

# Winter 2014 Newsletter

# MIT CEEPR

MIT Center for Energy and Environmental Policy Research



MASSACHUSETTS INSTITUTE OF TECHNOLOGY



CEEPR has been the focus at MIT for research activity in energy economics since the Center's founding in the mid-1970s, and in environmental economics since the early 1990s.

CEEPR promotes rigorous and objective empirical research at MIT on issues related to energy and environmental policy in order to support improved decision-making by government and industry. The results of the research are disseminated through publications, workshops, educational programs and

other public outreach activities. Economics research at CEEPR is integrated with engineering and science in collaboration with the MIT Energy Initiative and faculty throughout the Institute. The relevance and validity of CEEPR research is enhanced through cooperation with government and industry Associates in countries around the globe.

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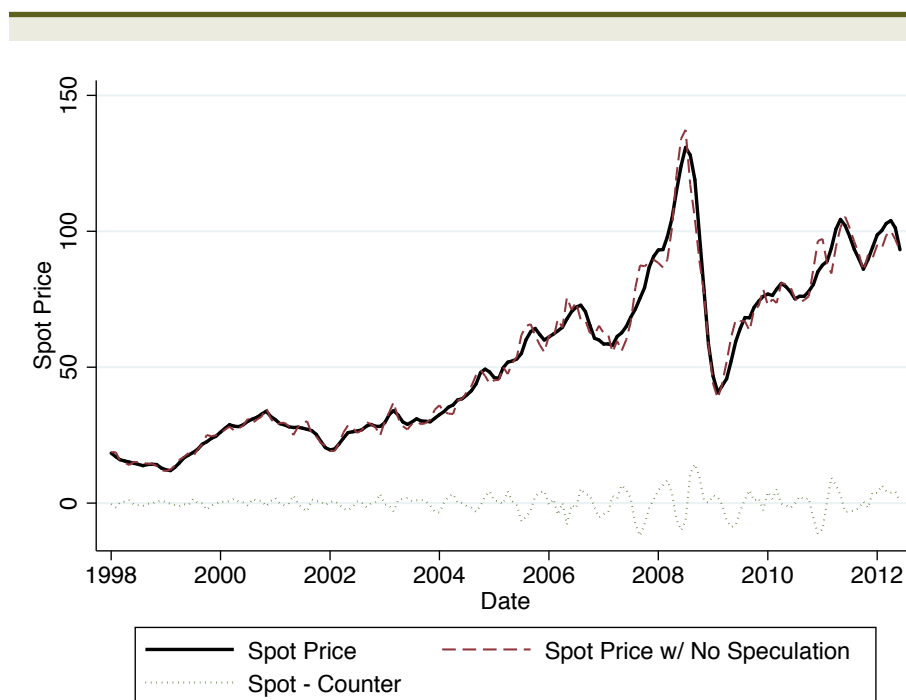
# The Simple Economics of Commodity Price Speculation

*Are oil speculators to blame for the fluctuations in oil price over the last decade?*

The price of crude oil more than tripled from 2004 to 2008, abruptly plummeted, and then shot up again. Many pundits blamed oil speculators for the wild fluctuations in oil prices over the last decade, and some called for a ban on trading oil futures and other energy-based derivatives. But what activities constitute “oil speculation,” and do how these activities actually impact crude oil prices?

To determine if speculation was behind the fluctuating oil prices, or if other forces were at work, CEEPR Director Christopher Knittel and the study’s co-author, Professor Robert Pindyck, created a simple model to simulate changes in oil prices caused by the fundamental market forces of supply and demand. Described in a recent CEEPR Working Paper<sup>1</sup>, the model captures price changes resulting from shifts in oil demand, such as increasing oil use in China and other developing countries, and shifts in supply, such as decreases in production caused by hurricanes.

The researchers also needed to simulate the effects of speculation, but doing this is complicated, as often even economists can’t agree on what counts as speculation. Generally, when people criticize speculation, they are thinking of purchasing oil futures with the intention of selling them for capital gain when the price of oil rises. However, it is difficult if not impossible to distinguish this sort of investment from legitimate investments. Furthermore, a variety of other activities count as speculation: oil companies can speculate on the price of oil by reducing



**Actual prices and implied prices with no speculative activity:  
Using inventory changes and three-month periods.**

production when prices are low; they can hold off on developing new sources of oil; they can store physical supplies of oil until prices are high; and rather than investing in commodities, speculators can buy stock in oil companies, creating artificially high prices.

To solve this problem, researchers used their simple model to simulate the price of oil based only on information about the existing supply and demand for oil. They then compared their calculated prices to the actual prices of crude oil from 1999 to 2012. Any differences between the actual price and the calculated price based on supply and demand should reveal the effect of speculation. They found that, on average, speculation decreased

prices or left them essentially unchanged. For the most part, the actual price of oil closely matched the price dictated by changes in supply and demand. Surprisingly, speculation actually lessened the peak oil price by about 5%. Furthermore, speculation slightly reduced oil price volatility. Thus, the evidence doesn’t support the claim that oil speculators caused the sharp increases in oil price over the last decade. Instead, these increases were caused by shifts in supply and demand. ■

<sup>1</sup> Knittel, C.R. and R.S. Pindyck, 2013: The Simple Economics of Commodity Price Speculation. *CEEPR Working Paper 2013-006*, May, 49 pp.

# Did “Cash for Clunkers” Deliver?

## *The consumer effects of the car allowance rebate system*

From July 24, 2009 to August 24, 2009 consumers who traded in their used vehicles for ones with substantially higher fuel economy qualified for a government credit of either \$3,500 or \$4,500 as part of the “Cash for Clunkers” program. Policymakers said the program would stimulate the economy by helping struggling automakers, improve the environment through the resulting decrease in emissions, and help everyday consumers by putting money back in their pockets. But did consumers actually benefit from Cash for Clunkers?

CEEPR researchers analyzed the direct effects of Cash for Clunkers on consumers in a working paper released in January, 2014.<sup>1</sup> Using data on new car transactions for 20% of US new car dealerships, data from the National Highway Transportation and Safety Administration (NHTSA), fuel economy data from the EPA, and gasoline price data from the Energy Information Administration (EIA), researchers analyzed new car purchases before, during, and after Cash for Clunkers went into effect.

The first question researchers investigated was whether the full government credit passed through to consumers. When consumers buy vehicles they negotiate the final price with the dealership; whether or not consumers received the full credit from the Cash for Clunkers program depends on the outcome of the negotiations with the dealer. In other words, did consumers accept higher sale prices than they would have otherwise because of the government credit? Researchers found that this was not the case, and that dealers passed 100% of the rebate through to consumers. This is an even higher pass-through rate than manufacturer rebates, which had a pass-through rate of approximately 80%.

Second, researchers looked at whether the government credit crowded out manufacturer incentives. Auto manufacturers often offer their own rebates to encourage sales of specific vehicles. Researchers wondered whether the government credits might lead manufacturers to reduce their own rebates. To the contrary, during the Cash

for Clunkers program, more vehicles sold with a manufacturer rebate and the average rebate was higher than either before the program started or after it ended. As Cash for Clunkers created an incentive for consumers to purchase fuel-efficient vehicles, manufacturers offered rebates to convince consumers to buy their fuel-efficient vehicles rather than a competitor’s.

Third, researchers wanted to know if scrapping a large number of used vehicles as called for in the program would affect prices in the used vehicle market. The law required auto dealerships to send the traded-in vehicles to a designated facility to be scrapped. In all, about 700,000 used vehicles were scrapped and sold for parts, potentially creating a shortage that could increase prices in the used-car market. Researchers found no evidence of this occurring. Prices of used cars similar to those traded in as part of Cash for Clunkers did not increase as a result of the program. Researchers suspect that consumers traded in cars as part of Cash for Clunkers that they would have otherwise held on to for some time. Thus, the trade-in requirement had little effect on prices in the used car market.

Ultimately, Cash for Clunkers was good news for consumers’ pocketbooks. CEEPR analysis shows Cash for Clunkers was consistently positive for consumers, delivering on policymakers’ goals to directly help consumers. ■



<sup>1</sup> Busse, M.R., C.R. Knittel, J. Silva-Risso, and F. Zettelmeyer, 2013: Did “Cash for Clunkers” Deliver? The Consumer Effects of the Car Allowance Rebate System. *CEEPR Working Paper 2013-009*, November, 31 pp.



# Truth-telling by Third-party Auditors

## *Are current auditing practices producing reliable data?*

In conventional auditing markets, a third-party entity is usually chosen to monitor the compliance of firms with regulation. This is the norm in financial accounting, and many consumer and commodity markets. Third-party auditors monitor standards for food safety, healthcare, and durable goods and are also used by several countries to verify compliance with laws and regulations regarding environmental standards, both nationally and internationally.

A common, yet problematic characteristic of these auditing practices is that the auditor is generally chosen by, paid by, and reports to the audited firm. This creates a potential conflict of interest between truth-telling and reporting results that are beneficial to the client. The auditors in these situations have incentives to shade or falsify reports to maintain a business relationship, which ultimately undermines regulation. The recent financial crisis suggests this may be a real and serious concern.

Recently, a two-year field experiment was completed and raised some eye-opening findings. Collaborating with the environmental regulatory body in Gujarat, India and Harvard University, CEEPR researchers Esther Duflo, Michael Greenstone, Rohini Pande and Nicholas Ryan, evaluated 473 industrial plants and their related auditors. Roughly half of the plants were kept in a control group using standard auditing practices, and half of the plants tried a new arrangement. Instead of the auditors being hired by the evaluated companies, the Gujarat

Pollution Control Board randomly assigned auditors to these plants, paid the auditors fixed fees from a common pool of funds, 20% of the audits were randomly selected for re-examination, and finally auditors were paid incentive bonuses for accurate reports.

After analyzing all of the data, the researchers found that the status quo group reporting was corrupted, with auditors systematically reporting pollution readings just below the regulatory standard. Almost 75% of these traditional audits reported particulate-matter emissions just below the legal limit. However, looking at the 233 plants under the new method, it was found that only 19% of the plants reported emissions just below the legal limit. Also, across several different air and water pollution measures, inaccurate reports of plants complying with the regulatory laws dropped by about 80%.

Using the results of this project, the Indian state used the data to better enforce its pollution laws and within 6 months air and water pollution from the plants using the new auditing method were significantly lower than at plants using the traditional auditing practices.

The implications of this study, which can be reviewed further in CEEPR Working Paper 2013-014, may be able to be applied to a broader scope and other auditing markets. Standard corporate financial reports and the global credit rating system also are areas where the auditors have skewed auditing incentives. "It would be a



Professor Greenstone on a site visit of a hazardous waste storage facility. Photo: Len Rubenstein

mistake to assume that quarterly financial reports for public companies in the US are exactly the same as pollution reports in Gujarat, India," Greenstone acknowledges. "But one thing I do know is that these markets were all set up with an obvious fundamental flaw—they all have the feature that the auditors are paid by the firms who have a stake in the outcome of the audit... No one has really had the political will to do something about this. Now we have some evidence." ■

Duflo, E., M. Greenstone, R. Pande and N. Ryan, 2013: Truth-telling by Third-party Auditors and the Response of Polluting Firms: Experimental Evidence from India. *CEEPR Working Paper 2013-014*, May, 53 pp.

## What do the Models tell us?

Professor Robert Pindyck has a new working paper (CEEPR-WP-2013-007) that has attracted a good share of attention since it steps into the highly charged debate on the reliability of research related to climate change. But in this case, the focus is on what we learn from one class of economic model, the so-called integrated assessment models (IAM). These models have been used to arrive at a “social cost of carbon” (SCC). For example, in 2010 a US Government Interagency Working Group recommended a \$21/t CO<sub>2</sub> as the social cost of carbon to be employed by US agencies in conducting cost-benefit analyses of proposed rules and regulations. This figure was recently updated to \$33/t CO<sub>2</sub>.

Professor Pindyck’s paper calls attention to the wide, wide range of uncertainty surrounding key inputs to IAM models, and to the paucity of reliable empirical data for narrowing the reasonable range of input choices. The paper then suggests profitable directions for reorienting future research and analysis.

Reflecting the highly charged nature of the US political debate on climate change, Professor Pindyck’s paper has been seized on by opponents of action. In particular, certain blogs have cited his paper in support of their campaign against any action. Interestingly, Professor Pindyck is an advocate of action on climate change, such as leveling a carbon tax. So his own view

of the implications of his research are quite different than that of those who oppose any action.

An alternative approach is to think about Professor Pindyck’s review as a guide for future research on the costs of climate change which is better focused to address the important uncertainties in a way that can better contribute to public discussion and analysis.

Pindyck, R., 2013: Climate Change Policy: What do the Models Tell Us? *CEEPR Working Paper 2013-007*, July, 21 pp.

## Dr. John Parsons joins the Global Markets Advisory Committee of the CFTC

CEEPR’s Executive Director, Dr. John Parsons, was recently appointed to the Global Markets Advisory Committee of the Commodities Futures Trading Commission (CFTC). The CFTC is the US government agency responsible for supervising most derivatives trading in the US, including the energy and agriculture commodity derivatives markets. The committee provides input to the Commission on the interaction of regulations with the global nature of business and the derivatives marketplace. Members of the committee come from the various derivative exchanges and clearinghouses, dealers, brokers and other intermediaries, and end-users as well as public policy advocacy organizations. Over the last number of years, Dr. Parsons has been actively engaged in discussions about how derivatives reform impacts commercial end-users, including presentations at CEEPR Workshops and CEEPR publications.



## Notable Changes

Over the past few months, some notable changes to CEEPR's administration were made. Professor of Economics and Management and CEEPR Co-Director **Richard Schmalensee** stepped down from his role. In his stead, Professor **Christopher Knittel** has taken on the full position of CEEPR Director.

**John Parsons** has stepped down as CEEPR Executive Director to take a position at the MIT Sloan School of Management as Head of the MBA Finance Track.

**Loren Cox** retired at the end of 2013, but continues to maintain ties with CEEPR and will be involved

with the center in 2014. **Joshua Hodge** has come onboard as the new Deputy Executive Director for Resource Development for both CEEPR and the MIT Joint Program. Joshua has extensive experience in the energy sector, previously running the Commodities Research and Forecast business, Americas at Thomson Reuters, and as Managing Director, North America at Point Carbon.

In addition **Joni Bubluski**, longtime CEEPR Program Administrator, has retired. The center has promoted **Tony Tran**, previously a part of the Joint Program, to this role.

Finally, CEEPR is happy to announce the addition of **Michael Mehling** to CEEPR's management team as Executive Director. Michael brings over a decade of experience working on energy and environmental policy with government agencies, private companies and civil society organizations in North America, Europe, and the developing world. Most recently, he was President of the Ecologic Institute in Washington DC, a think tank with partner offices in Berlin and Brussels. Michael's work has focused on policy instruments at the nexus of energy and the environment, especially pricing and emissions trading.

## PUBLICATIONS

### Recent Working Papers

#### WP-2013-015

**Melting-pots and Salad Bowls: The Current Debate on Electricity Market Design for RES Integration**

Jean-Michel Glachant and Arthur Henriot, November 2013

#### WP-2013-014

**Truth-telling by Third-party Auditors and the Response of Polluting Firms: Experimental Evidence from India**

Esther Duflo, Michael Greenstone, Rohini Pande, and Nicholas Ryan, May 2013

#### WP-2013-013

**Mapping and Measuring the Channels of Oil Price Exposure in the Economy and the Role of Oil Derivatives in Reshaping Them**

John E. Parsons, October 2013

#### WP-2013-012

**The Performance of US Wind and Solar Generating Plants**

Richard Schmalensee, September 2013

#### WP-2013-011

**The Welfare Impact of Indirect Pigouvian Taxation: Evidence from Transportation**

Christopher R. Knittel and Ryan Sandler, February 2013

#### WP-2013-W10

**The Origin of US Transportation Policy: Was There Ever Support for Gasoline Taxes?**

Christopher R. Knittel, January 2013

#### WP-2013-009

**Did "Cash for Clunkers" Deliver? The Effects of the Car Allowance Rebate System**

Meghan R. Busse, Christopher R. Knittel, Jorge Silva-Risso, and Florian Zettelmeyer, November 2012

#### WP-2013-008

**Who is Exposed to Gas Prices? How Gasoline Prices Affect Automobile Manufacturers and Dealerships**

Meghan R. Busse, Christopher R. Knittel, and Florian Zettelmeyer, November 2012

#### WP-2013-007

**Climate Change Policy: What do the Models Tell Us?**

Robert S. Pindyck, July 2013

#### WP-2013-006

**The Simple Economics of Commodity Price Speculation**

Christopher R. Knittel and Robert S. Pindyck, April 2013

All listed publications and referenced working papers in this newsletter are available on our website at [ceepr.mit.edu/working-papers](http://ceepr.mit.edu/working-papers)





A session during the recent CEEPR European Electricity Workshop held in September 2013 in Berlin, Germany.