

Oil prices once again are on the rise, with some analysts predicting ‘super-spikes’ in the near future to match the price rises of the 1970s. *Eric Fishhaut* summarises some of the key changes, and looks at how traders can make use of the volatility in the markets through use of correlation techniques

Petroleum price surges

★ There seems to be little holding back the prices of the entire petroleum complex. Since closing at \$43.45 on December 31, 2004, oil prices as traded on the New York Mercantile Exchange (Nymex) have climbed over 30% in the first quarter of this year. US oil futures have averaged more than \$50 per barrel so far in 2005: up from a record \$41.48 last year. On April 1, the front-month contract closed at \$57.27 – the highest since trading began in 1983. This mark is 67% higher than one year ago. And on London’s International Petroleum Exchange (IPE), Brent Crude futures hit the \$56.50 mark – up by more than 40% in the first quarter and more than 80% from one year ago.

Gasoline futures prices in the US have demonstrated an even more impressive surge. Prices on the front month have reached \$1.73 per gallon – up 58% in the first quarter. The latest price run seems to have been fuelled by multiple factors. Possibly the largest factor, the outlook of supply and demand status, seems to be somewhat clouded.

Supply and demand

Supplies for gasoline are highly sensitive to interruption. Recent problems at oil refineries in the US and abroad have increased worries that gasoline demand this summer will not be met. An explosion at the BP oil refinery south of Houston – the third largest refinery in Texas – along with an outage at the Petroleos de Venezuela’s key Amuay refinery increased concerns. US

gasoline demand has been running 2% higher than in the corresponding period last year, despite record prices at the pump, removing any comfort felt from a 6.3% inventory surplus compared with last year (see figure 1). Meanwhile, gasoline reserves are falling. The EIA has reported that US gasoline supplies fell by 2.9 million barrels to 214.4 million barrels in the last week of March – the fourth weekly decline in a row ahead of summer, when consumption peaks.

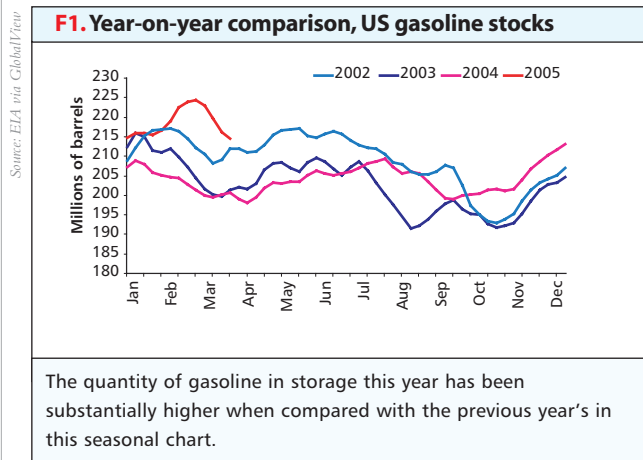
Many point to the demand growth in emerging economies as a key market driver. But on that front, Chinese petroleum demand growth is showing signs of a slowdown, based on the trend of the past four months. Year-on-year oil demand growth in China slid sharply from 15.8% in November 2004 to 10.5% in December and 5.6% in January this year. This may be due to higher oil prices rather than a cooling off of the economy, according to some analysts.

Crude supplies in the US have been growing – in fact, they recently hit their highest level in nearly three years (see figure 2). The Organisation of Petroleum Exporting Countries (Opec) raised its formal output ceiling by 500,000 barrels per day (b/d) to 27.5 million barrels per day in mid-March to pump up second-quarter global stocks, creating a cushion for anticipated year-end demand. But some analysts feel that Opec capacity is only one million b/d away from their limits, adding to doubts that supplies will be able to react to increased demand and potential outages.

Also contributing to price gains, the dollar – the global oil trade currency – continued its first-quarter retreat from a recent high against the yen. However, at this level it is still well above its low mark of a year ago. The weaker dollar has encouraged many funds to move money from treasury markets into commodities, while also protecting non-dollar economies from the effect of higher crude prices.

Market outlook analysis

Adding even more fuel to the fire, investment bank Goldman Sachs – one of the biggest traders of energy derivatives – has released a research report indicating that crude oil prices could reach prices over \$100 per barrel in the next few years. In its “conservative forecast”, the bank suggests the market is in the early stages of a “super spike period” that may see 1970s-type price surges. Goldman says its predictions are supported by



limited spare capacity in the energy supply chain and the length of time required to produce additional supply.

“We believe oil markets may have entered the early stages of what we have referred to as a ‘super spike’ period – a multi-year trading band of oil prices high enough to meaningfully reduce energy consumption and recreate a spare capacity cushion only after which will lower energy prices return,” Goldman’s analysts write.

Oil would have to hit about \$80 a barrel to top the levels seen during the oil crisis of the late 1970s, adjusted for inflation. Nonetheless, the comparison brings memories of how high energy prices threw the world into recession, and triggered several years of declining oil demand.

Correlation

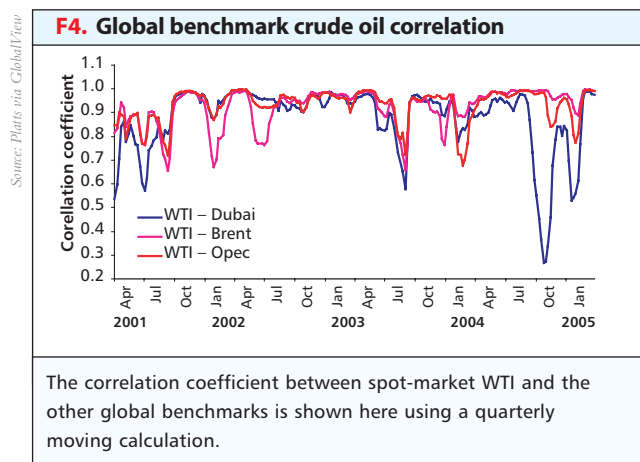
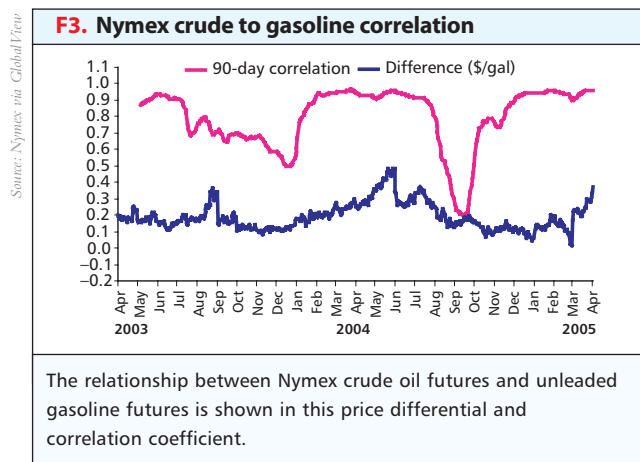
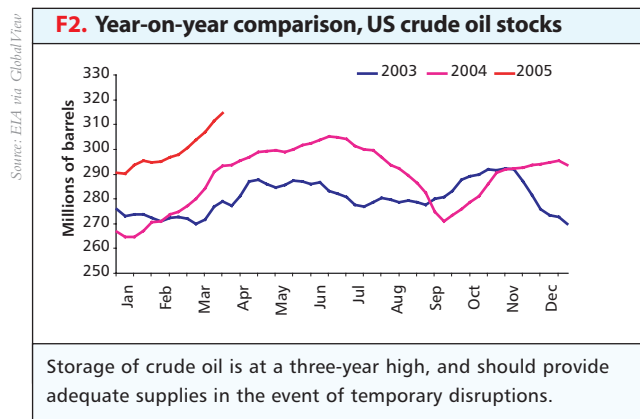
With the high level of activity and volatility in the markets, traders look for opportunities where elements of the petroleum markets are not changing at the same rate. One calculation used for analysis of the relationship between two data series is correlation. The correlation coefficient measures the degree to which the value of one variable increases as the value of the other variable increases; and as one decreases the other decreases.

The coefficient measures the strength of the relationship in a range from 0 to 1. A coefficient value of 1 means that the two series are completely correlated, with a value over 0.9 demonstrating reasonably strong correlation.

Here, we first examine the relationship between Nymex gasoline and crude futures. In figure 3, we observe the correlation between the Nymex West Texas Intermediate (WTI) crude futures and unleaded gasoline futures. For this calculation, we use a moving correlation with a period of one calendar quarter. If we chose simply to calculate the correlation over the entire period, we would see a value of 0.92 and find a fairly strong correlation. On the same figure, we plot the difference in price between the gasoline and crude in dollars per gallon. While the difference ranges between \$0 and \$0.50, the correlation ranges between 0.2 (almost no correlation) and 0.95 (strong correlation). One can see that the connection between the two, when measured with a frequent interval, is not as tight as might be imagined.

Also of interest is the association among the global crude benchmarks – front-month WTI, Brent, Dubai along with the Opec basket. Using the past four years of prices, we compare WTI to each of the others, yielding strong correlation coefficient values of .97 and higher. However, when the moving correlation of one quarter is applied in figure 4, it is apparent that there are periods where the correlation is significantly weaker. In fact, the range of the coefficient is similar to the gasoline-to-crude calculation.

These studies demonstrate that the correlation coefficient can identify those circumstances in which high differentials are more likely to occur. However, pinpointing when the perception is guiding the market more than the fundamentals is a greater challenge. In spite of seemingly adequate quantities in



storage, the market feels that the gap between current supplies and potential demand is far too small for comfort. It would appear that the most likely element to drive prices down will be to alleviate apparent demand. Unfortunately, few are predicting that scenario in the near future. **ER**

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