gas emissions. The calculations are based on a stochastic greenhouse damage model in which key parameters are random. This allows a closer representation of current scientific understanding and also enables calculation of a damage probability distribution. Thus, we account explicitly for the uncertain
nature of the global warming phenomenon. We estimate social costs of CO\textsubscript{2} emissions in the order of 20 $/tC for emissions between 1991 and 2000, a value which rises over time to about 28 $/tC in 2021-2030. Similar figures for CH\textsubscript{4} and N\textsubscript{2}O are also provided. As a consequence of the prevailing uncertainty, the standard deviation of the estimates is rather high. The distribution is positively skewed, which implies that the currently predominant method of using best guess values will lead to an underestimation of the expected costs of emissions.

Pages 185-211

**Emission Trading with Shares and Coupons: A Laboratory Experiment**

by R. Andrew Muller and Stuart Mestelman (McMaster University)

**Abstract**

Increasing attention is being paid to emission trading programs for the control of air and water pollution. The United States EPA has implemented a tradable emission allowance program for sulphur oxides. The EPA auction has been investigated in the laboratory by Cronshaw and Brown Kruse and by Franciosi, Isaac, Pingry and Reynolds. A somewhat different proposal has been made for controlling nitrous oxides in southern Ontario. Trade would occur in coupons (emission permits) and shares (entitlements to coupons). This paper reports a laboratory investigation of the Canadian proposal in which the experimental design developed by Cronshaw and Brown Kruse was modified to reflect the proposed Canadian institution. The results indicate dispersed but relatively stable prices, higher efficiency than obtained in related experiments modelling the EPA plan, and little arbitrage between share and coupon prices. The results could be due to differences in the market institutions or the training of subjects.

Pages 213-232

** Tradable Cumulative CO\textsubscript{2} Permits and Global Warming Control**

by Richard F. Kosobud (University of Illinois at Chicago), Thomas A. Daly, David W. South (Argonne National Laboratory) and Kevin G. Quinn (St. Norbert College)

**Abstract**

As an alternative to current global warming policy proposals to freeze greenhouse gas "emissions" at their 1990 levels by the year 2000, this study examines the implications of a long-run objective of stabilizing greenhouse gas "concentrations" at low to moderate risk levels by the year 2100. The current proposals to control emissions slow but do not end the build-up of concentrations, and they could imply
costly short-term adjustments of the energy industries. Our objective is to explore an alternative policy that could (1) stabilize induced climate change, (2) provide for the creation of international "property rights" in the stratosphere by means of tradable emission permits, and (3) be more intertemporally cost-effective. Our method for analyzing this effort is a tested, dynamic, price sensitive, global economic model to which is linked a climate change submodel. Together these models enable us to project price and quantity time paths of energy, climate, and tradable permit variables under alternative policy actions.

*received IAEE's best paper award for 1994

Book Reviews

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Adjusting to Volatile Energy Prices
by Philip K. Verleger, Jr (book review by Michael Lynch)

Pages 235-238

Handbook of Natural Resource and Energy Economics, Volume III
by Allen V. Kneese and James L. Sweeney (eds), (book review by Carol Dahl)

Pages 238-240

by M.A. Adelman (book review by Richard Gordon)