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10 Market Issues to Ponder

2010 Annual Meeting & Natural Gas Forum

CENTER FOR ENERGY ECONOMICS
Bureau of Economic Geology
Jackson School of Geosciences, The University of Texas at Austin

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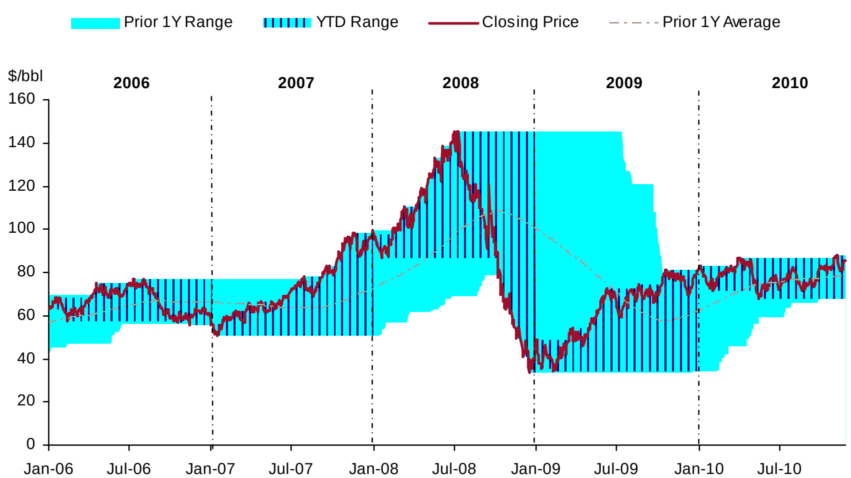
#1. Is this year's outlook (battle) last year's outlook (battle)?



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

in $/bbl	2008	2009	2010 (YTD)
Mean	99.95	61.96	78.69
Min	33.87 on 12/18/08	33.98 on 2/18/09	68.01 on 5/20/2010
Max	145.29 on 7/3/08	81.37 on 10/21/09	87.81 on 11/10/2010

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

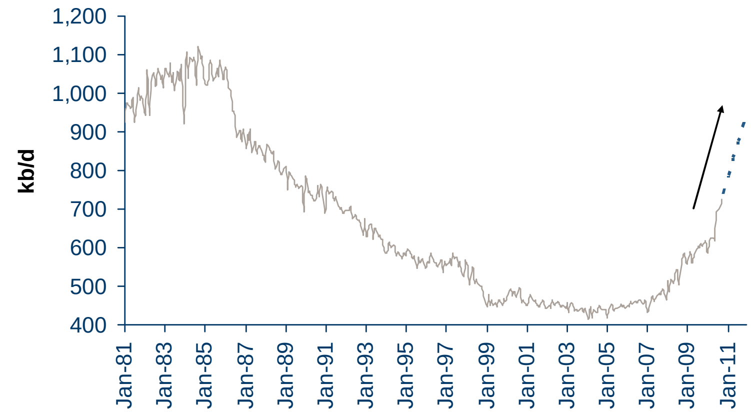
- Analysts of the oil market are like analysts of the cold war in 1989-91 – they didn't like the fact that it was over
- Peak oil, rampant demand are very 2000s. It's now the 2010s
- While it may be that full cycle effects didn't work through by 2008, many of them did work through, especially on the supply side where high prices have triggered higher and more effective/efficient upstream capex
- The demand response so far has as much chance of being a misleading rather than a leading indicator

2. Supply response not as robust as might have been, but not to be sneezed at

- The main global story still unfolding is natural gas, where the global de-linking of oil and gas prices looks inevitable
- There's no doubt that N. Amer. natural gas and oil are responding very robustly
- There's doubt about two critical issues:

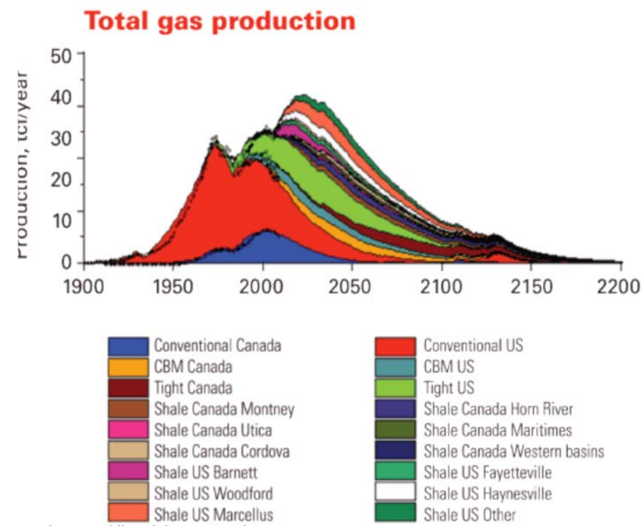
1. Is the growth sustainable?
2. What's the impact of environmental and political impediments?

Midwest (PADD 2) Field Production of Crude Oil and Projection (in kb/d)



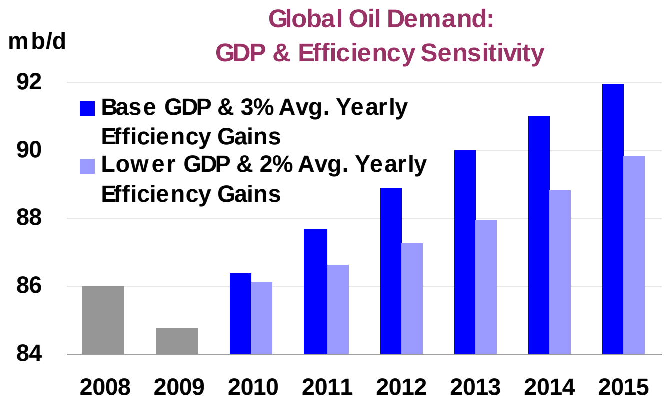
Source: EIA, Credit Suisse Commodity Research

Potential US Natural Gas Production

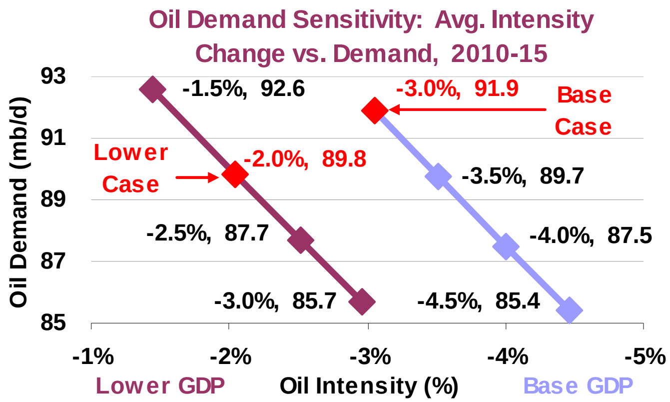


Source: Oil and Gas Journal

#3. Demand response in 2009-10 is likely overstated



Source: IEA



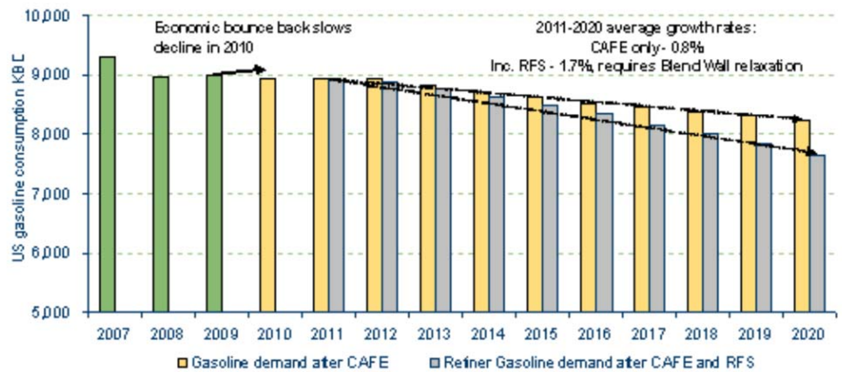
Source: IEA

- The "back to the 2000s" crowd sees demand accelerating because of higher urbanization, higher growth, bigger populations, following path of current OECD countries
- But every indicator from past price increases shows significant efficiency gains in demand
- China, other EM policies are aiming at significantly lower energy intensity paths
- 2010 upside "surprise" includes significant unmeasured tertiary inventory rebuilding just as 2009 reflected significant inventory draws

#4 Don’t laugh too loud, but US “energy independence” isn’t a joke

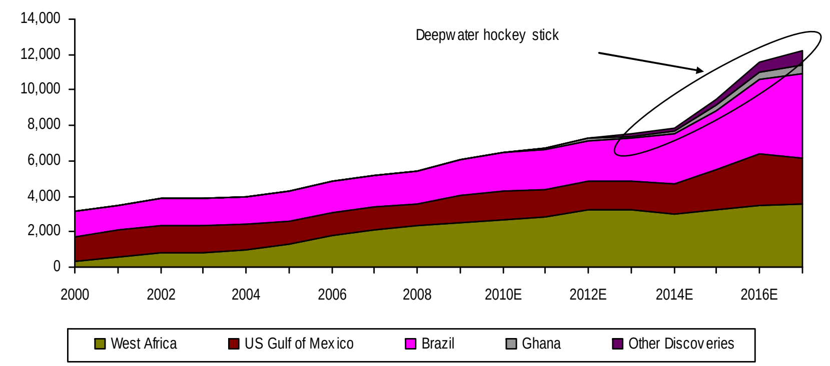
- US gasoline demand could fall by 2-mb/d, while diesel demand rises by 800-k b/d, a net drop of 1.2-m b/d
- US deepwater output could add 1.7-m b/d by 2020
- Four new oil plays could add net 2.5-m b/d by 2020
- That’s a net 5.2-m b/d drop in US import depends, or 50%
- This would likely happen if markets were left to themselves
- Politics/environmental restrictions are the supply hurdles, not geology

Impact on US Gasoline Demand of Tighter CAFÉ and RFS Requirements



Source: Credit Suisse Equity Research “US Refining Sector” April 14, 2010

Deepwater output should double by 2017 to 12.2-mb/d



Source: Credit Suisse Equity Research Estimates,
Sept 16th, Fuel For Thought, "Range-bound Oil Prices for Longer"

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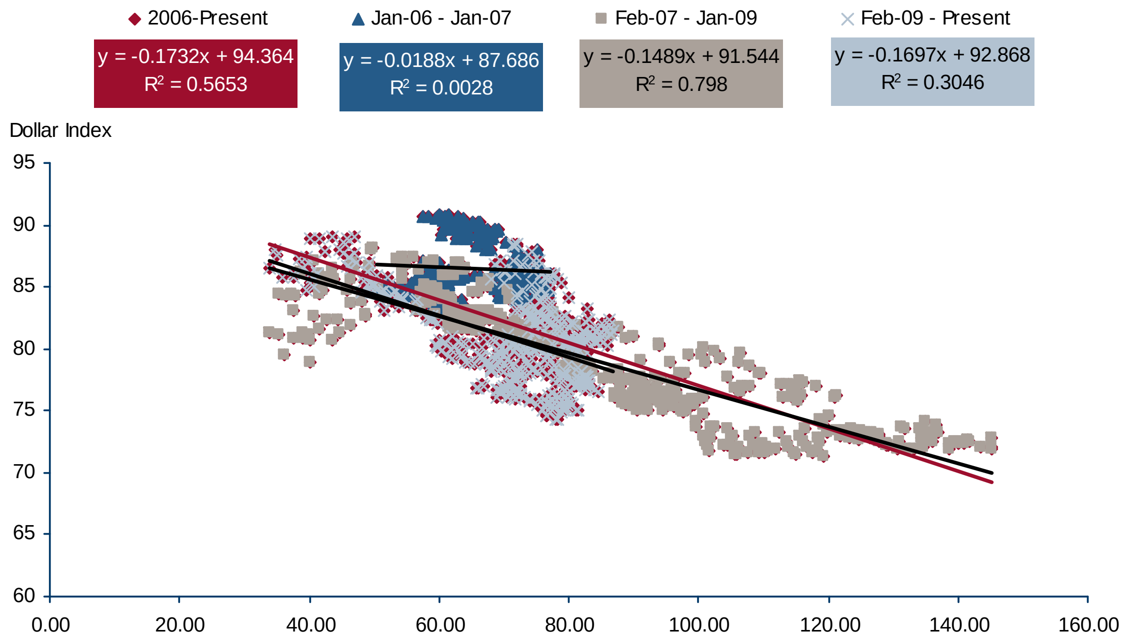
#5. QE-2: many look to a depreciating US dollar to lift prices, but oil vs. US$ correlation also returning to “norm”



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

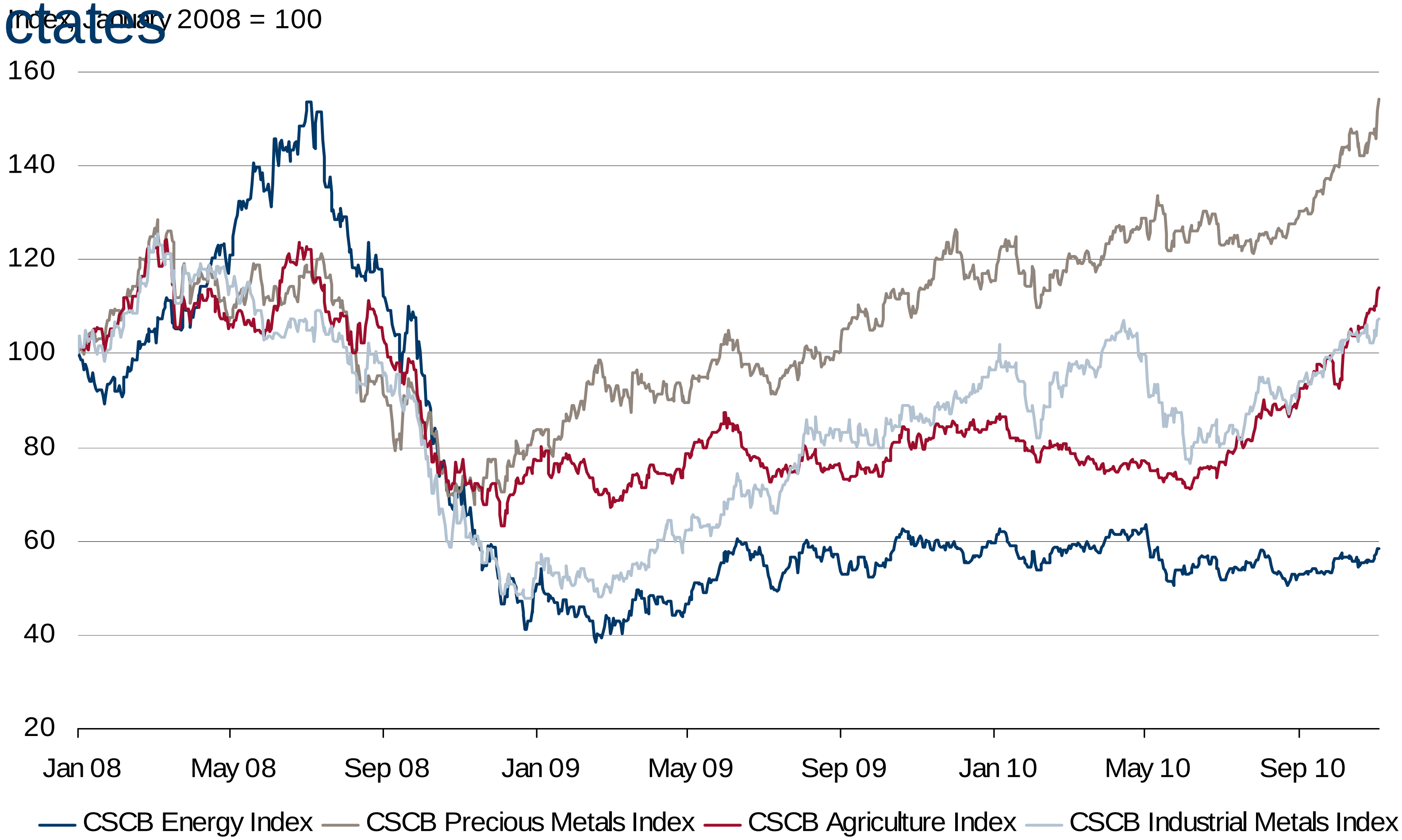
Historically, crude oil price isn’t correlated with the dollar – it’s been a random walk

In macro upheaval of Feb. 2007-Jan. 2009 a positive correlation unfolded

– Just before then, from Jan-06 to Jan-07 WTI vs. US $ has a R^2 of less than 3% showing no relationship

After 2009 relationship again at low level (R^2=30%, vs. 80% during the crisis)

#6. Despite short-term macro moves, commodities are becoming more divergent, following fundamental dictates



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse / IDC

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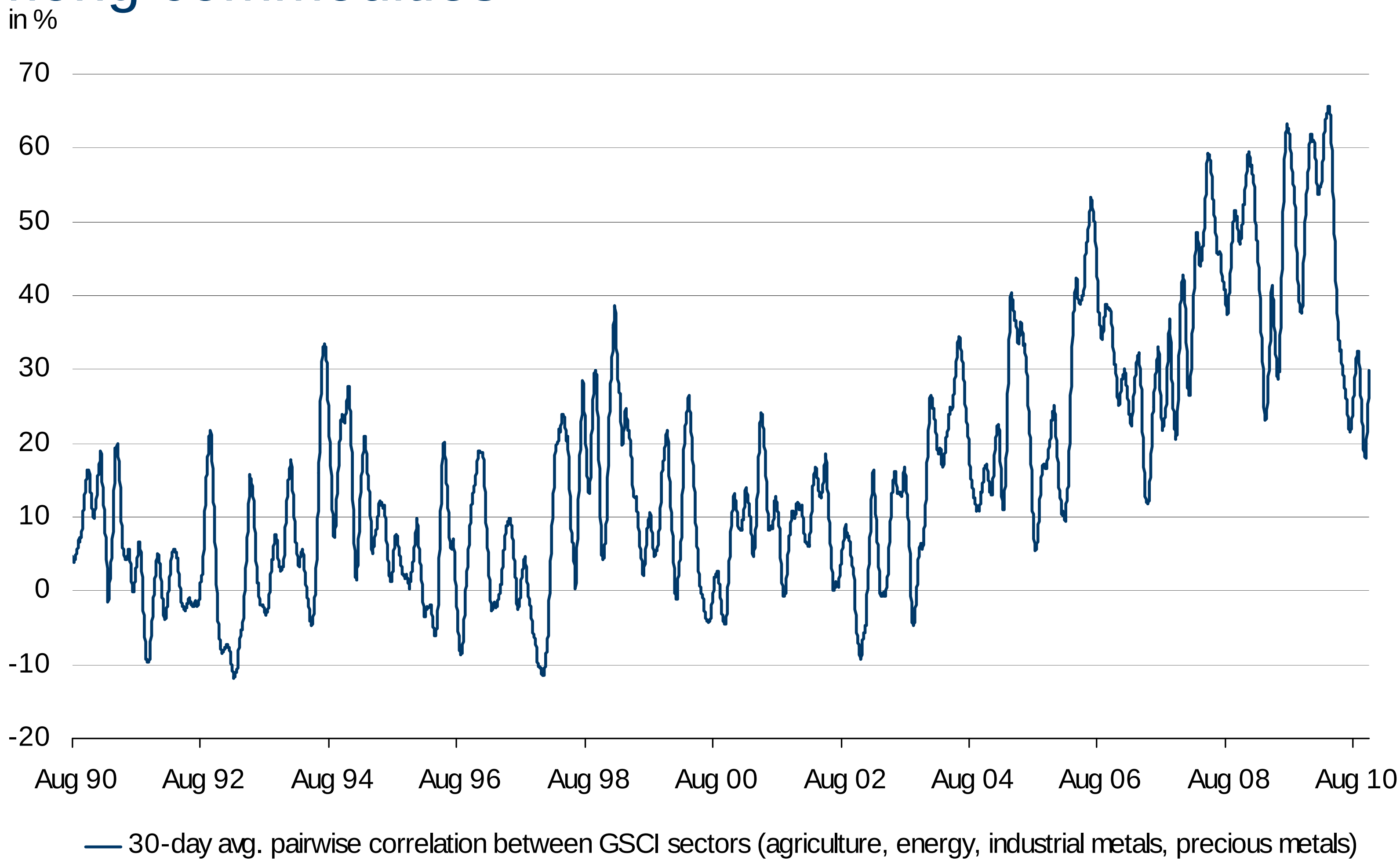
#7. As systemic risks falls, expect more divergence among commodities



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse / IDC

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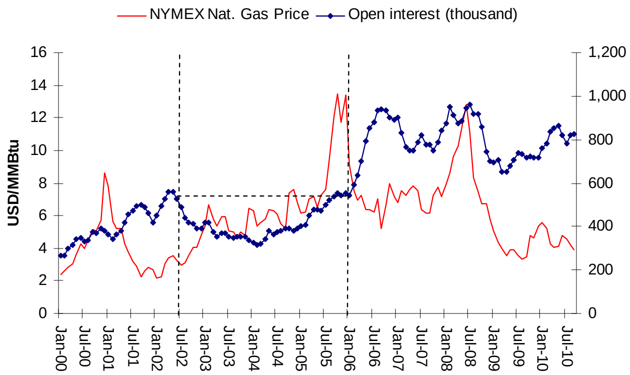
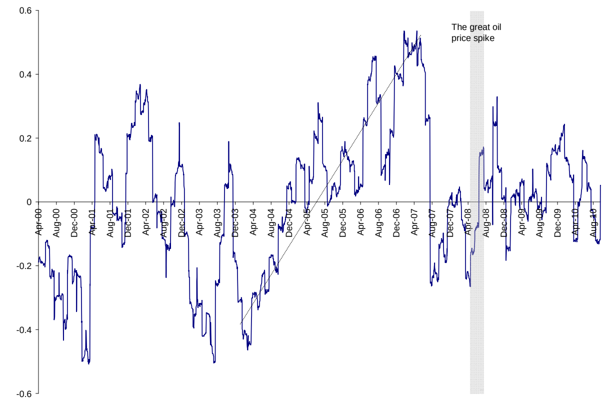
#8. Guilt by association: there is no correlation between open interest and commodity prices

NYMEX Natural Gas and open interest (prompt month average)



NYMEX WTI crude oil prompt month, 63-day moving average



Source for both graphs: Credit Suisse Global Commodities Research, the BLOOMBERG PROFESSIONAL™ service.

- Clearly, large volumes of investments flowed into commodities futures markets because prices were rising 2004-2008
- No matter how you slice it, the correlation between financial investments and prices is low
- There's no clear causal relationship over the long term, over the short term, or for any single commodity, be it agricultural, precious metal, base metal or hydrocarbon

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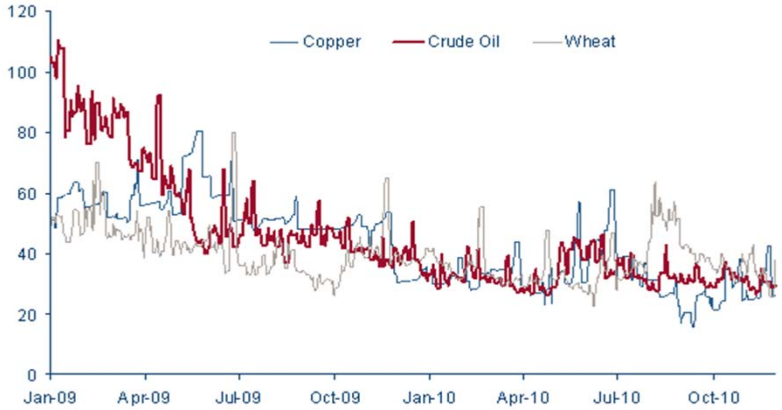
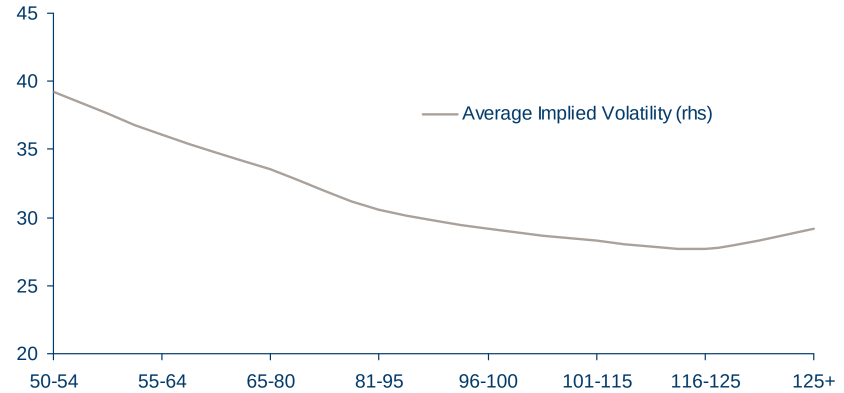
#9. Unlike grains, the energy complex and base metals saw decreasing volatility during 2010 – another return to normal?

Historical Implied Volatilities (Jan-09 - Present)



NYMEX WTI Average Implied Volatility by strikes for Dec-11 Calls



Source for both graphs: Credit Suisse Global Commodities Research, the BLOOMBERG PROFESSIONAL™ service.

- Crude Oil volatility has been traded down from the 2008 and 2009 highs (80-90%) returning to an average of 33.76%ytd
- Average implied volatility shows that the market will more likely be in a slight upward trend in 2011
- But no strong upward jump is to be expected, CBOE Crude Oil Vol index reached its lowest level since April at 29.86% on 11/05

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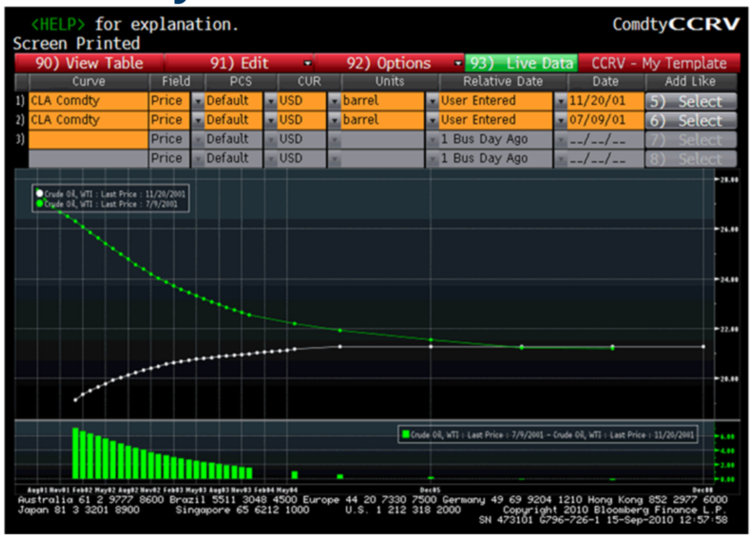
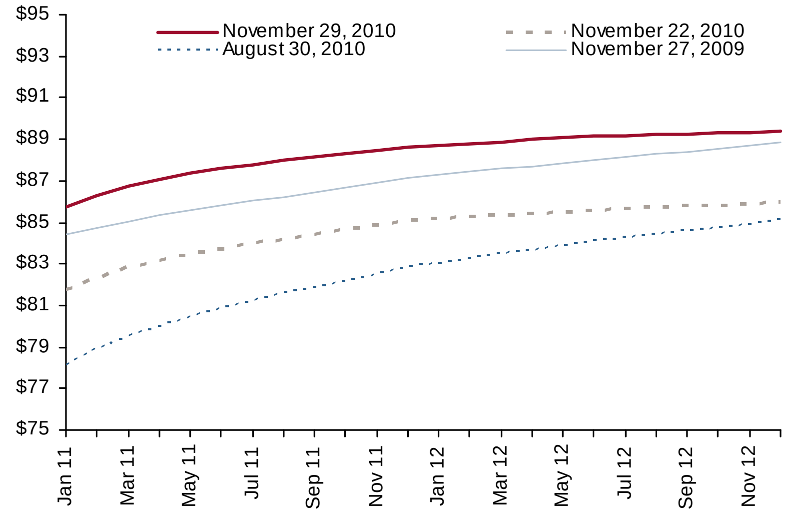
#10 There is not yet a return to normal with respect to the industry’s cost structure



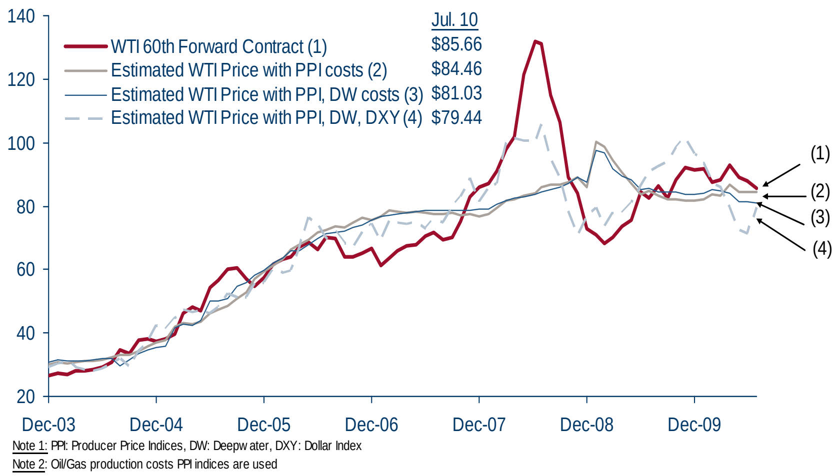
Source: the BLOOMBERG PROFESSIONAL ™ service



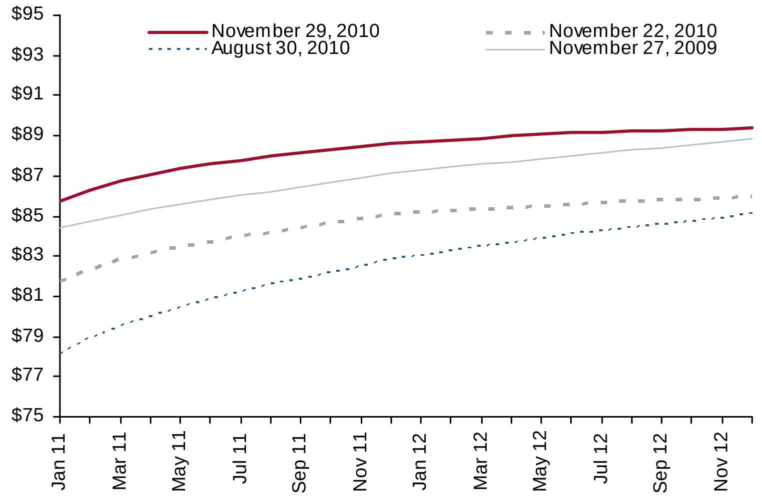
Source: the BLOOMBERG PROFESSIONAL ™ service, Credit Suisse Global Commodities Research

- Oil is a lot like other commodities – the old normal had a clear mean-reverting price (for oil it was $21); the new normal sees range bound in front of market, wide range of deferred prices
- Does a new normal require a new mean reversion? The question is whether long-term cost curves are going to become stable

Upstream costs indicate forward prices/curves are inflated



Source: US Labor Statistics, Credit Suisse Global Commodities Research



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

- WTI 60th month contract price as of close 11/29: $ 90.01
- Three sets of cost indicators: (1) our indicators point to prices <$80; (2) average F&D costs point to ~$75; (3) highest marginal cost projects point to $55-60
- Are oil prices going to come under same forward price pressures as US natural gas recently suffered?
- Can Chinese buying, view of increased Saudi financial needs keep a rising floor >$80?

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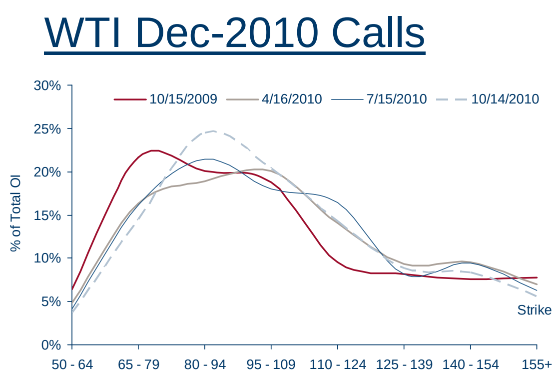
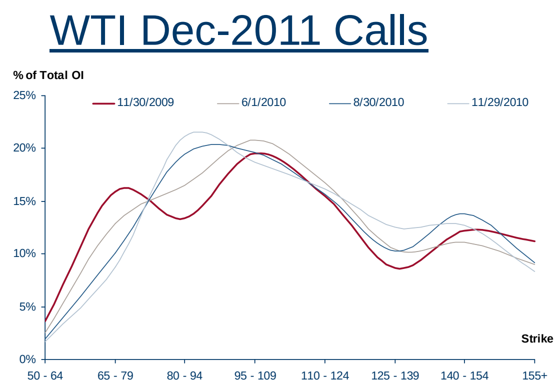
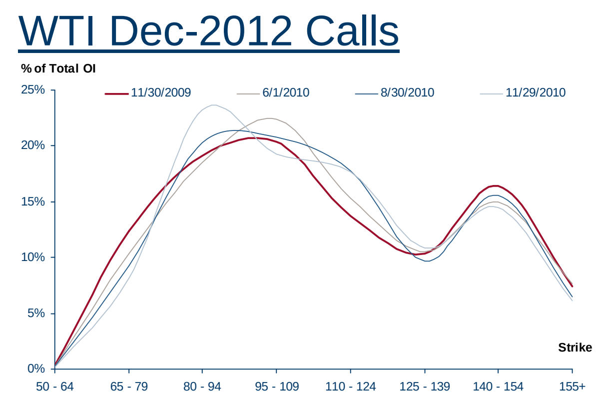
Financial instruments also depict range-bound oil market, but stubbornly price in higher likelihood of upside breakout







Source: API, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

- Analytical community seems biased toward a 'return to 2008'
- Also among all asset classis, only commodities bring tail risk rewards
- Commodities are coincident indicators; equities are leading indicator
  - Last summer drought, heat, provided exceptional returns for grains
- Most commodities options have skewed distributions (see graphs above)
- Tail risks are good reasons to see commodity outperformance, whether by disruption, higher demand, inflation, or dollar depreciation

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