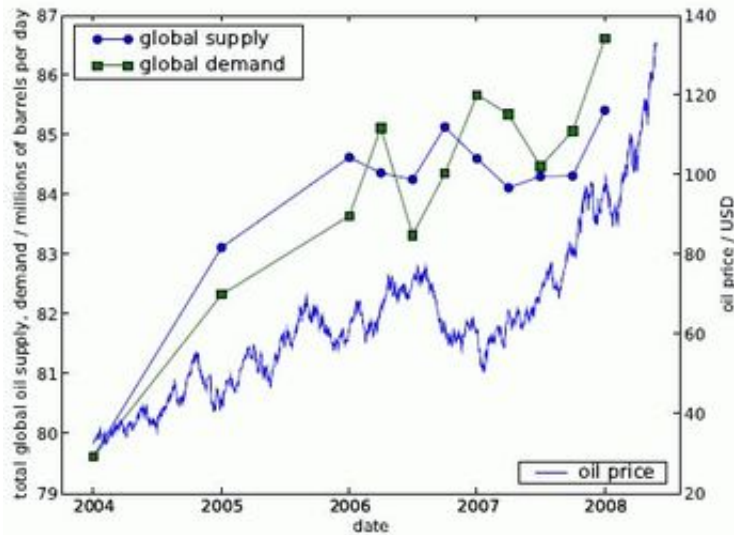


Are We in the Peak of an Oil Bubble?

July 7 2008, By Lisa Zyga



This figure shows the total world oil demand and supply (left scale) and the oil price (right scale) from 2004 to the first quarter of 2008. Data from: International Energy Agency and US Energy Information Administration (<http://www.eia.doe.gov/emeu/international/oilother.html>). Image credit: D. Sornette, et al.

Since 2003, worldwide oil prices have quadrupled. According to a new study, the price of oil is rising at a faster-than-exponential rate, and cannot be sustained. In other words, we're in the midst of an oil bubble, say researchers Didier Sornette and Ryan Woodard of ETH Zurich in Switzerland and Wei-Xing Zhou of the East China University of Science and Technology in Shanghai, China.

By analyzing oil prices over the past four years, the researchers have demonstrated more support for the hypothesis that the recent oil price run-up has less to do with supply-demand interplay and more to do with speculation.

In their analysis, the team gathered data on oil prices since 2005 in US dollars, euros, and other major currencies (to confirm that the results are not a consequence of the weakening of the US dollar). They also examined worldwide oil supply and demand data, specifically investigating the extent of increased demand from emerging markets such as China and India.

Then, the researchers analyzed this data using a method that Sornette's group started to develop in 1996 that identifies bubbles as "transient superexponential regimes" – basically, areas of rapid growth that occur due to a source of positive feedback within the system. The scientists looked at the data in the context of three different models, and all three models revealed the existence of a "log-periodic power law," in mathematical terms – in other words, a bubble. In economic terms, the researchers explain, a bubble refers to a situation in which expectations of future price increases cause prices to temporarily rise without justification from fundamental valuation.

Further, the models showed that the bubble is close to a local peak, and we may have even reached the peak already. On the other hand, the researchers noted, this critical peak may also be embedded in a larger-scale bubble, one that could develop in the coming months and years.

"The most fundamental difficulties [in trying to describe oil prices] lie in the operational definition of a 'bubble,'" Sornette told *PhysOrg.com*.

"There is no consensus. One standard definition is 'exponential growth of price.' But exponential growth of price is normal in economics, because it just corresponds to a constant growth rate. Our definition is

‘faster-than-exponential’ growth of the price, which is necessarily unsustainable.”

The team also identified several particular characteristics of oil price dynamics that may help researchers understand the causes of the bubble. First, in the years 2004 and 2005, worldwide supply, demand, and price all increased together. In early 2006, supply started to drop, followed a few months later by a drop in demand, and six months later by a drop in price.

Around this time, from mid-2006 to early 2007, supply and demand fluctuated. Then, supply, demand, and price rose together, and have been continuing to rise through the most recent data point, which was taken in early 2008.

A comparison of supply and demand showed that, most recently, supply has been exceeding demand by more than a half million barrels per day. Meanwhile, the price continues to increase. Since it appears that the supply-demand balance has only a small effect on the price of oil, the researchers suggest that a major effect lies elsewhere. They point out several reasons why speculation, fed on rumors of rising oil scarcity, may be the positive feedback causing high oil prices.

As one motivating factor, investors could be searching for a new high-return investment following the collapse of three recent economic bubbles in the US (communication technology, which peaked in 2000, real-estate in 2006, and sub-prime mortgage lending in 2007). Also, speculation may have increased due to the deregulation of oil futures in the US in early 2006, corresponding to the fluctuations that occurred shortly after that time. Investors may also be concerned about a weakening US dollar, which may encourage protective hedging against future oil price increases.

“I expect rather soon some calming with a correction of the price,” Sornette said when asked about his prediction of future oil prices. “But it seems that, for the medium term, one has to be bullish on oil.”

More information: Sornette, D.; Woodard, R.; and Zhou, W.-X. “The 2006-2008 Oil Bubble and Beyond.” Arxiv:0806.1170v2. 13 Jun 2008. Submitted to *Physica A*.

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