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Before the United States House of Representative
Sub-Committee of Oversight and Investigation
Committee on Energy and Commerce

Regarding
**Energy Speculation: Is Greater Regulation Necessary to Stop
Price Manipulation? Part II**

Monday, June 23, 2008 11:00 a.m.
Room 2123 Rayburn House Office Building

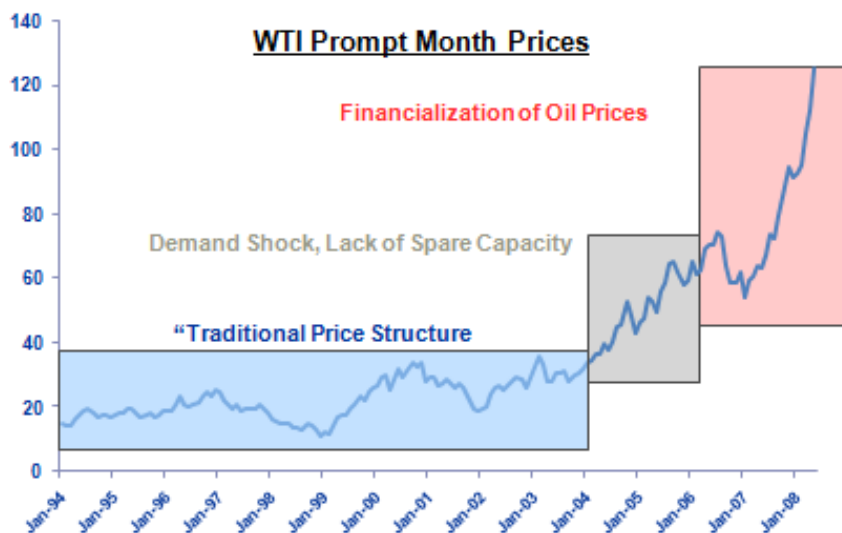
My name is Roger Diwan.

I want to thank the committee for inviting me to testify on the important issue that is the subject of today's hearings.

I have been analyzing and forecasting crude oil markets for the past 15 years and have extensive contacts with oil companies, national oil companies, service companies and on Wall Street and within the hedge fund community. It is important that you know that I never traded commodities and that I am not representing any corporate, financial, or lobby organizations. I am speaking with you as an expert who has spent most of my professional career analyzing crude oil markets, both physical and paper markets, and hope to bring some perspective and background to today's discussions.

I would like first to explain how I view oil price formation in the last ten years, and how a number of structural changes have led to what I call the financialization of oil markets in the last 2 years or so. In the graph below, I define three distinct periods in the oil market, with price formation going through a number of structural shifts:

Oil Prices and Structural Trends



The traditional price structure that prevailed through 2004 was when oil analysts like myself spend their time looking at the supply and demand fundamentals in great detail with the ultimate goal to forecast changes in inventories levels, mostly in the United States. During that time, a very strong correlation existed between stock levels and prices, and forecasting changes in stocks reasonably well was the ultimate goals of most analysts. As you can also see, prices moved in a narrow band, largely due to the fact that OPEC had a very large amount of unused capacity to produce crude oil, what we call in our jargon “spare capacity.” It meant that oil markets expected to see OPEC increasing production every time stocks were low, by just opening the spigots. The internal dynamics in OPEC meant that every time prices were rising, any of the countries with spare capacity had the incentive to increase production by cheating on their assigned quotas. This global spare capacity was extremely large (10 mmb/d) in the mid 1980’s. Over the course of the next fifteen years, low prices, strong demand growth and lack of investment gradually eroded this spare capacity. Simply put, the roots of the bull market are deep, and long-term solutions are required to address long-term problems.

This process accelerated dramatically in 2003-2005 when the world basically faced two consecutive shocks: a supply shock in 2003 when problems in Venezuela and Nigeria as well as the interruption in Iraqi exports reduced supply, followed by a **demand shock in 2004**, when global demand increased by close to 3 million b/d. These two combined forces wiped out most of the remaining spare capacity within OPEC, and left only an estimated 2 to 2.5 million b/d of cushion, most (if not all) of it in one country, Saudi Arabia. During that time, the benchmark WTI price doubled, from \$35 to \$70 as the world adjusted to this new reality. As will be discussed later, one aggravating factor was that opportunities available to international oil companies to invest capital to replace natural decline and create new production capacity were generally scarce as the gate keepers of the most prolific basins generally restricted access. Thus, the opportunities that investors have been able to capture have suffered from relatively high costs and lower productivity.

As oil markets learned to live with low spare capacity, and with the lack of new supply coming from Non-OPEC to force OPEC to shut in some spare capacity, a new reality has emerged: Oil markets, when facing low spare capacity have in effect removed one of the biggest price stabilizers, the ability to add supply quickly when prices rise. In a market without spare capacity, the price risks become one sided: any unexpected news is bullish by definition and this is how we have ended up with a market facing only two types of event risks: bullish and very bullish. We are riding in a car with no shock absorbers, and we feel every bump in the road keenly.

Just as importantly, the lack of spare capacity means that there is little chance that the market will face a punishing action by OPEC to bring prices significantly down. In effect, OPEC as a cartel has lost its ability to control the price ceiling. While some observers might think this would not matter to the organization, the fact is that many members are very concerned by the serious risk of long-term demand destruction for its only product.

Moreover, since the credit crisis of August 2007, oil prices have doubled. In the meantime, the supply-demand fundamentals have not changed in such a dramatic fashion. Oil fundamentals have remained supportive of prices: despite the slowdown of the US and European economies, global oil demand has stayed robust thanks to Chinese and Middle Eastern growth. More importantly, there has been virtually no change in oil supply from Non-OPEC countries, despite numerous forecasts expecting strong growth in 2008 and 2009. Delays of new projects, stronger declines rates across the globe and very disappointing production profiles in Russia and Mexico have created a very strong narrative in the market that oil supply is just not here, and that non-OPEC countries have reached a peak in production. It is certainly not a foregone conclusion, but we are in the 6th year of price rises, and supply has remained fairly stagnant.

This supply narrative is the key reason for another structural change in oil prices: the long term prices for oil have shifted significantly upward. In thinking about prices, it is helpful to differentiate between short-term prices, which tend to be fairly volatile and responsive to changes in production and inventories, and long-term values, which have

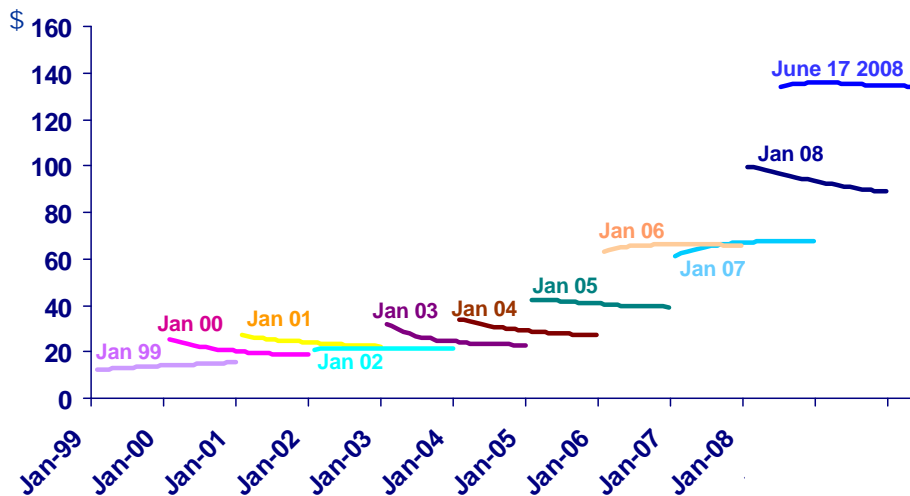
tended to respond to investment levels, marginal costs, and beliefs surrounding limits to production and the longevity of the cycle. For many years, no matter what the near-term price of oil, the long-term price expectation was extremely stable. Around 2006, oil markets began to put a high value on long dated oil as evidenced by a slight contango and much higher prices for long dated crude. Normally oil in the out years is priced lower than oil in the current periods reflecting the cost of money and the cost of oil storage, which is called backwardation (see graph below). But now the combination of an Asian demand narrative (China and India will need more oil), combined with the supply narrative (no new capacity in the medium term, and Peak Oil theory after that) has provoked a fundamental shift in the price structure: while prompt prices started to increase, the long dated prices increased even more, creating a gentle contango (meaning oil prices are starting to get higher in the out years than the near contract).

WTI Strips



24 Month WTI Strips

WTI

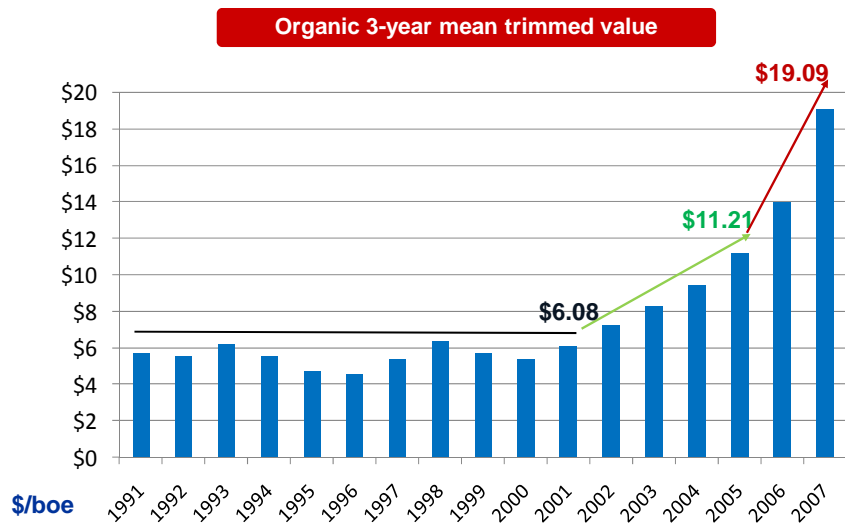


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This shift in perception is the fundamental reason behind the price increase seen in the last few years. And as prices increased, the industry has stepped up investments in upstream activity. The development budgets of oil companies have soared, but this renewed activity has also created tremendous cost inflation. After all, low oil prices since the mid 1980's have forced the industry to shrink and delay investments as profitability went down. Accordingly, the capability of the service sector, which

represents those companies that actually carry out the drilling and building activities for the oil companies, downsized to fit this diminished activity level. Now, those service companies are being asked to do much, much more. In short, the price boom has now created a rush to invest, and now, equipment, people and projects are scarce, so costs have soared. As you can see below, the Finding and Development costs (that is, the cost for the company to access, explore, develop, and deliver a barrel of oil to the market) for the largest oil companies have skyrocketed in the past three years. Most new projects now require a price of \$70 to \$90 dollars to be profitable (to get there, you need to look at F&D costs of marginal projects, and multiply it by three to get the oil price required to get a return of about 10%). It is also critical to note that even when spending money heavily on these expensive barrels for future production, some of these companies have not been able to add as many barrels into their reserve base as they have removed via production. In other words, the barrels are expensive and still the global oil industry is sometimes unable to replace 100% of production.

Finding & Development Costs Skyrocket



Organic costs exclude acquisitions; 3 year mean trimmed (ex 25% outliers)

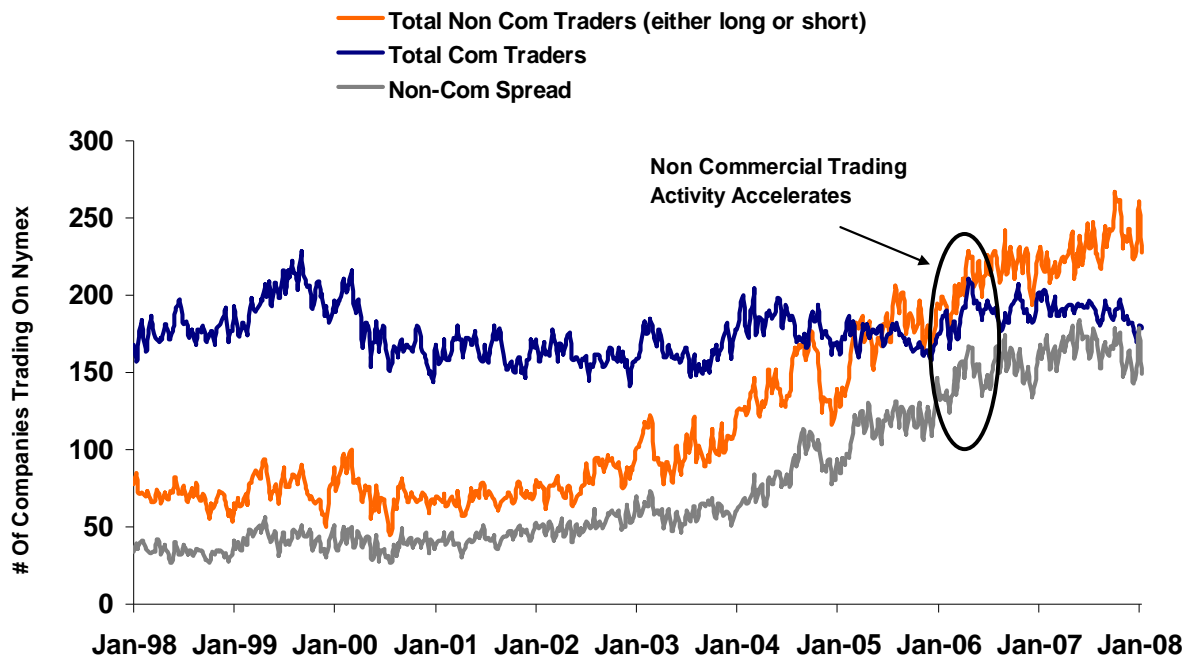
The Mirror Cracked: New Players, New Models, New Opportunities | Page 16

In terms of the fundamentals, it is clear that higher oil prices were needed to attract capital to the industry in order to boost investments. Investments have been depressed in the last 15 years as the world was living off the capacity created in the last oil boom, and the large spare capacity that OPEC was willing to maintain. In a way, the demand in the last 20 years was met by OPEC turning on the spigots of existing infrastructure

and by efficient investments in countries opening to investment to gain revenue in a time of low prices. Now, we have to invest for every new barrel we want to bring on, and for that we need an investment super cycle.

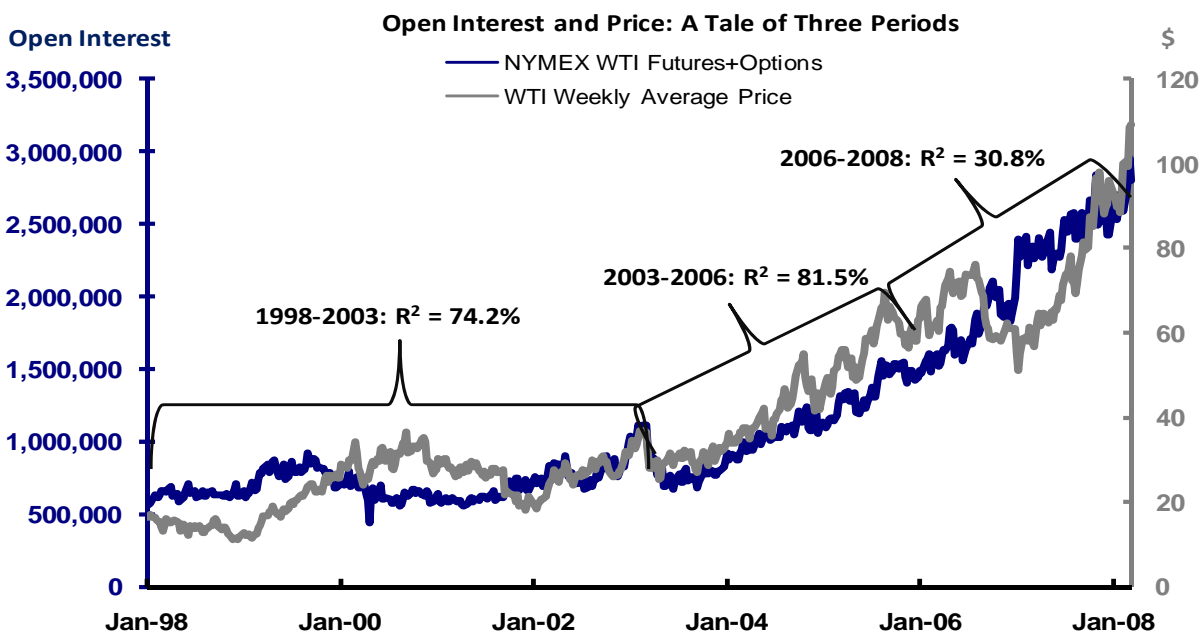
The Emergence Of Oil As A New Asset Class: Financialization Of Oil

As these fundamentals unfolded, another key shift occurred, what I call **the financialization of oil market**: as the OPEC threat of ramping up production has been removed as a significant factor in oil markets, a whole set of new actors have been drawn into the futures markets, and started looking at the fundamentals of supply and demand in a new way: slowly but surely, oil markets have become an attractive area for investments for a number of financial players. Between 2003 and 2008, we have seen the number of or financial companies on NYMEX increase from around 50 to over 250 (see graph below), and this does not include the firms that uses index funds.



During the early phase of this financialization, between 2003 and 2006, we saw a very strong correlation between Open Interest on NYMEX and oil prices. During that period, it is that indicator, the flow of money to the futures market that became the key element to predict prices, with a correlation close to 80%. Clearly, the fundamentals described above, the supply then demand shock, and the lack of spare capacity enticed a lot of

players to come into the oil market. In a sense, these financial players understood what was happening to the supply/demand balance and have bet – correctly – that prices would have to move up and that consumers would be willing to pay higher and higher prices without significantly altering their usage patterns.



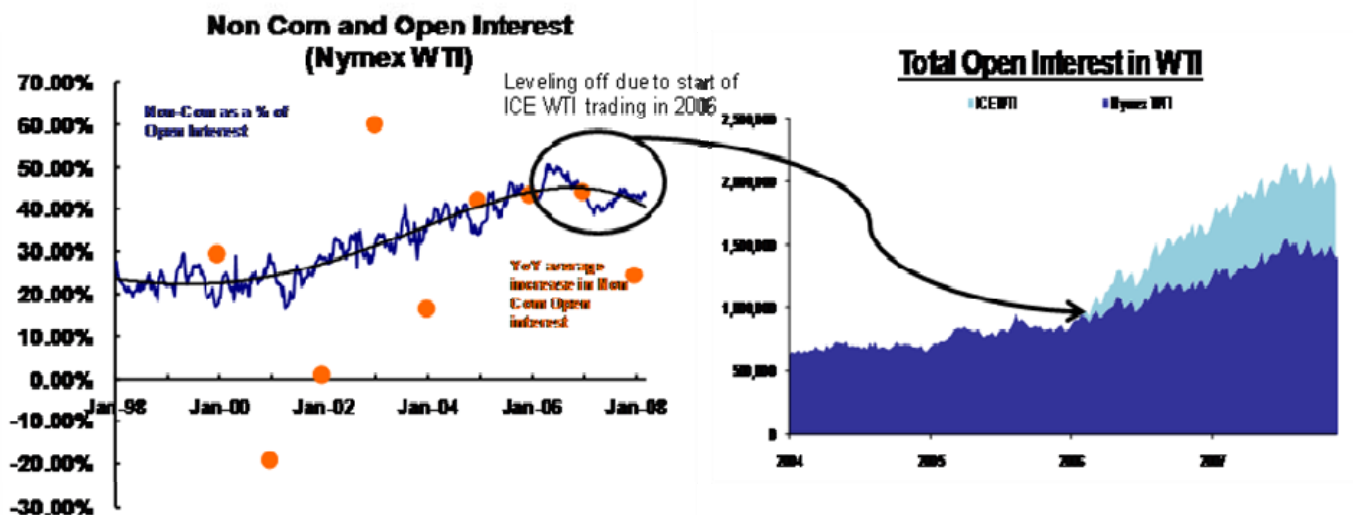
Starting in 2006, the open interest and price correlation rapidly broke down as non commercial trading picked up, bringing into the market an increasing number of financial firms playing out multi-pronged trading strategies.

As the market grew to become more sophisticated, the key determinant of prices, or more precisely the key correlation that provided the best explanation of oil price behavior was the non-commercial net length (the difference between aggregate gross longs and gross shorts) and that strong correlation lasted through the Middle of 2007, until the credit crunch of August 2007. Please understand that this is a correlation; causality, on the other hand, is difficult to pin down and works in both directions. It is also important to note that the behavior of non-commercials can, at times, force the price to drop precipitously, as it did in January 2007. This downward move was

occurring in an environment in which fundamentals were actually putting upward pressure on prices as inventories slowly came down from their bloated status in the summer of 2006.

To summarize, crude oil markets have gone through a transformative period since 2003, with the flow of money and the behavior of the non-commercials providing the key explanation for oil price behavior. That has been made possible by dramatic changes in the structure of the supply-demand fundamentals, which is the disappearance of spare capacity and the enormous rise in the marginal cost of supply (discussed above). This transformative period has added a lot of depth and liquidity to oil futures, which used to be small and largely illiquid markets that only few firms used prior to that.

Interestingly enough, non-commercial trading has steadily increased its share of total open interest on Nymex, until 2006, when it started to level off. This leveling off correspond to the launch of the Intercontinental Exchange (ICE) which does not publish data on the activities of the different categories of investors. In effect, by allowing ICE to abide by less stringent disclosure requirements, a regulatory arbitrage was created, allowing financial players to keep trading strategies hidden from CFTC disclosure requirements. (See graph below).



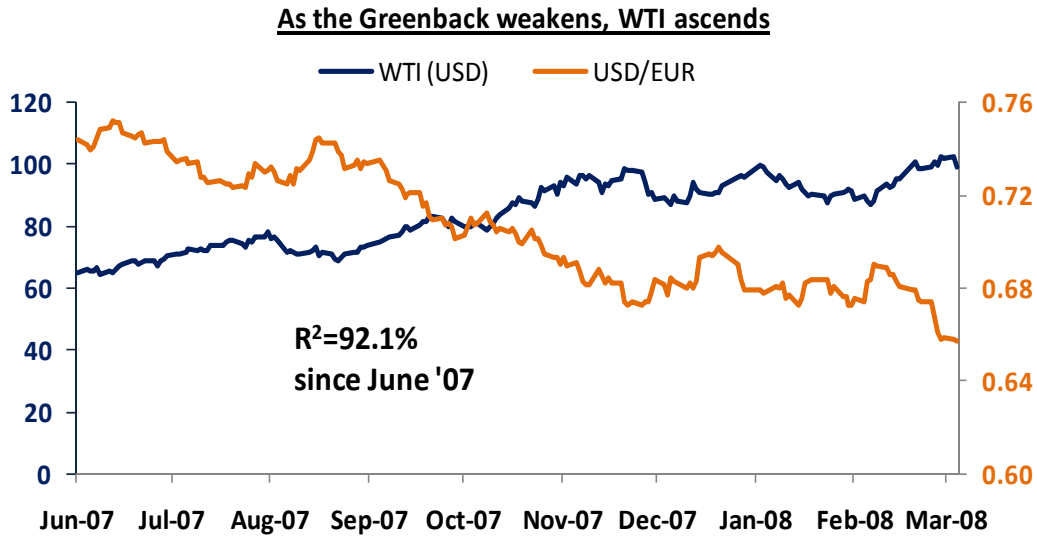
Oil as a Global Hedge

Probably more troubling has been the doubling of oil prices in the last 8 months. Since August 2007, and thanks to the liquidity created in the future markets in the past three years, oil has become a hedging instrument against the weakening dollar and rising inflation. Let me explain how this cycle has been created:

The credit crunch that emerged last summer in the US has had an indirect impact on oil prices. At an even more basic level, however, it has been the disequilibrium in the US economy and the concomitant trade, savings, and fiscal deficits that have driven oil prices. This is what I call the “macro fundamentals” of oil, in contrast to the “oil fundamentals,” which are our traditional supply and demand analysis.

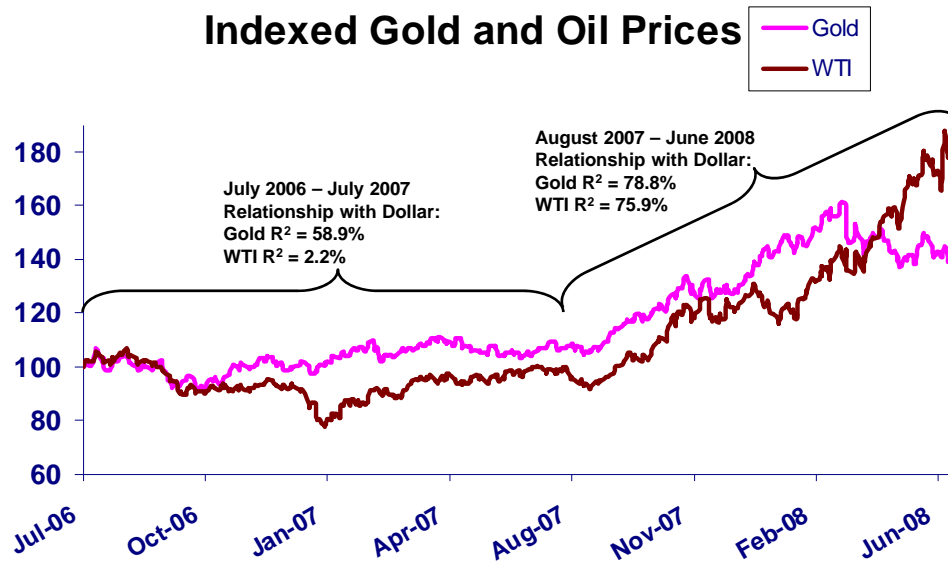
The linkage between oil and US dollar works the following way:

- As the US Federal Reserve started to ease monetary policy in Sept. 2007 with a series of cuts in the short-term interest rates, dollar-denominated assets became less attractive to investors, prompting them to higher yielding assets, which weakened the dollar.
- As the dollar declined, oil has emerged as a natural hedge to the dollar, and there is a very strong negative correlation between oil and dollar. Since this summer, the movement of oil prices and US dollar are strongly linked, with the weakness of the dollar driving the strength in oil prices. In the last 8 months or so the coefficient of correlation is close to 90% (see below). Before 2007, WTI price and the US dollar were not correlated. From 1999-2007, the coefficient of determination was only 44.1% between the USD/EUR exchange rate and WTI price.
- Investors fleeing the lower-yielding dollar moved funds into oil futures, which were being viewed as a relatively higher-yielding financial instrument, buoyed by a surge of global capital flow. Additionally, oil futures bought and sold in dollars became more attractive to foreign investors as the dollar further weakened against such investors' home currencies. These financial market dynamics resulted in a dramatic alignment between dollar and oil price movements.



Moreover, as oil prices increased and inflation expectation started to increase, that further reinforced oil as a hedge against inflation. So since last summer, oil has taken the role that gold has traditionally played. And if you look at the correlation, gold and oil have moved in the same proportion against the dollar. (See graph below)

Oil the New Gold



Increasing Money Supply Adds a New Twist

With credit markets still in the throes of the subprime mortgage meltdown, the Federal Reserve has been attempting to breathe new life into markets by expanding its traditional lending facilities available to financial institutions.

The mechanism underlying the new available credit facilities have been implemented using government repurchase agreements, which “sterilize” the fed’s intervention and theoretically limits their impact on inflation and exchange rates. However, aggregate money supply has seen a sharp increase since monetary easing began last fall. The unintended consequence of increasing the money supply has lead to a further injection of liquidity in markets that are already flush with new capital flows, such as oil and gold.

How Oil Has Become A New Asset Class?

The key element of the financialization of oil markets, and their correlation (positive or negative) comes from the fact that oil now acts as another asset class for a wide variety of asset managers, pension funds, endowment and hedge funds. These investors are making broad asset allocations decisions, and investing in the commodity directly (as opposed to the more traditional oil and gas equity allocation) and their incentive stems from a number of factors:

- If one believes in the broad Asian demand narrative, it is easier to invest in the commodity directly since it is difficult or impossible to invest in local companies that would benefit from this growing market.
- If one believes in the supply narrative, investing in the commodity, especially in the long dated months makes a lot of sense.
- If one is looking to hold real commodities that will increase in value in an inflationary world, oil probably makes sense.
- If one is holding assets in dollars, and believes that the dollar will continue to decline, investing in a negatively correlated asset class makes perfect sense.

Thus, if you can invest in the commodity itself as investors have been doing in gold for years, the reasons to invest in oil as a commodity are plenty, and the ones listed above are very basic ones. Plenty more exists, depending on your strategy. The key point here is that once the door has been opened through the commodity indexes, and once you have removed the spare capacity threat that OPEC had, financial players have now another asset class to invest in, speculate or hedge.

Moreover, now we have entered a world where portfolio allocation decisions include commodities, so sometime the sharp moves in oil prices have more to do with changes in asset allocations than pure oil fundamentals. As an example, if a consensus start to emerge in the financial world that US interest rates are set to fall, as it was the case late 2007, a large number of portfolio managers are likely to change their allocations of funds and dedicate a larger proportion to commodities in general and oil in particular. Similarly, if you believe that the European Central Bank is likely to increase interest rates and strengthen the Euro vis-a-vis the Dollar, you will be inclined to increase your exposure to oil futures.

To a large extent, it is these “macro fundamentals” that are now driving oil prices, and the instruments of choice to the financial community are the commodity index funds. Moreover, it is clear that the lack of position limits for these index funds have created a useful backdoor allowing the financial community to invest more money in oil futures than the regulators intended originally. These index funds have become the primary tool for hedging, investing or speculating on commodities. They probably represent the single largest components on oil futures and their sizes have been calculated to be close to \$280 billion.

Now that oil has in effect become a new asset class, we should make sure to have the right regulatory framework, and make sure that we do not give incentives to invest in one asset class over the others, be it through regulatory loopholes or a lower transaction costs such as margin calls.

Most frustrating for oil analysts is the lack of transparent data to look at the exact size and flows of the different categories of players on the oil markets. The data released by the CFTC does not allow analysts like me to understand the broad movements by the financial players in the market. The categories used by the CFTC are too broad and are meaningless if you allow the index funds to be categorized as commercials and if you don't break down these categories in smaller and better defined entities. I find it ironical that we constantly require more data transparency from the OPEC producers be it on their production or reserve data but we cannot manage to do the same in our own backyard on one of the most crucial if not the key determinant of oil price formation.