How Wall Street Speculation is Driving Up Gasoline Prices Today

Robert Pollin and James Heintz

Political Economy Research Institute
University of Massachusetts, Amherst

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RESEARCH BRIEF

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The average retail price of gasoline at the pump, excluding taxes, was $3.96 in May. In January 2009, the average retail price was $1.96 (expressed in May 2011 dollars). In other words, consumers are now paying twice as much to fill their cars as they did 2½ years ago. Even as recently as last October, the average gas price at the pump was $2.93. The average gas price has thus risen by a full dollar—35 percent—in only seven months.

What explains this huge run up in gas prices for consumers? To a significant extent, this is the result of the economy moving out of a deep recession, into a recovery, which has increased the demand for gasoline. But a major additional factor is the rapid growth in large-scale speculative trading around oil prices through the oil commodities futures market.

Indeed, we estimate that, without the influence of large-scale speculative trading on oil in the commodities futures market, the average price of gasoline at the pump in May would have been $3.13 rather than $3.96. This means that the average U.S. consumer paid a 83-cent-per-gallon premium in May for their gasoline purchases due to the huge rise in the speculative futures market for oil. Considering the U.S. economy as a whole, this translates into a speculation premium of over $1 billion for May alone. If the May price were to hold for a year, that would mean that the speculative premium would total $12 billion.

Each [average two-car] family spent $82 more in May than necessary for gasoline, and most of this $82 will have made its way into the pockets of large-scale speculators.

For the average U.S. auto owner, the speculative premium amounted to about $41 in May. This means the speculative premium for the average two-car family was about $82 in May. That is, each such family spent $82 more in May than necessary for gasoline, and most of this $82 will have made its way into the pockets of large-scale speculators in the oil commodities futures market. (We present details on our data sources, statistical methods, calculations, as well as references to the relevant professional literature in the Appendix to this document).

Predicting the ups and downs of prices in global oil markets is notoriously unreliable. We have not attempted to create a new forecasting model. Rather, our estimate of where the retail price of gasoline would have been in May absent the

influence of speculation is based on a straightforward exercise. We simply observed the actual long-run trend in oil prices using a standard statistical technique (the Hodrick-Prescott filter) and checked the reliability of our trend estimate by comparing it with the figure produced by the U.S. Energy Information Agency. By definition, this long-run trend figure will automatically take account of all the long-term factors influencing global oil prices, including 1) the production of oil; 2) refining, transportation and marketing conditions; and 3) changes in global demand. That is, the long-run price trend automatically incorporates all of the factors affecting oil prices other than short-term speculation.

Indeed, our method does also take account of increases in the speculative trading of oil, but only the long-run expansion of the speculative market, not the market's short-term ups and downs. That is the main reason why our estimate of the speculative premium today is significantly smaller than that of Exxon-Mobil CEO Rex Tillerson. Tillerson testified before the Senate on May 12 that, absent speculative market effects, the global price of crude oil today would be between $60-$70 dollars a barrel. This would translate into a price of gasoline at the pump of between $2.56 and $2.77 (assuming that these crude oil prices would have held steady at this lower level over the past several months). According to Tillerson's informal estimate, the speculative premium for May would therefore be between $1.19 and $1.41 a gallon.

It is not likely that any two observers will agree on the exact size of the speculative premium in oil markets today. But there is no doubt that big-time traders are receiving windfalls. For example, in mid-June, Glencore, the world's largest commodity trader reported a 47 percent surge in profits, driven, as reported in the *Financial Times* "by stellar results in oil trading" (*FT,* June 14, 2011).

HOW SPECULATION AFFECTS RETAIL GAS PRICES

The overall level of futures market trading of crude oil contracts on the New York Mercantile Exchange is currently 400 percent greater than it was in 2001, and 60 percent higher than it was only two years ago.

In the commodities futures market, buyers and sellers of futures contracts make agreements for the delivery of energy commodities such as crude oil at an agreed upon fixed price and date. These markets have been operating for decades. The contracts are regularly used by large purchasers of oil and other energy commodities, such as commercial airlines, to reduce their business risks against the possibility of large fluctuations in energy prices in the future. As such, the energy futures markets effectively supply insurance policies for large-scale consumers of energy products.

While the market for energy futures contracts is not new, what is new is that the amount of trading of crude oil futures contracts has exploded over the past decade. For example, the overall level of futures market trading of crude oil contracts on the New York Mercantile Exchange is currently 400 percent greater than it was in 2001, and 60 percent higher than it was only two years ago. Measured relative to the increases in the physical production of global oil supplies, trading

is still 300 percent greater today than it was in 2001, and 33 percent greater than only 2 years ago.

The reason the crude oil futures market has exploded is that a new type of trader has come to dominate the futures market. These traders entered the market with enormous financial resources, enabling them to influence the ups and downs of market prices to an unprecedented degree. To a large extent, these traders are affiliated with major investment banks, such as Goldman Sachs or UBS. They became involved in this market to buy energy futures contracts as an alternative to holding stocks, bonds, or other types of derivative assets, such as mortgage-backed securities. But when these traders came to hold dominant positions in the market, they also gained the power to move prices up or down through their own trading decisions. Among other strategies, they can make large profits by staying ahead of other market participants. For example, when market prices are rising, they can buy large numbers of futures contracts, aiming to push prices up further upward, then sell their contracts at market peaks.

This type of speculative activity on the crude oil futures market influences the prices today (spot prices) of both crude oil and gasoline at the pump by affecting expectations of future price changes. That is, traders in the market for current supplies (the spot market) look to the speculative futures market to determine where to set prices today.

ARE OTHER FACTORS AT PLAY?

Middle East instability causing falling crude oil production?

The level of production over the past three months is three percent higher than in January 2009, when the average retail price was $1.90 per gallon.

Some commentators argue that the rising price of gasoline is due to reductions in crude oil production tied to the recent political instability in the Middle East. In fact, there has been no significant change at all in global crude oil production since the uprisings that began in Tunisia last December, and spread into Egypt, Libya, Bahrain, Yemen and Syria. Thus, total global crude oil production averaged 87.6 million barrels per day over September – December of 2010, and 87.9 million barrels for January – March 2011. Moreover, the level of production over the past three months is three percent higher than in January 2009, when the average retail price was $1.90 per gallon.

Rise in global oil demand?

It has also been argued that gasoline price increases are tied to a sharp rise in the global demand for oil, due especially to the rapid economic growth being experienced in China and India. However, the global demand for crude oil has been rising for three decades within a range in most years of about 1 – 2 percent per year. These demand increases have also been closely correlated with the increase in global production. Considering recent figures, from the first three months of 2009 relative to the first three months of 2011, global demand rose by about 2.4

percent annually while global production rose by 2.5 percent. Just since October 2010, when the price of gasoline began rising sharply, the global demand for oil followed the same pattern that has held since early 2009, i.e. demand for oil continued to rise somewhat more slowly than new oil production.

Reaching limits of global oil supply?

As of the most recent 2009 data, the proven reserves of oil globally were equal to over 43 years of global oil consumption at current consumption levels. This figure for 2009 is the highest level this ratio has reached over the past 30 years. In 1980, there were only 28 years worth of proven oil reserves relative to the global consumption level that year. In 2000, there were 36 years of proven reserves relative to consumption levels at that time. In short, there is no evidence to suggest that the current short-term jump in oil prices could be tied to long-term shortages in oil supply.

OIL PRICES AND ENVIRONMENTAL PROTECTION

Funds that are generated by higher fossil fuel prices will need to be captured for purposes that are environmentally and socially beneficial, rather than simply to increase profits for oil companies and large-scale futures market traders.

The U.S. and rest of the world today face the huge challenge of controlling global climate change. This calls for both immediate and long-term policy measures to dramatically reduce the consumption of fossil fuels, including gasoline, since the single greatest factor causing global climate change is carbon emissions released into the atmosphere by burning fossil fuels. These policy measures include dramatically increased levels of investment to improve energy efficiency in buildings and industry, as well with automobile and public transportation systems. It also entails making renewable energy sources such as wind and solar power affordable and widely accessible. Such investments should then become a major new engine of economic growth and job creation over the next generation. In this context of an epoch-defining clean-energy transformation, the prices of oil and coal will have to rise to accurately reflect the environmental damages of burning oil, coal and other fossil fuels. But any such increases in fossil fuel prices will need to be managed carefully through public policy, not emerge as a byproduct of excessive speculation on futures markets. Moreover, the funds that are generated by higher fossil fuel prices will have to be captured for purposes that are environmentally and socially beneficial, rather than simply to increase profits for oil companies and large-scale futures market traders. These purposes would include helping to finance investments in energy efficiency and renewable energy sources. They would also include direct financial support to consumers, so that the living standards of ordinary households are not hurt by any increases in fossil fuel prices.

THE FEDERAL GOVERNMENT CAN CONTROL SPECULATION

President Barack Obama signed into law the Dodd-Frank Wall Street Reform and Consumer Protection Act in July 2010. Dodd-Frank is the most ambitious measure aimed at regulating U.S. financial markets since the Glass-Steagall Act

Provisions of Dodd-Frank grant the federal government the authority to impose meaningful control of speculation on the commodities futures market.

was implemented in the midst of the 1930s Depression. Provisions of Dodd-Frank grant the federal government the authority to impose meaningful control of speculation on the commodities futures market. In particular, Section 737 of the Dodd Frank Act instructs the Commodity Futures Trading Commission (CFTC) to institute position limits – or limits on holdings of futures contracts by traders – in order to "diminish, eliminate, or prevent excessive speculation." This broad grant of authority empowers the CFTC to immediately address the increase in speculation in all commodities markets today, including the oil futures market.

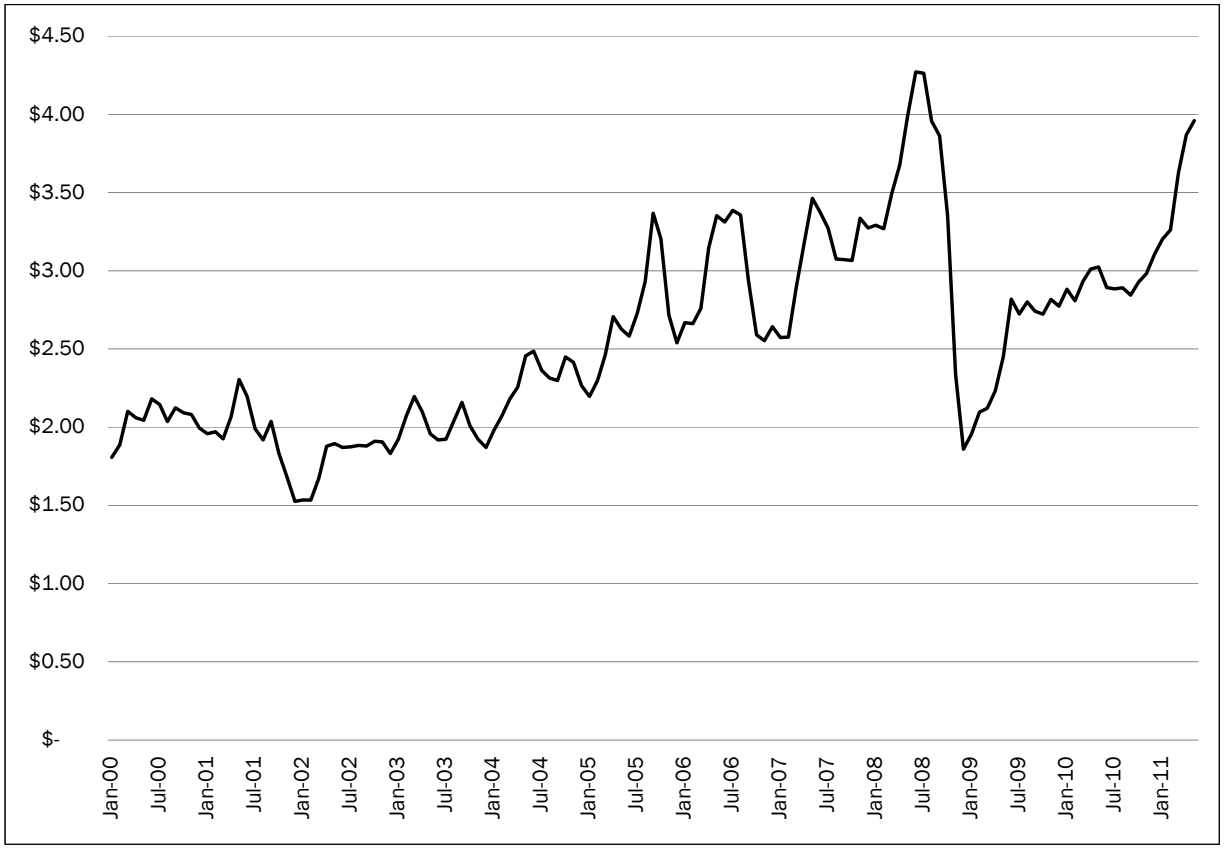
At present, regulations on speculation in oil futures markets in the United States are set by the New York Mercantile Exchange. This is a private agency representing the interests of private market traders. What is needed now is for the CFTC to set limits in this market which are focused on the public interest, namely to "diminish, eliminate, or prevent excessive speculation." In short, the CFTC needs to exercise its authority to ensure that the policy tools provided by Dodd-Frank are implemented in ways that protect the interests of ordinary people and small businesses throughout the United States.

Appendix

1. DATA ON AVERAGE RETAIL GASOLINE PRICES AT THE PUMP (EXCLUDING TAXES)

Figure 1. Retail gasoline prices at the pump excluding taxes, 2000 - 2011

$ PER GALLON, U.S. CITY AVERAGE, MAY 2011 DOLLARS

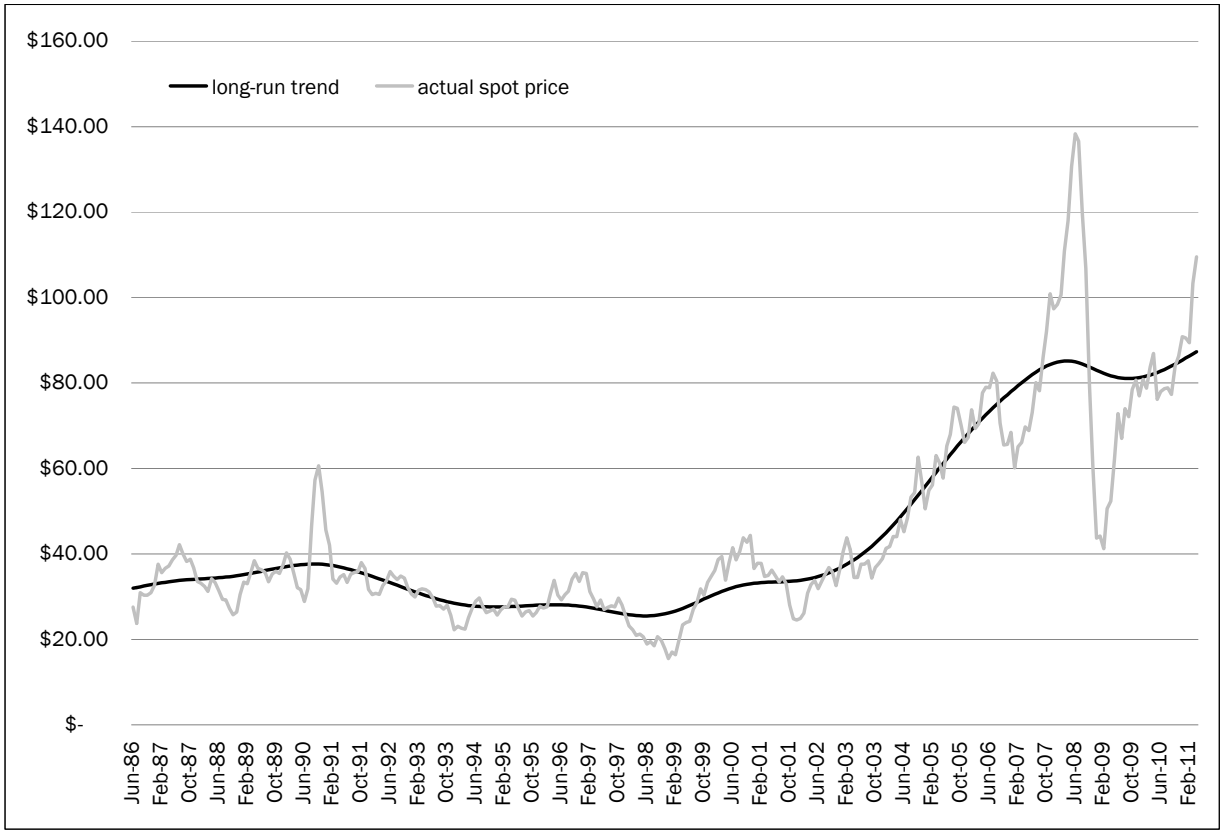


Source: Energy Information Administration, U.S. Department of Energy.

2. TWO ESTIMATES OF LONG-TERM CRUDE OIL PRICES

Figure 2a. Crude oil prices, long-run trends, June 1986 - May 2011

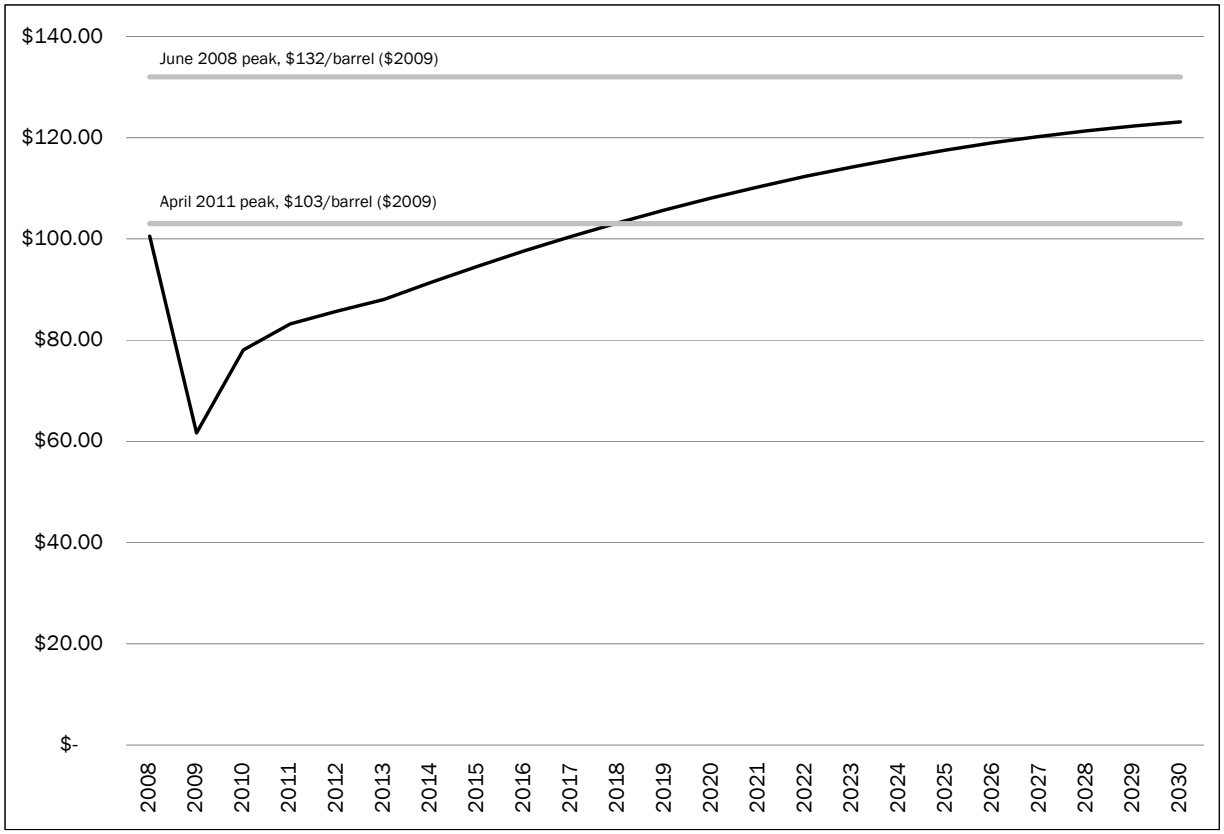
SPOT PRICES, DOLLARS PER BARREL, JUNE 1986-MAY 2011 WEST TEXAS INTERMEDIATE, MAY 2011



Source: Energy Information Administration, U.S. Department of Energy.
Note: Long-run trend estimated by applying a Hodrick-Prescott filter to the actual spot prices

Figure 2b. U.S. Department of Energy Projection of Future Crude Oil Prices

$/BARREL, ('LIGHT-SWEET'/LOW-SULFUR), 2009 DOLLARS



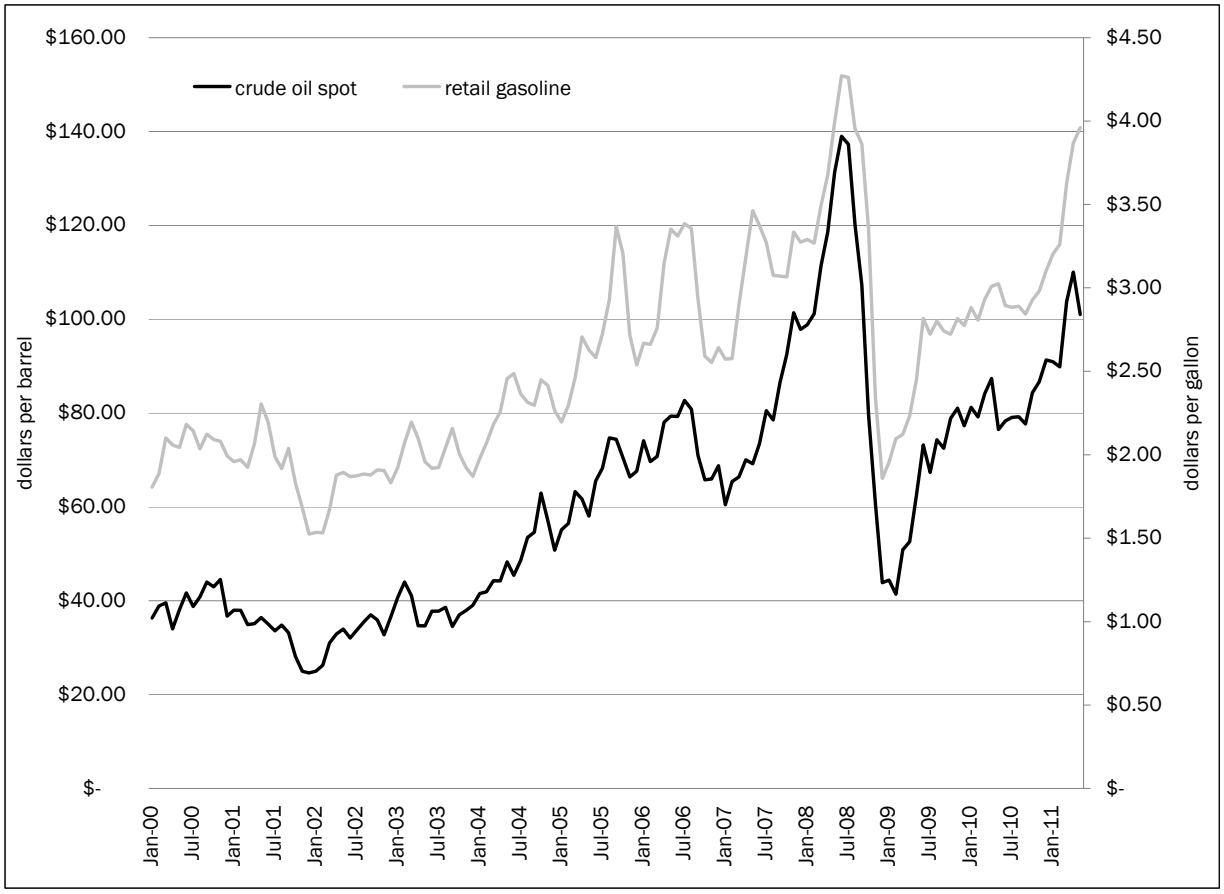
Source: Annual Energy Outlook, U.S. Department of Energy

3. TRANSLATING GLOBAL CRUDE OIL PRICE ESTIMATES INTO RETAIL GASOLINE PRICE ESTIMATES FOR US MARKET.

A. Retail gasoline prices and crude oil prices in spot markets are closely correlated, as shown in Figure 3 below.

Figure 3. Prices of retail gasoline and spot prices of crude oil, 2000-2011

MAY 2011 DOLLARS



Source: Energy Information Administration, U.S. Department of Energy.

B. Over the range of recent prices (June 1986 to May 2011), we estimate the relationship between current retail gasoline prices, current crude oil prices, and lagged values of both retail gasoline and crude oil prices, all adjusted for inflation.

To derive this relationship between crude oil spot prices and retail gasoline prices, we estimate the following equation:

$$lnG_t = \alpha + \beta_1 G_{t-1} + \beta_2 G_{t-2} + \beta_3 G_{t-3} + \gamma_1 C_t + \gamma_2 C_{t-1} + \gamma_3 C_{t-2} + \varepsilon_t$$

in which G_t represents the monthly retail price of gasoline (May 2011 dollars per gallon) at time period 't,' C_t represents the monthly spot price of crude oil (May 2011 dollars per barrel) at time period 't,' and ε is a stochastic error term. All variables are expressed as natural logarithms. Estimated coefficients are:

$$\ln G_t = -0.28 + 1.16 G_{t-1} - 0.54 G_{t-2} + 0.12 G_{t-3} + 0.28 C_t - 0.08 C_{t-1} - 0.07 C_{t-2}$$
$$(6.64)\quad (20.0)\quad (6.86)\quad (2.79)\quad (11.4)\quad (1.79)\quad (2.42)$$

with absolute values of t-statistics shown in parentheses. Unit root tests (augmented Dickey-Fuller) on the two price variables show that both possess unit roots and are integrated of order one. However, unit root tests show that the residual is stationary, indicating a long-run cointegrating relationship between crude oil prices and retail gasoline prices (i.e. they move closely together and one price can be used to predict the other).

Lagged values of both gasoline prices and crude oil prices can affect current gas prices. This implies that past speculative pressures are carried over, at least for several months, to current prices. To estimate what the current gasoline prices would have been if there were no speculation, we need to find a starting point at which actual crude oil prices were roughly equal to the long run trend. Using the data from Figure 2a, we select September 2010 through November 2010 as the most recent months during which actual market prices and the long trend in prices were approximately equal - i.e. there is no evidence of a speculative premium during these months. We then use the above equation, the retail prices of gasoline for September to November 2010, and the estimated long-run trend in crude oil prices (Figure 2a) to predict what retail gas prices would have been without speculation in crude oil markets. Table 1 summarizes these results.

Table 1. Actual and estimated prices of crude oil and gasoline (May 2011 dollars).

	Crude oil ($/barrel)		Gasoline ($/gallon)	
	Actual	Long-run	Actual	No speculation
December 2011	$ 91.30	$ 86.76	$ 3.10	$ 3.02
January 2011	$ 90.96	$ 87.34	$ 3.20	$ 3.06
February 2011	$ 89.87	$ 87.94	$ 3.26	$ 3.08
March 2011	$ 103.79	$ 88.53	$ 3.63	$ 3.10
April 2011	$ 110.06	$ 89.14	$ 3.87	$ 3.12
May 2011	$ 101.00	$ 89.74	$ 3.96	$ 3.13

C. The actual market price in May 2011 was $3.96. The retail price without the speculative premium is estimated to be $3.13, putting the speculative premium at $0.83 per gallon.

4. GROWTH OF CRUDE OIL FUTURES MARKET TRADING

A good measure of the overall investment activity in futures markets is the level of "open interest." This is the total number of outstanding contracts in the futures markets at a given time.

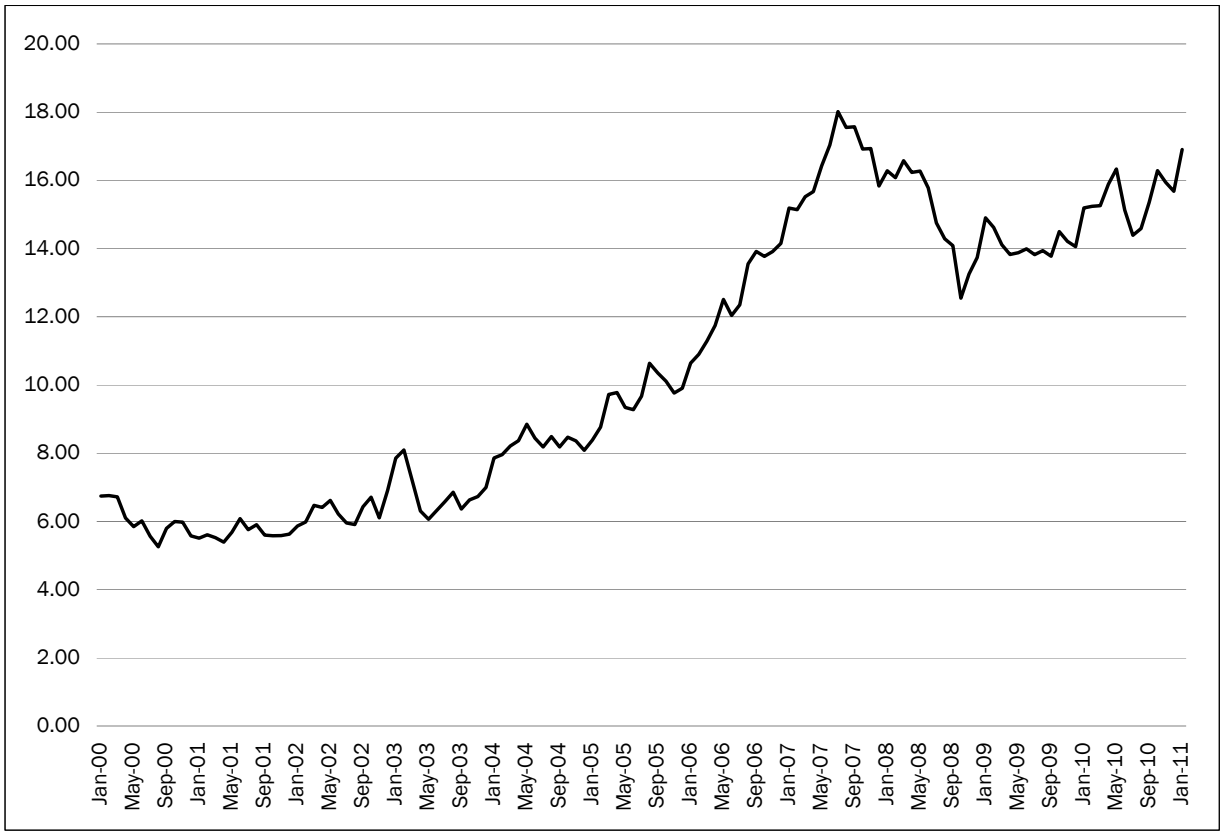
Figure 4a. Open Interest (liquidity), 2000-2011

NYMEX CRUDE OIL ('LIGHT SWEET') FUTURES

Source: Commodity Futures Trading Commission (Commitments of Traders).

Figure 4b. Ratio of Open Interest Crude Oil Futures to Global Oil Production, 2000-2011

NYMEX (RATIO OF THOUSANDS OF CONTRACTS TO MILLION OF BARRELS PER DAY)



Source: Energy Information Administration, U.S. Department of Energy and Commodity Futures Trading Commission (Commitment of Traders).

5. RELATIONSHIP BETWEEN FUTURES MARKET TRADING AND SPOT PRICES

Several studies have found evidence of speculative bubble dynamics in global petroleum markets prior to the financial crisis which unfolded in 2008.[1] Other studies have documented that price changes in crude oil futures markets, including speculative price dynamics, are transmitted to key spot markets.[2] Therefore, there is significant evidence that price bubbles existed in crude oil markets and that speculative dynamics in futures markets would have affected spot prices.

As discussed in the main text, large financial investors entered commodity futures markets in recent years as a way of diversifying their investment portfolios. Data collected by the Commodities Futures Trading Commission (CFTC) has not been sufficiently detailed to track these investments over a long period of

[1] For a review of the recent literature, see Singleton, Kenneth J. 2010, "The 2008 Boom/Bust in Oil Prices," Graduate School of Business, Stanford University. Examples of specific empirical studies that document bubble dynamics in the oil market include: Phillips, Peter C.B. and Yu, Jun. 2010, "Dating the timeline of financial bubbles during the subprime crisis," Cowles Foundation Discussion Paper No. 1770, Yale University, New Haven; and Cifarelli, Giulio and Paladino, Giovanna 2008, "Oil price dynamics and speculation: a multivariate financial approach," *Energy Economics* 32(2): 363-72. A valuable recent press commentary is Ed Wallace's "Blame Washington for High Fuel Prices," *Bloomberg/Business Week*, June 7, 2011. Wallace's story begins with the observation that "It's no secret that speculators are the real reason behind high gas prices. The surprise is that Washington is making no effort to stop them."

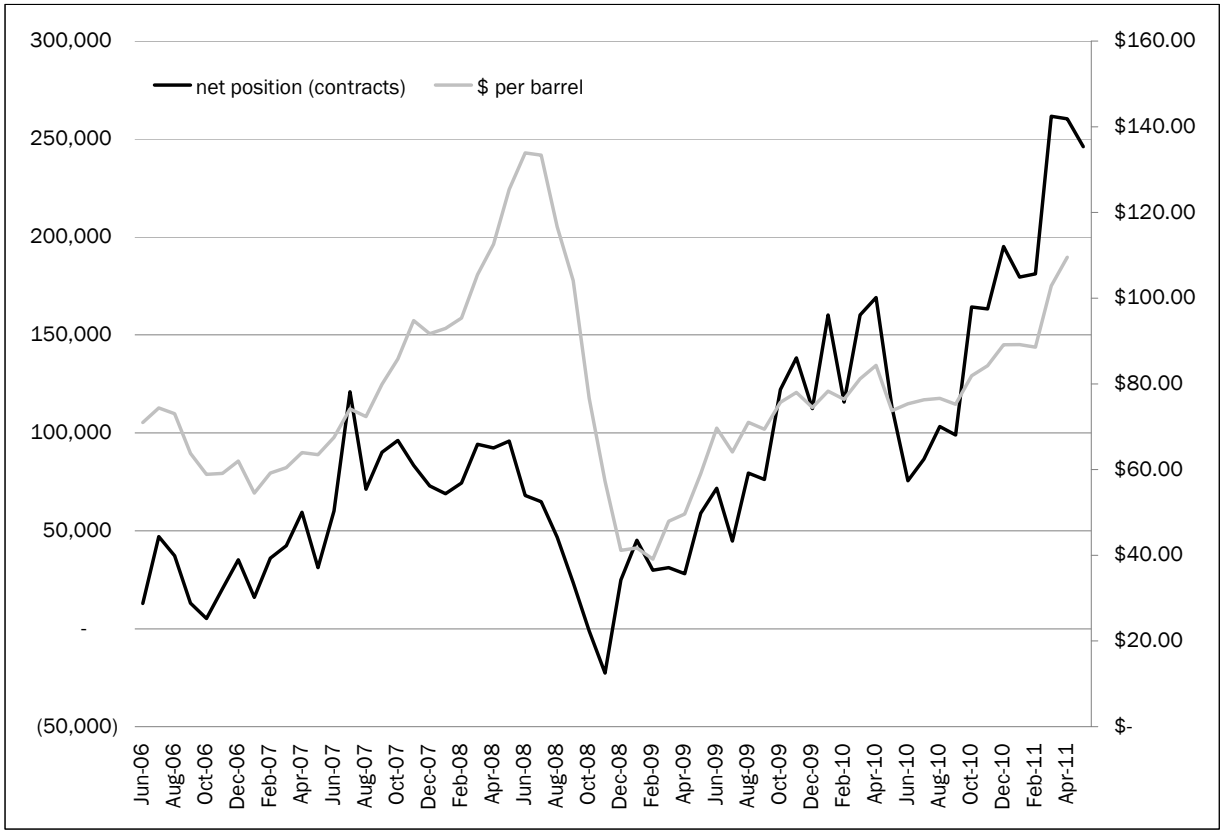
[2] For example, Kaufmann, Robert K. and Ullman, Ben. Oil prices, speculation and fundamentals: interpreting causal relations among spot and future prices. *Energy Economics*, 31: 550-558.

time. However, beginning in 2006, the CFTC began to release data on the investment positions of new categories of investors. These new data allow us to track potentially speculative investments in greater detail (the new database is called the "Detailed Commitment of Traders"). One class of investor, with a potentially significant impact on energy futures markets, is the "managed money traders." Managed money traders represent investors who directly invest in futures markets on behalf of clients and include commodity pool operators, commodity trade advisors, hedge funds, and other institutional investors. Often these investors adopt net long positions in the market and will benefit if commodity prices increase in the future. The net long positions of these traders is strongly correlated with spot prices in crude oil markets.

Figure 5 shows that the movements of spot prices of crude oil and the size of the positions held by large-scale traders is closely correlated. This is especially true since December 2008.

Figure 5. Spot price of crude oil and net long position of managed money traders, 2006-2011

NYMEX LIGHT SWEET CRUDE



Source: Energy Information Administration, U.S. Department of Energy and Commodity Futures Trading Commission (Detailed Commitment of Traders).

6. RECENT SUPPLY AND DEMAND CONDITIONS IN GLOBAL CRUDE OIL MARKET

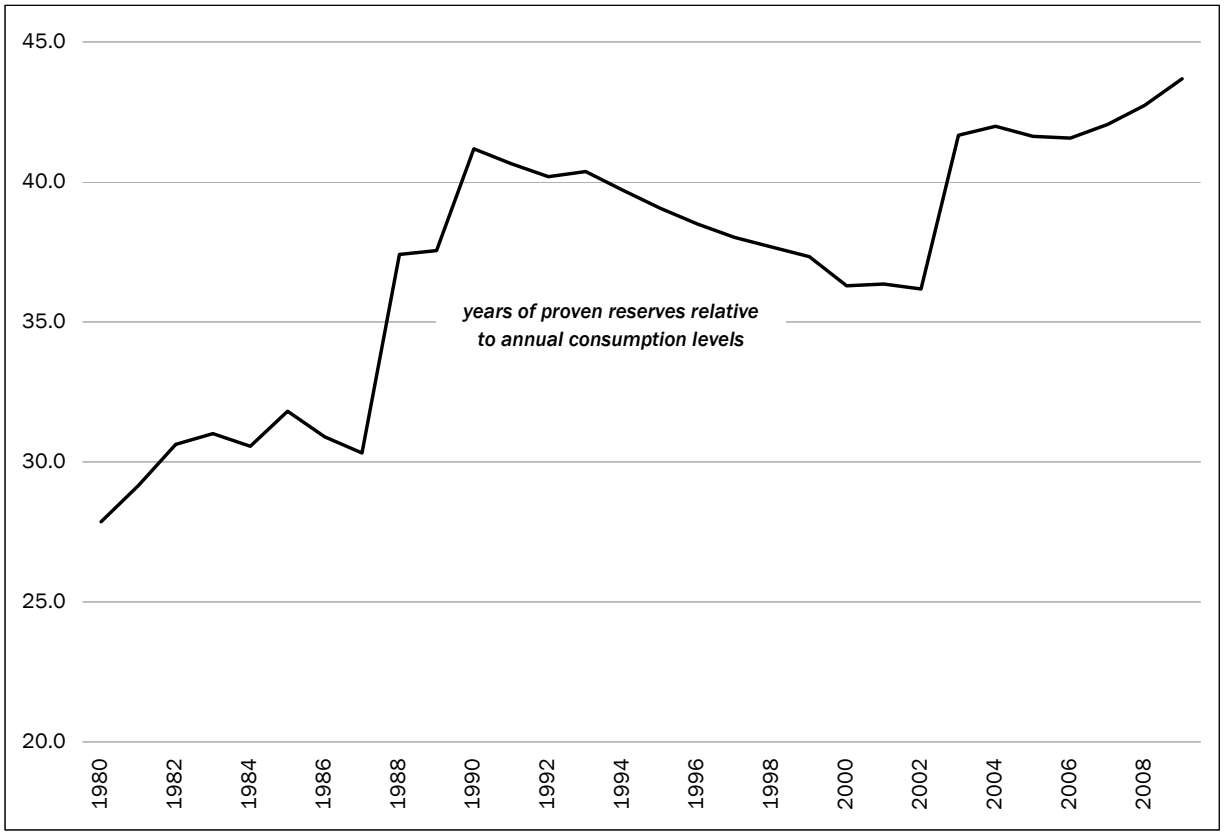
Table 2. Recent changes in global demand and supply of crude oil, 2009-2011

		Demand (million barrels/day)	Production (million barrels/day)	Demand growth less production growth	Spot price (NYMEX)	Change in spot price
2009	1st quarter	83.61	83.59		$ 45.14	
	2nd quarter	84.01	83.72	1.3%	$ 62.20	$ 17.06
	3rd quarter	84.54	84.78	-2.6%	$ 70.75	$ 8.55
	4th quarter	85.16	85.44	-0.2%	$ 78.39	$ 7.64
2010	1st quarter	85.38	86.00	-1.6%	$ 80.79	$ 2.40
	2nd quarter	86.21	86.58	1.2%	$ 80.01	$ (0.78)
	3rd quarter	87.41	87.07	3.4%	$ 77.96	$ (2.06)
	4th quarter	87.69	87.56	-1.0%	$ 86.65	$ 8.70
2011	1st quarter	87.62	87.90	-1.9%	$ 94.01	$ 7.37

Source: Energy Information Administration, U.S. Department of Energy.

7. PATTERN OF GLOBAL PROVEN OIL RESERVES RELATIVE TO GLOBAL CONSUMPTION LEVELS

Figure 6. Ratio of barrels of proven reserves to barrels of annual consumption, 1980-2009



Source: Energy Information Administration, U.S. Department of Energy.

8. ADDITIONAL REFERENCES ON INDIVIDUAL GASOLINE CONSUMPTION; ENVIRONMENTAL PROTECTION AND CLEAN-ENERGY INVESTMENTS; AND U.S. FINANCIAL REGULATIONS

Gasoline consumption:

Bureau of Transportation, National Transportation Statistics.

Environmental Protection and Clean Energy Investments:

Robert Pollin, James Heintz, and Heidi Garrett-Peltier (2009) *The Economic Benefits of Investing in Clean Energy*, Center for American Progress and Political Economy Research Institute, http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/green_economics/economic_benefits/economic_benefits.PDF

U.S. Financial Regulations:

Gerald Epstein and Robert Pollin (2011) "Regulating Wall Street: Exploring the Political Economy of the Possible," forthcoming in Philip Arestis ed., *Microeconomics, Macroeconomics, and Economic Policy*, London: Palgrave. Available online at: http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_251-300/WP256.pdf

About the Authors

Robert Pollin is Co-Director of the Political Economy Research Institute, and Professor of Economics, at the University of Massachusetts, Amherst. His research centers on macroeconomics, conditions for low-wage workers in the U.S. and globally, the analysis of financial markets, and the economics of building a clean-energy economy in the U.S. He has been a consultant to the U.S. Department of Energy and the International Labour Organization on the economic analysis of clean-energy investments, and has worked with the United Nations Development Programme, the United Nations Economic Commission on Africa, the Joint Economic Committee of the U.S. Congress and as a member of the Capital Formation Subcouncil of the U.S. Competitiveness Policy Council. His publications can be found here on the PERI website.

James Heintz is Research Professor and Associate Director at the Political Economy Research Institute. He has written on a wide range of economic policy issues, including job creation, global labor standards, the distributive consequences of macroeconomic policies, and human rights. He has worked as a consultant to the U.S. Department of Energy, and on collaborative projects with numerous United Nations agencies, including the International Labour Organization, the U.N. Research Institute for Social Development, the Economic Commission for Africa, the United Nations Development Programme, and UNIFEM. His policy work has focused on the U.S. as well as developing countries, primarily in sub-Saharan Africa. His publications can be found here on the PERI website.