Understanding how price relationships fluctuate on a seasonal basis is critical for risk managers. During 2005, two of the longest lasting seasonal patterns in the US oil markets have been turned on their head. *Sandy Fielden* explains the patterns and why they suddenly stopped working this year

Seasonal surprises

★ Although the fine print always makes clear that "past-performance results are not necessarily indicative of future results", one of the most popular energy futures trades of the past 20 years has been the seasonal spread between New York Mercantile Exchange (Nymex) gasoline and Nymex heating oil during the spring. It is well-known that heating oil prices usually go down at the end of every winter, while Nymex gasoline goes up. For example, Great Pacific Trading Company, a commodity futures and options brokerage, stated in 1996 that "historically, the price of the Nymex May unleaded gasoline futures tend to outperform the Nymex May heating oil contracts from February 13 to March 31".[1]

Here's how it works. A trader buys a May unleaded contract on or around February 13 and on the same day sells a May heating oil contract. On March 31, the trader sells the unleaded contract and buys the heating oil to close out the position. If heating oil prices fall and unleaded prices rise while the trade is on, it would be profitable. Between 1985 (the first time it was available) and 2004, this trade was a winner 18 out of 19 times.

Why is the trade so reliable? The largest demand for heating oil in the US comes from residential heating. As temperatures warm coming out of the winter months, heating oil prices relative to unleaded gasoline normally decline as demand for heating is reduced. While spring heating demand falls, refiners are busy getting ready for the summer 'driving season' when demand for gasoline increases as families across the US go on vacation. Expectations of higher demand for gasoline lead to higher prices in the spot and futures markets. The crossover between heating and driving seasons provides the trading opportunity.

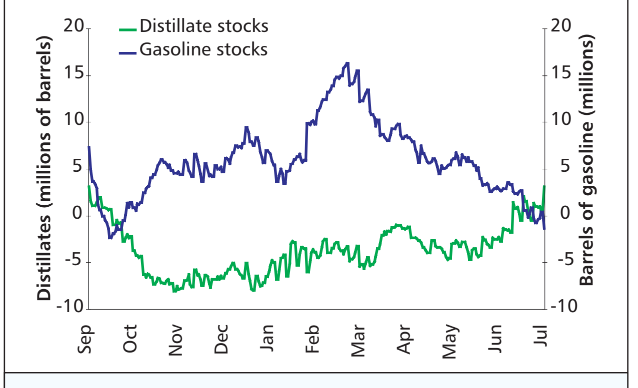
The second seasonal pattern is that of Nymex heating oil prompt futures being less expensive than unleaded prompt futures from April to July.

During the summer months from April to July, risk managers and traders normally expect Nymex heating oil futures for prompt delivery to remain less expensive than prompt Nymex gasoline. Prompt-month prices for Nymex unleaded gasoline exceeded Nymex heating oil every year from 1985 to 2004 between April 1 and July 15 (see figure 1). This trend often

F1. Seasonal average Nymex unleaded vs Nymex heating oil, 1985–2004

The first year heating oil and unleaded gasoline were both traded on Nymex was 1985. For the next 19 years, unleaded prices were higher than heating oil from April through July – the US 'driving season'. Warmer weather reduces demand for heating oil and consumers take vacations and drive more. Gasoline price premiums over heating oil reflect the higher demand for gasoline.

F2. 2004–2005 gasoline and distillate stocks versus five-year averages



When compared with their five-year averages during 2004–2005, distillate stocks were nearly always relatively low, while gasoline stocks were higher than usual. This underlying fundamental helped reverse usual market psychology coming out of the winter so that heating oil prices responded to perceived shortages by increasing at a faster rate than gasoline.

continues until the end of September when the driving season ends and winter expectations start to influence heating oil prices higher again.

This summer, seasonal pattern has a large influence on risk management in the heating-oil market. The north-east is the biggest market for home heating oil in the US. The concept of energy price risk management may be said to have been 'invented' by New England homeowners filling up their heating oil tanks during the summer months. By taking advantage of lower prices when thoughts of cold weather are far from the minds of traders, they are hedging against the risk of unreasonable prices during the winter when cold temperatures cause price spikes. Nowadays, homeowners lock in futures prices for winter delivery during the summer months, since heating oil distributors offer customers fixed price deals for the winter without the inconvenience of buying the fuel months in advance of when they use it. These strategies rely on lower heating oil prices during the summer months.

What was different this year and why?

During 2005, trading the seasonal spread between May unleaded and heating oil contracts from February 13 to March 31 would have resulted in an uncharacteristic loss. The May Nymex unleaded gasoline to heating oil spread closed at 13.9 cents per gallon on February 14, but by 31 March it had narrowed to 4.7 cents – lower by 9.2 cents per gallon. Trading one contract would have resulted in a notional loss of $3,864 dollars. During the last 20 years, the trade has only been a loser one other time – in 1992 when a 1.57 cent loss would have cost a trader $659.

The period from February 14 to March 31, 2005 was one of rising oil prices in general. In response to higher world demand for oil and concerns that Opec might reduce production for the second quarter to prevent over-supply, front-month Nymex crude prices rose by $7.96 a barrel. Nymex May heating oil and unleaded both increased significantly over this period. However, although May unleaded prices rose by nearly 28 cents a gallon, May heating oil prices rose even further, by 37 cents a gallon. The faster pace of heating oil prices eroded the expected seasonal premium for gasoline and turned the seasonal spread trade pattern on its head.

The main reason for heating oil prices to rise faster against the trend coming out of winter was that stocks of distillates (the group of refined products from the middle of the crude barrel, of which heating oil forms the bulk) were abnormally low at the same time that gasoline stocks were tracking close to their upper limits (see figure 2). In addition, winter in the north-east US this year was colder than usual. Over the February 14 – March 31 period, low temperatures in New York City were below 30-year norms 60% of the time.[2] As a result, the market discounted the usual seasonal rise in unleaded prices and placed a premium on heating oil.

An abnormal trend in heating oil prices coming out of the winter in 2005 was not an entirely unprecedented event, but the continued strength of heating oil prices through the end of July, and the relative weakness of unleaded gasoline, was. Reversing the previous 20-year trend, prompt Nymex heating oil prices were higher than unleaded during most of June and part of July 2005 (see figure 3).

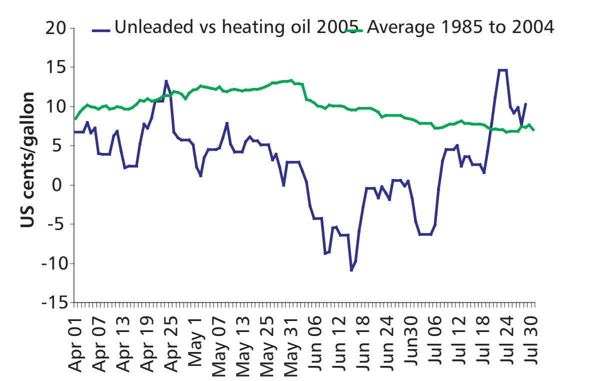
Unusual strength in distillate prices through the summer of 2005 is explained by four fundamental factors. First, a tight supply situation in distillates continued from winter until early July. Although inventories built rapidly in May, June and July (see figure 4), they did not reach five-year norms until July.

Second, the world market for distillates and particularly for low-sulphur diesel was very strong. Diesel is very similar to heating oil in make-up, but low-sulphur diesels manufactured to meet more stringent environmental standards require more complex refining. New low-sulphur diesel requirements in Europe at the start of 2005 and in India in June strained refinery capacity. Booming demand for oil in Asia, particularly China, was led by distillates, which are used twice as much as gasoline there. Asian markets mopped up excess product from Middle-East refineries that normally heads west, causing tight supply in Europe. The IPE gasoil crack (the spread between gasoil – which is the same as heating oil – and Brent crude) reached an all-time high on June 14, 2005 at $17.29. Gasoil prices in Singapore hit an all-time high on July 7 of $73.89 a barrel.[3]

Third, in the US, refinery turnarounds in the first quarter and plans for revamping diesel treatment units ahead of new ultra-low-sulphur diesel specifications that come into effect in 2006, slowed the return to full inventories and increased the concern that winter 2006 stocks would not be adequate. Refiners finally woke up to price signals to produce more distillates in July. The heat crack (the spread between Nymex heating oil and Nymex crude) averaged $1.73 more than the gasoline crack (spread

Source: Nymex

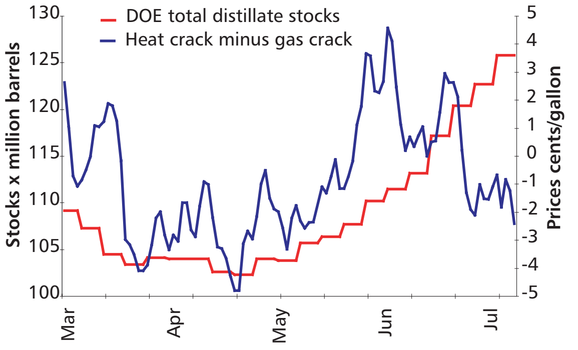
F3. Nymex unleaded vs heating oil 2005



This chart shows the same seasonal average of Nymex prompt unleaded gasoline over Nymex prompt heating oil as figure 1, but overlays the performance of the spread during 2005. Gasoline prices fell below heating oil in June and July for the first time in the 20-year history of the spread in response to higher worldwide demand for distillates.

1. *(see http://www.gptc.com/resrch/unleaded.htm).*
2. *Source: National Oceanic Atmospheric Administration*

F4. Distillate stocks and Nymex heat crack premium



The heat crack premium shows how much money a refiner would make from the spread between Nymex heating oil and crude versus that of unleaded gasoline and crude. The chart shows making gasoline was more profitable (negative heat crack premium) from March to May. In June and July a positive heat crack premium encouraged higher distillate production and stock building.

Source: US Department of Energy, Nymex

between Nymex unleaded and Nymex crude) during June 2005 (see figure 4). This made producing distillates more profitable for refiners. By July 12, refiners pushed their plants to 98.1% utilisation with distillate production reaching 26.9% of output – a level normally seen only in winter.[4]

Fourth, early-season hurricanes in June and July threatened US crude production, compounded the refined product supply fears and boosted distillate prices, just when new production finally came into play. When a distillate stock build of 1.3 million barrels was announced by the US Department of Energy on June 8, the result was a drop of 4.8 cents a gallon in front-month Nymex heating oil. The very next day, with tropical storm Arlene bearing down on the Gulf of Mexico, Nymex heating oil prices jumped back up 7.28 cents a gallon to $1.6256 a gallon. Potential damage to drilling rigs and the threat of closure to the giant Louisiana Offshore Oil Port (LOOP) crude import facilities in the US Gulf often causes prompt Nymex prices to rise as tropical storms approach. On July 6, Nymex prompt heating oil settled at an all-time-high of $1.779 a gallon with two tropical storms on the way (Cindy and Dennis).

While these abnormal conditions in the distillate market can be explained by fundamental data, they demonstrate that the oil market passed into a new equilibrium this year. The tightness of supplies worldwide turned normal seasonal patterns upside down. Risk managers should take note of the consequences in their modelling of price relationships. ER

3. Source: Platts
4. Source: US Department of Energy

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