Issue #1 **June 2009**

CMMB Emerging Markets Weekly

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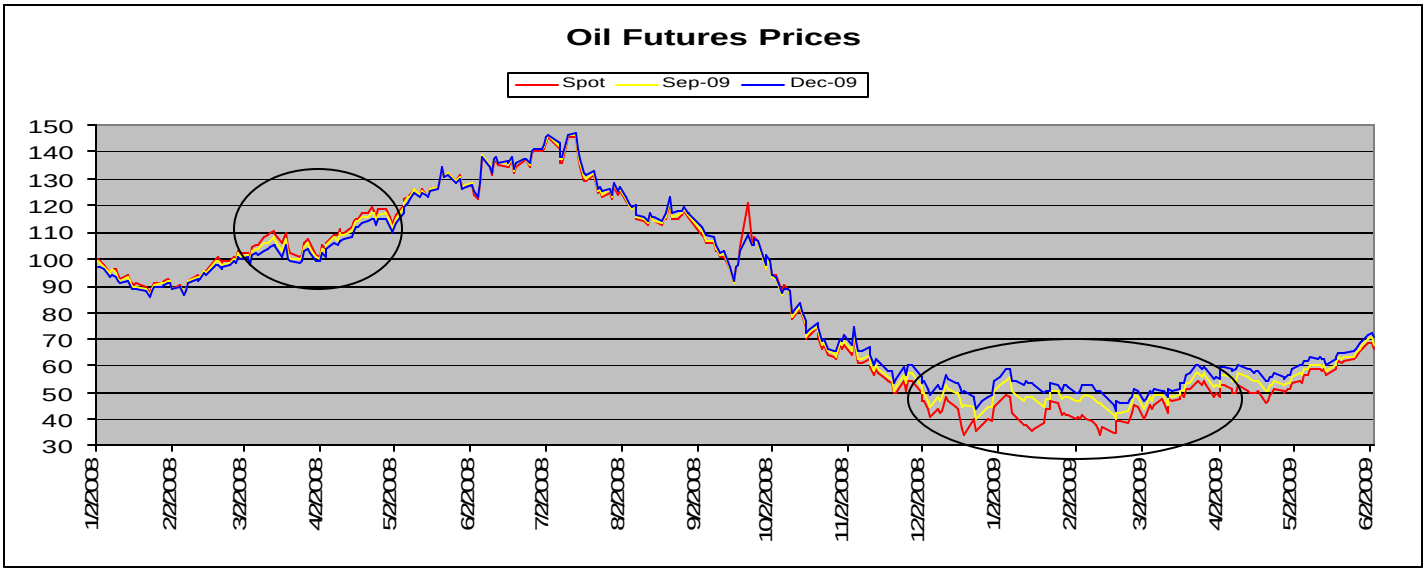
A Mathematical Perspective of Energy Prices…

A Case of Contango

Most people have a basic understanding of some economic arguments for the movements in energy prices, but now you're going to see how energy prices move from a technical perspective, and how we 'Math People' look at these things to make daring predictions.

There are some terms that will appear in this article such as spot price which is just the current quoted price for the earliest delivery for a commodity such as oil and futures price which is the price for future dated deliveries of commodities. Contango (not a form of dance) is a term used in the commodities futures market describing an upward sloping forward curve i.e. the price of a commodity (such as oil) for future delivery is higher than the current or spot price. This condition is usually the norm and reflects immediate availability of supply for the commodity as well as storage costs. The opposite of this is called Backwardation (yes this is an actual word not just used to describe a state of lesser intelligence) which occurs when prices for future delivery is lower than the current price and is usually indicative of supply shortage. If we examine the trend in the spot and future oil prices in chart 1 it shows that backwardation in early 2008 arising possibly out of a shortage of supply due to increased demand and trading activity, which arguably helped to fuel the unprecedented increase in the oil prices. Similarly when it was on the down trend in early 2009 there was a large disparity between the spot and futures prices back to contango indicating an excess supply pushing prices down to the mid 30's.

Chart 1



Given the historical price movement patterns and trends what are the future prospects for energy prices, particularly oil and natural gas? Chart 2 below shows the five year history of oil prices versus a 200 day moving average for the period (i.e. every point on the curve is the average of the past 200 days prices). Moving averages are popular analytical tools used to identify trends or changes in trends. Accordingly, from a purely technical perspective whenever the price convincingly went above the moving average there was a sustained rally and when the moving average was broken on the down trend there was a rapid decline in prices.

The current or spot price for oil is now, once again breaking the moving average on the way up. This together with the tightening of the spot and futures prices may suggest a more sustainable increase in prices rather than just a temporary spike. Apart from these technical factors supporting a sustained rise in oil prices, other fundamental and/ or geo-political events such:

- OPEC's agreement not to increase output at their last meeting in May,
- The ongoing tension in Nigeria which is disrupting oil production,
- The fact that we are now entering the hurricane season which frequently disrupts supplies from the Gulf of Mexico and
- A general feeling that the global recession may not be as long as initially expected.

At the time of writing spot oil prices have been hovering around the US$66 – US$68 per barrel (bbl) while the December futures prices have been in the US$70 – US$72 bbl range, so based on the analysis above and the elevated futures prices, my view is that oil may break through US$75 bbl barrier once more and trade around those levels possibly going as high as US$80 bbl to the end of the year.

Natural Gas, which is a key component of Trinidad and Tobago's energy revenue, is still trading at prices well below the 200 day moving average which indicates a slower recovery for this commodity, while year-end futures prices are around US$5 mmbtu. It is interesting to note that there is only a 55% correlation between oil and natural gas prices so a rapid recovery in oil will not necessarily imply an equivalent recovery in natural gas as we are seeing now.

Chart 2

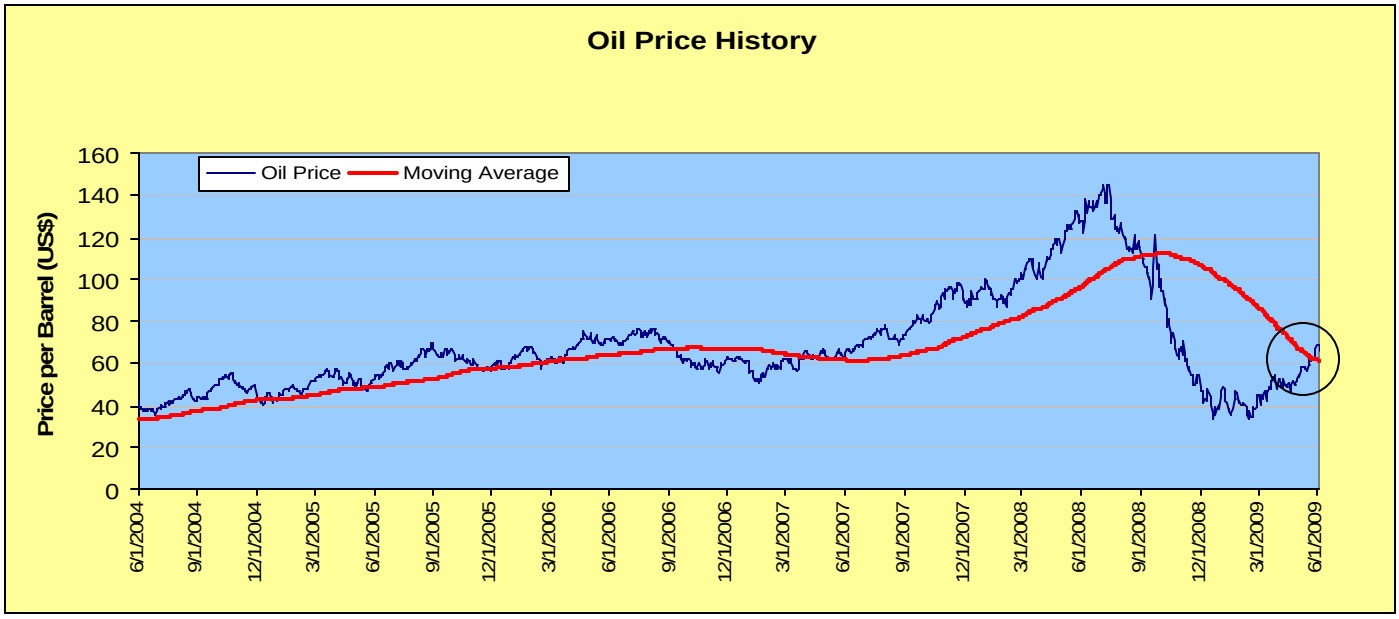
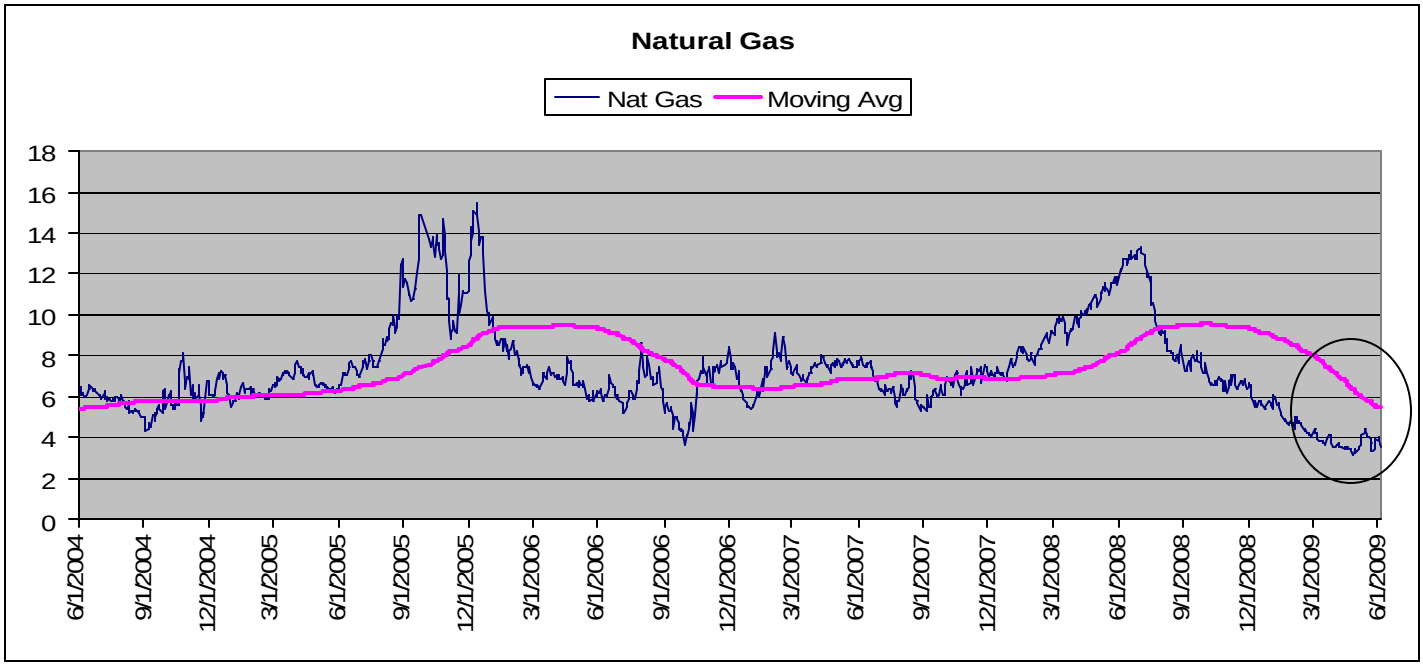


Chart 3



Rising oil and gas prices is good news for Trinidad and Tobago since the budget is based on revised prices of US$45 bbl for oil and US$$3.25 mmbtu (wellhead price) for natural gas,. The oil price has already exceeded the budget price. The budgeted natural gas price (does not include the auxiliary costs such as liquification, storage, transportation etc.) which would equate to a higher final delivery price is still above the current Henry Hub market price of around US$3.50 mmbtu however this price is also expected to increase. The rising oil prices if sustainable as I am expecting, should result in a

reduction in unemployment particularly in the energy sector. The government can use any increase in revenue that the higher prices would generate to fund some of the cost of the CL Financial bailout without raising their levels of debt. This will be a better approach than allocating funds to all the 'back burner' construction projects which will again lead to inflationary pressures. In the financial sector, US$ liquidity should improve with any increases in the price of oil and natural gas as multinational energy companies will once again be a source of significant foreign currency inflows into the system, through tax payments, local expenditure and so on.

Focus needs to be shifted to diversification since around 60% of government revenue comes from energy with over 40% from natural gas alone. Even if oil and gas prices do increase, the volatility of these prices is still quite high. Oil price volatility has been increasing over the years, for the years 2004 to 2006 the average annual volatility ranged from US$4 to US$6,while the annual volatility for 2007 was US$12, 2008 was US$28 and for the half year 2009 the volatility is US$8 (which equates to an annualized volatility of US$11). The annual volatility shows on average how much the price can vary (up or down) in one year. The natural gas trends are the same with 2008 annual volatility of US$2 and for 2009 half year an annualized volatility of around US$1. Price swings of US$11 for oil and US$1 for natural gas can present serious risks to energy based economies such as ours. As one of my colleagues keeps reminding me as I write this piece 'what goes up must come down'.

Our leaders have much history to glean from – the energy sector bust of the 1980's, and of course the events of the past year. The analysis above shows this boom and bust cycle will continue. The Government should use these lessons to push ahead with a proper diversification program. These commodities will not last forever and we should not be constantly at the mercy of global market forces. Our windfalls must be used wisely to equip us to better deal with the down times in the global markets.

FINANCIAL & ECONOMIC INDICATORS

As at 4 June, 2009

Exchange Rate/US$	Closing Value	Previous Week
Yen	96.58	96.85
Euro	1.40	1.39
Jamaica	89.09	89.00
Guyana	204.70	204.20

Commodity Prices	Closing Value	Previous Week
Crude oil (US$/bbl)	68.81	65.08
Natural Gas (US$/mmbtu)	3.58	3.55
Gold (US$/Troy Ounce)	980.25	959.45

Eurobond Indices (As at 04-June-09)

Lehman Brothers Global Aggregate Index (Return % YTD)	0.76
JP Morgan EMBI+ (Basis points)	433
JP Morgan Central America and Caribbean Index (CACI) (YTD return %)	17.48

Policy Interest Rates (%)	Closing Value	Previous Week
United States	0-0.25	0-0.25
Euro Zone	1.00	1.00
Japan	0.10	0.10
Brazil	10.25	10.25
Trinidad	8.00	8.00
Jamaica	17.00	17.00
Barbados	3.00	3.00

Market Interest Rates (%)	Closing Value	Previous Week
US 90-day T-Bill	0.14	0.16
US 10-Yr Treasury	3.71	3.46
3-month UK Libor	1.27	1.28
Japan 90-day T-Bill	0.33	0.33
Brazil 90-day T-Bill	9.15	9.81
TT 90-day T-Bill	2.62	2.52
Jamaica 90-day T-Bill	19.21	19.82
Barbados 90-day T-Bill	3.93	3.93

Sources: Bloomberg, CMMB, Central Bank of Trinidad and Tobago, Bank of Jamaica, Central Bank of Barbados, www.lehman.com